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Publication in IJHE provides wide exposure to journal articles and adds to the professional literature base of the field. Theoretical papers, literature reviews, and a wide range of genres along with research papers are invited for publication in the journal. As editor, I strongly encourage submissions to the journal. The papers included in this issue of the journal represent a diverse range of genres but share a common thread—a strong link to enhancing wellbeing.

The next issue of the IJHE will include a selection of the best refereed papers presented at the IFHE XXII World Congress focusing on Global Wellbeing which was held in Melbourne, Australia from 16-21 July 2012.

As always, the articles have undergone rigorous, double-blind review, and are adding to the professional literature base of the field.

Professor Donna Pendergast, PhD
Editor, IJHE

A framework for investigating spiritual health and wellbeing in Home Economics

Jay Deagon, Donna Pendergast

Griffith University

Abstract

Spiritual health and wellbeing are accepted as foundations of Home Economics and health education, yet they remain elusive in terms of conceptualisation. This paper explores synergies between Home Economics and contemporary health and education literature to provide a new and unique perspective for exploring spiritual health and wellbeing in research and practice. The purpose of this work is to clarify spiritual concepts so that home economics professionals might have a framework for better understanding taken-for-granted foundations of the field.

Keywords: spiritual health and wellbeing, home economics, social enactment, sustainable development, diversity

Informing literature

‘Spiritual health and wellbeing’ is a phrase often used in the field of health and home economics, yet it is an elusive, slippery concept. Professionals may be unaware when they read the words *spiritual*, *spiritual health* and *wellbeing* in health and education policy and literature the extent to which the terms (intended or unintended) convey with them an extraordinary amount of diverse, yet taken-for-granted meaning. As an internationally recognised curriculum subject, home economics offers a unique and multidimensional platform (Walker, 1971) from which to study spiritual health and wellbeing, and the subsets of this phrase. The purpose of this article is to clarify how spiritual health and wellbeing is positioned within home economics by developing a diverse and inclusive framework for use in home economics research and practice.

Various terms and concepts convey similar meaning

There is considerable issue with the number of terms that are used within the field to describe and define similar health outcomes for people. A search of the literature from within the fields of home economics, education, health education, public health and health promotion finds many different terms that convey similar notions. To illustrate how terms vary, an Australian education example can be taken from the *Melbourne Declaration on Educational Goals for Young Australians* (December 2008) (MCEETYA, 2008) where the terms *spiritual development and wellbeing* (p. 4), *spiritual wellbeing* (p. 9) and *the spiritual dimension of life* (p. 13) are all used as aspects for consideration in the overall goals for teaching and learning in Australian schools. These are separate concepts with similar intent. It is understandable that educators may become confused.

Furthermore, within the selected literature reviewed, other terms and concepts used include holistic health, spirituality, spiritual health, spiritual wellbeing, (Bensley, 1991; Fisher, 2008; Hawks, 2004), the spiritual health dimension (De Souza, 2006; Hettler, 2009; McGregor, 2010; O'Connell & Skevington, 2007), spiritual intelligence (Hyde, 2004), spiritual literacy (Burrows, 2006; Watson, 2006), spiritual development (Crossman, 2003; Hill, 1989; Petersen, 2008; Roehlkepartain, Benson, King, & Wagener, 2009), wellbeing, wellness, the human condition (Fisher, 2008; Henry, 1995; McGregor, 2010), happiness, harmony, meaning and purpose in life, quality of life (Baldwin, 1996; World Health Organisation, 1946, 1998), connectedness, supportive environments (Chuengsatiansup, 2003; Crawford & Rossiter, 2006; De Souza, 2009; Hawks, 2004; Hyde, 2004; McGregor & Chesworth, 2005; World Health Organisation, 2011) and so forth. Each of these terms and concepts has its own internal arguments, underpinning bodies of knowledge and championing authorities.

Taking this diversity into consideration, hyper-specialisation holds dangers. Within these fields of literature, however, the terms and concepts generally stem from the same pragmatic purpose. Home economists, social scientists, and educators who work with people are investigating and acknowledging the intricate ways that human life intertwines on the planet and the delicate balances needed to ensure sustainable human existence (Delors, 1996; Raskin, 2008; World Health Organisation, 1946). Therefore, for this paper, *spiritual health and wellbeing* is used as the centrally organising construct because it encompasses many of these current ideologies that are informed by existing theory. Furthermore, this triadic concept (that is, spiritual, health, wellbeing) is a culmination of suggested terminology used within home economics (McGregor, 2010; McGregor & Chesworth, 2005). As an overarching concept, using spiritual health and wellbeing as a whole construct has the potential to unite these three fields of research into human and planetary health (Chuengsatiansup, 2003; Fisher, 1998, 2008; Hawks, 1994, 2004; Hawks et al., 2007; McGregor, 2010; Varder, 2006). *Spirituality* and *the spiritual health dimension* are also used as general terms in this article. The next task is to set out how to conceptualise spiritual health and wellbeing so that we can then move to its positioning within home economics contexts.

Positioning the issues: Spirituality, religion, globalisation and technology

Educators may read about spirituality in official policy or unofficial literature only to gloss over it with *Apathy, Acrimony or Accord* (Hill, 1989). Depending on the reader's underpinning assumptions, this may inadvertently devalue its purpose or aim within the context in which it is written. By way of an Australian education example of this uncertainty in terms, Crawford and Rossiter (2006) note that:

... for many educators, the terms [spiritual health and wellbeing, spiritual development, the spiritual health dimension] are obviously significant, but still somewhat ambiguous as regards their relevance to public education. This is because spiritual and moral development have not yet been conceptualised clearly enough to be accepted as more than a nominal goal (p. 13).

Spiritual health and wellbeing is a complex notion. Spirituality in health and education has a history of inciting passionate and divisive argument. Discussion can swing from reticence to strong opinion. Yet, if the concept remains differentially understood and endorsed, human spirituality and its relationship with education and the human condition will remain tenuous. One reason for the challenge of understanding and adoption is the possible connection between traditional religion and spirituality. For the purposes of this discussion, there are distinct differences between these concepts. An emphatic distinction between spirituality and religion is necessary “not to discredit one and privilege the other but rather to provide a context for a discussion of spirituality and education that is not confused by the discussion of religion and education” (Burrows, 2006, p. 3). Within the proposed framework presented in this article, religion is situated within communal and transcendental aspects of human experience. This will be discussed at various points within this paper. Significant concepts such as religion cannot be ignored in social science, but rather need to be respected, rendered accessible and applicable to all human participants, socially and culturally diverse and inclusive of all and any belief systems.

Globalisation and technology are substantially identified as having major impacts on understandings of spirituality in health and educational contexts. Impacts are occurring across secular and government-funded schools, religious and non-religious institutions within western and eastern cultures (Best, 2000; Crossman, 2003; Deagon, 2009; Fisher, 2001; Fleming & Evans, 2008; McGregor & Chesworth, 2005; Nickols et al., 2009; Wong, 2005). Spiritual concepts in education can mean many different things (Fisher, 2008; Hill, 1989; McGregor & Chesworth, 2005; Tacey, 2003). Furthermore, multiculturalism also impacts on understanding the term spiritual within local, national and international contexts (Agnello, White, & Fryer, 2006; De Souza, 2006; Organisation for Economic Co-Operation and Development, 2001; Watson, 2006; Yates & Young, 2010). As a result, specialised content knowledge contained in curriculum or policy may not be easily interpreted or amenable to all situations. We need a clear direction to ensure that interpretation is trustworthy, and not misunderstood, glossed over or ignored.

To illustrate historical and hegemonic influences, spiritual concepts may once have been more simply understood and interpretable within societies governed by a dominant religious or political agency, for example, patriarchal, primarily Christian, postcolonial, British-ruled Australia (Hickling-Hudson, 1999; McGregor, Pendergast, Seniuk, Eghan, & Engberg, 2008; Nickols et al., 2009; Pendergast, 2001). However, because of the contemporary capacity to move people across national and international borders (geographic and conceptual), access to unrestricted information and opinions on the Internet, together with an awakening of social conscience about respecting and embracing the diversity of different cultures (Delors, 1996), people may have considerable difficulty accommodating and comprehending the vast array of new and complex meanings of the way the word spiritual is being recontextualised.

Recontextualisation is an important concept because it explains how spiritual concepts produced in ‘the real world’ (for example, dominant discourses on religion, or nursing

terminally ill cancer patients or 'new aged' spirituality) are altered for specific purposes by specific audiences (Gee, 2005; Tacey, 2003). Singh (2002) explains that:

... a discourse is moved from its original site of production to another site, where it is altered as it is related to other discourses. The recontextualised discourse no longer resembles the original because it has been pedagogised or converted into pedagogic discourse (p. 573).

Singh (2002) is specifically referring to education but this knowledge has been recontextualised here to apply to a home economics site. However, *the rules* still apply. Recontextualised knowledge is synthesised, manipulated, politically compromised and individually expressed until it has been altered from its original source *and* possible meaning or intent. Generalised meaning may still apply but because knowledge has been recontextualised to apply to contemporary discourses its meaning may become obscured. It was necessary to seek clarification from *the real world* (for example, the United Nations) and examine overarching policy to see where in practice human spirituality was included and why.

Rationale for situating spirituality within global population health

The framework for spiritual health and wellbeing constructed and presented here directly addresses the United Nations' (UN) Decade for Education for Sustainable Development 2004-2014 (ESD) directive. The United Nations Educational Scientific and Cultural Organisation's (UNESCO) goal is to "help people to develop the attitudes, skills and knowledge to make informed decisions for the benefit of themselves and others, now and in the future, and to act upon these decisions" (UNESCO, 2009, para 3). The International Federation for Home Economics (IFHE) make a similar call to action and state that the purpose of home economics is "to achieve optimal and sustainable living for individuals, families and communities" (IFHE, 2009, p. 1). If we are to develop the skills, attitudes and knowledge to achieve optimal and sustainable living for all people, then this urgent call for "mass social learning" (Sterling, 2004) asks us all to (re)consider what it means to be a human being living on the planet Earth. How is spiritual health and wellbeing to be positioned within this directive? This paper maps the knowledges that provide a rationale that draws spiritual health and wellbeing into a more comprehensive picture of health and education. By examining the reasons why spiritual health has been neglected as a research subject this paper proposes ways to move forward.

In health education, the most widely acknowledged model for understanding holistic health and wellness is Dr Bill Hettler's Six Dimensions of Wellness model, represented as a hexagon covering social, intellectual, spiritual, occupational, emotional and physical health (Hawks, 1994; Hettler, 2009; McGregor, 2010). In later years Hettler (2010) added an environmental dimension to his model and on his website he reflects:

[O]ne of the common modifications to my original hexagonal model is a seven dimensional model in which the environmental focus, which was always part of the social dimension, has been added to the original six as a separate dimension... years ago, I proposed that the environment is so important to the

survival of all species that we should really create a six dimensional model focused on the environmental wellness of the planet.

Contrary to Hettler's altruistic vision of holistic health and wellness of whole persons, families, communities and the planet, past separations of *health* into *dimensions* has left a wide gap or lacuna in research into spiritual health and wellbeing (Hawks et al., 2007, p. 3). Hawks and colleagues (2007, pp. 2-3) report that in a six-year period from 2000 to 2006 only 1% of academic literature referred to spiritual health as opposed to 79% of research attention on physical health. This stark contrast has been attributed to the biomedical model of health and its ease of measurability which dominates health literature (Hawks, et al., 2007). The more measurable may drive out the more meaningful.

Science and disconnection are the important concepts here. In the past science has been mistaken as the genus rather than as a species of research. "Science, as the vehicle through which to investigate and explain existence over the last four hundred years, disconnected humans from their natural, holistic, and spiritual belonging" (Agnello et al., 2006). Crawford and Rossiter (2006) make the observation that scientific practices have reduced the human being into measurable packets of knowledge to the point where we have lost sight of natural, holistic and spiritual knowledges.

Power and control

Rabinow and Rose (1994) compiled and edited a collection of Michel Foucault's (1926-1984) *Essential Works* between 1954 and 1984. Using their book as a reference, essential ideas have been synthesised to give a brief overview of why Foucault's philosophy is pertinent to this paper. Foucault provides a method for exposing how events and philosophies continue to influence human spirituality in contemporary society. Specifically useful for this paper is Foucault's belief that, through the centuries, politics and religion have exercised power to structure and control population health and education systems (Foucault, 1974 as cited in Rabinow & Rose, 1994). Foucault suggested that these governing bodies played a significant role in directing population health and education interventions (Foucault 1974, 1978 as cited in Rabinow & Rose, 1994).

According to Foucault, medicalisation of the human condition was necessary for both individual and population health because standardisation in measurement and observation could then fix social health issues. These measurement and observation methods reduced human health issues into categories of "fixable problems". Importantly, Foucault recognised then, that now is the time to synthesise knowledge that is available to us through contemporary means and put whole human beings back into their relative contexts.

Accordingly, there has been a shift away from compartmentalised versions of health. New ways of assessing health that include the spiritual health dimension as a population health phenomenon are now being investigated (e.g., Chuengsatiansup, 2003). The World Health Organisation (WHO), for example, recognises that *health* takes place in a wide variety of contexts. The spiritual health dimension caught the attention of the WHO for its potential to empower and motivate individuals, families and communities into addressing health inequities by specifically targeting the *spiritual* needs of populations (Varder, 2006). This

present paper uses WHO's definition of health as "a state of complete physical, social and mental wellbeing, and not merely the absence of disease or infirmity" (WHO, 1946, p. 1). Use of the phrase "a state of complete... wellbeing" is often criticised for its narrow informing view and unattainable ideological aims. However, this still remains the WHO's definition and for this article, "a state of complete... wellbeing" denotes a holistic vision of health.

The WHO also acknowledges that the spiritual health dimension is increasingly recognised as an important part of holistic good health (WHO, 1998, p. 1). As contained within the WHO's *Health Promotion Glossary* (1998), the spiritual dimension is considered a part of the "personal beliefs domain" to "quality of life." Quality of life is defined as an:

...individual's perceptions of their position in life in the context of the culture and value system where they live, and in relation to their goals, expectations, standard and concerns. It is a broad ranging concept, incorporating in a complex way a person's physical health, psychological state, level of independence, social relationships, personal beliefs and relationships to salient features of the environment. (WHO, 1998, p. 17)

There are six domains recognised in this quality of life definition. They are physical (e.g., energy, exhaustion), psychological (e.g., self-efficacy, positive or negative feelings), level of independence (e.g., freedom of movement, mobility, co-dependency), social relationships (e.g., inclusion in positive social support), environment (e.g., accessibility to health care, geography, sustainability and pollution) and finally personal beliefs/spirituality (e.g., meaning in life). The WHO Constitution asserts that there are nine principles that are "basic to the happiness, harmonious relations and security for all peoples" (WHO, 1946, p. 1). Of particular interest to this paper are the first two principles; namely, the definition of health as discussed above and the second principle that states "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition". By extension, the WHO is acknowledging that the spiritual health dimension is distinct and separate from religion, but still an important aspect of the health of all peoples.

Finding ways that spirituality can inform population health assessment, Chuengsatiansup (2003) writes "spirituality is an emergent property of a complex living system and exists only when such a system is examined in a holistic manner" (p. 3). Quality of life and human spirituality are intricately and inseparably connected to holistic human health (Baldwin, 1996). For this reason, many organisations are being deeply challenged to research ways to *rebalance* human beings with themselves, each other and the planet and to recognise the impacts of their actions within larger realities and global consequences. This captures the *essence* here of spiritual health and wellbeing.

Spiritual health and wellbeing: breaking down a complex construct

To organise the framework into manageable packages of knowledge, Fisher's (1998, 2008) four domains model and Deagon's (2009) three Discourse models provide the conceptual framework for understanding the whole construct of spiritual health and wellbeing. Juxtaposed with the *essence* of meaning referred to above, simply, spiritual health and

wellbeing considers the quality of relationships a person has with themselves, others, the living and non-living environment, and a transcendental other or acknowledgement of a larger reality or set of realities (De Souza, 2009; Fisher, 2008).

Fisher's four domains model of spiritual health and wellbeing

Developed across twenty years' studying Australian and British primary school, high school and university populations, Fisher's (1998, 2008) four domains model (See Figure 1 below) categorises these relationships into personal, communal, environmental and transcendental. *Progressive synergism* is proposed by Fisher (1998, p. 28) to explain the interrelationships between these domains as a means of understanding that spiritual health and wellbeing is developed over time and with life experience. As an individual develops within each domain the next domain is embraced. Caution must be taken with this notion because it does not claim to provide an absolute explanation of development for every individual. Fisher (2008, p. 13) clarifies this point as follows:

[W]hen relationships are not right, or are absent, we lack wholeness, or health; spiritual dis-ease can grip our hearts. The quality of relationships in each of the domains will vary over time, or even be non-existent, depending on circumstances, effort and the personal worldview and beliefs of the person.

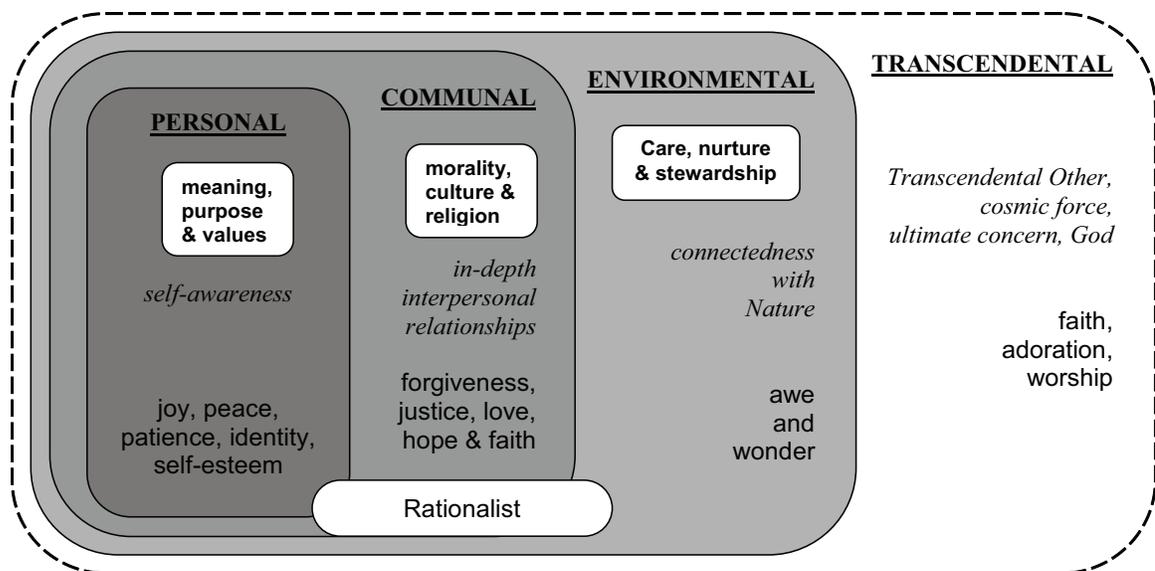


Figure 1: Fisher's (1998, p. 28; 2000, p. 40; 2008, p. 12) four domains model of spiritual health and wellbeing that represents spiritual health expressed by an individual as they move in, across and between each domain of wellbeing represented as a process of progressive synergism. Used with permission.

The personal domain refers to self-knowledge. The process of developing self-awareness affects values, personal identity, meaning and life purpose. The communal domain refers to how an individual relates to and interacts with other human beings. The environmental domain refers to an awareness of other living creatures and non-living environments and includes a sense of awe and wonder in the natural world. The final domain is the transcendental domain. Transcendence is defined by Fisher (1998, p. 191) as meaning 'a relationship with some-thing or some-One beyond the human level' and includes 'the universe as a source of Mystery'. Conceptualising spiritual health and wellbeing into these four domains provides a balanced framework that does not lean towards any specific religious or belief systems but that takes into consideration the multifaceted nature of health (Fisher, 2000, 2008). Religion and all other belief systems are engulfed within the communal domain (Fisher, 2008). This is important because using this framework to categorise spiritual health and wellbeing may be applied cross-culturally and across many different geographies, contexts and social situations.

Within the education and health academies specialising in the *spiritual health dimension*, *child and adolescent spiritual development* and *spiritual wellbeing* it is generally accepted that *spiritual* is not synonymous with *religious* (Crawford & Rossiter, 2006; Crossman, 2003; De Souza, 2006; Hawks, 1994; Hawks, et al., 2007; Tacey, 2003). According to Hill (1989) spirituality presupposes religion. Religion can be encompassed within dogmatic, faith-based and communal aspects of spirituality (Crawford & Rossiter, 2006; Fisher, 2008; Tacey, 2003). Religion cannot exclude notions of spiritual; however, spirituality is not dependent upon religion to give it meaning. Therefore, spirituality may be considered as an individual or existential concept whereas religion is a socially constructed artefact.

Synergies between home economics and spiritual health and wellbeing

Spiritual concepts informed home economics as early as 1902 at the Lake Placid conference (McGregor, 2010c, p. 12). Since then, human spirituality, the spiritual dimension, spiritual health, spiritual wellbeing and spiritual wellness have entered home economics rhetoric (Henry, 1995; McGregor, 2010c; McGregor & Chesworth, 2005; Nickols et al., 2009). However, library and databases searches reveal that there is minimal secularised education literature and even less home economics-specific evidence-based research on the concept of spiritual health and wellbeing. While the whole concept remains elusive, both Henry (1995) and McGregor (2010c) believe that spiritual health and wellbeing is worthy of research attention because of its implications for understanding a holistic approach to health and the human condition.

Context is crucially important. The ways of interpreting spiritual concepts will vary from reader to reader and it is therefore important to give due consideration to situated meaning (Gee, 2005). This article is situated within a home economics context. As a curriculum subject, home economics is a vital "hands on" subject that develops valuable life-long learning attributes (Ma & Pendergast, 2010). There are valuable harmonies between home economics and spiritual health and wellbeing. Figure 2 represents these synergies and is adapted from key concepts contained in the IFHE Position Statement (2008) together with a simplified version of Fisher's (1998, 2008) four-domains model for conceptualising spiritual health and wellbeing.

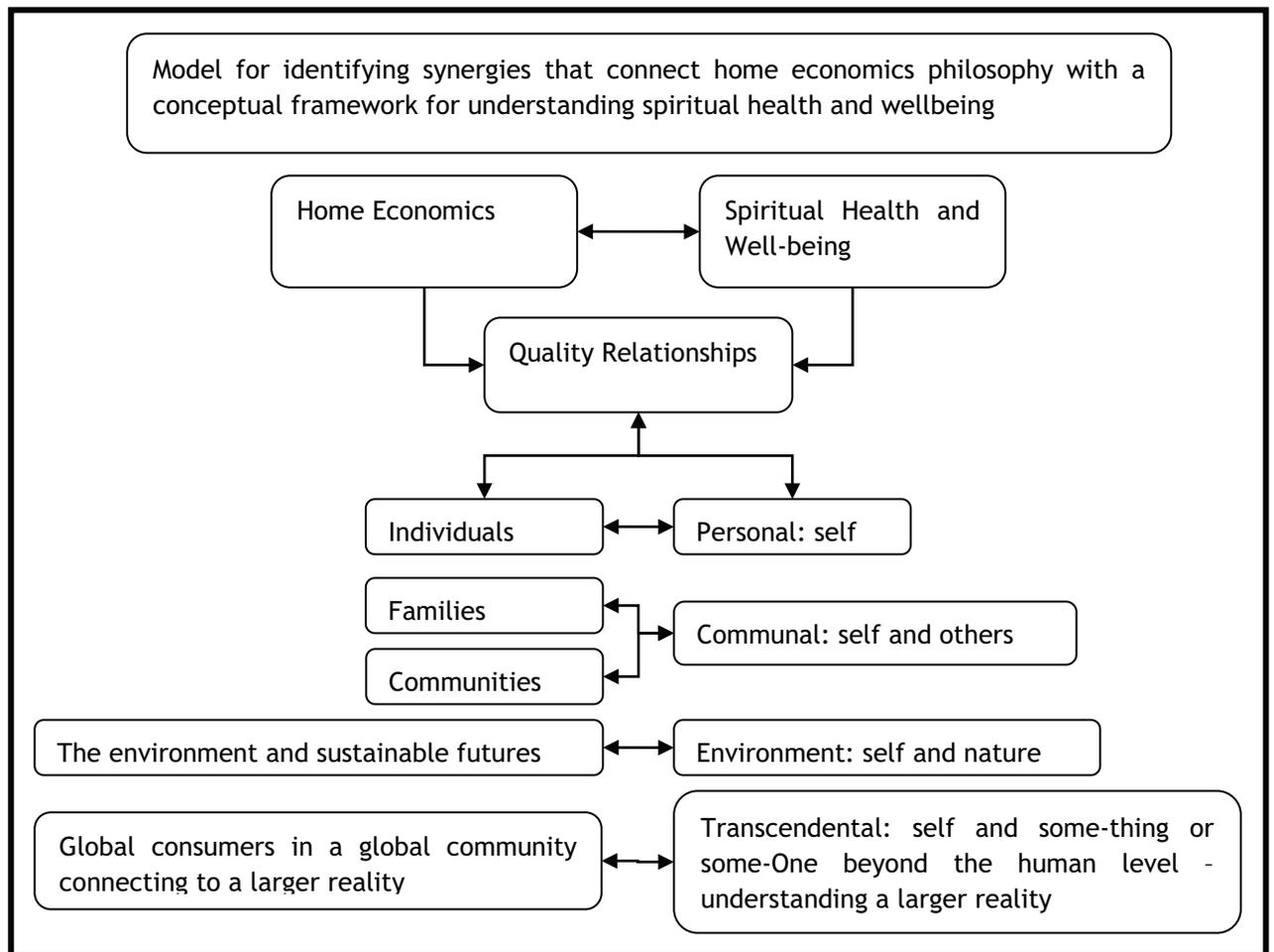


Figure 2: Synergies between home economics and an adapted summary outline version of Fisher's (1998, 2008) conceptual framework for spiritual health and wellbeing

The IFHE (2009, p. 1) position statement clarifies the boundaries of home economics as:

- an *academic discipline* to educate new scholars, to conduct research and to create new knowledge and ways of thinking for professionals and for society
- an arena for *everyday living* in households, families and communities for developing human growth potential and human necessities or basic needs to be met
- a *curriculum area* that facilitates students to discover and further develop their own resources and capabilities to be used in their personal life, by directing their professional decisions and actions or preparing them for life

- a *societal arena* to influence and develop policy to advocate for individuals, families and communities to achieve empowerment and wellbeing, to utilise transformative practices, and to facilitate sustainable futures.

To give an indication of multidisciplinary and transdisciplinary topics that currently inform home economics practice around the world, Table 1 below (entitled *Identifying the scope of projects available to students applying home economics curriculum, practices and principles demonstrating the significant contributions from interdisciplinary fields of knowledge*) represents a selection of bodies of knowledge and topics available to home economics students worldwide as they relate to common curriculum, practices and principles. This is not an exhaustive but an indicative list of the bodies of knowledge represented in home economics globally (Nickols et al., 2009).

Table 1: Identifying the scope of projects available to students applying home economics curriculum, practices and principles demonstrating the significant contributions from interdisciplinary fields of knowledge

Food & Nutrition	Textiles	Living Environments
<ul style="list-style-type: none"> ▪ food security for all ▪ organics ▪ agricultural practices ▪ quality of life ▪ body image ▪ healthy eating and exercise habits ▪ consumerism ▪ applies a critical thinking lens to media ▪ cookery techniques for the home ▪ how to shop for food ▪ making ethical and economically sound consumer choices ▪ cultural and religious awareness 	<ul style="list-style-type: none"> ▪ ecological sustainable futures for all ▪ child labour law ▪ ethical choices ▪ eco-friendly agricultural practice ▪ technical machinist practices ▪ promotes creativity and aesthetics ▪ chemical awareness used in making textile products ▪ recycling ▪ cultural and religious awareness 	<ul style="list-style-type: none"> ▪ human development and relationships ▪ practical home making awareness ▪ community partnerships ▪ family studies ▪ early childhood ▪ relationship and conflict management ▪ peace and cultural studies ▪ economics of the home

Conclusion

Spiritual, health and wellbeing all have scientific and historical baggage. This article should assist in navigating the minefield. Clarifying the concepts may assist with removing the blindfold of religion and with *seeing* how spirituality fits within a more comprehensive picture of health, health education and home economics—all fields that have people as their core of concern. There are many opportunities in which we may observe and explore public expressions of spiritual health and wellbeing. It is the *essence* of spiritual health and

wellbeing theory that may provide us with some direction to address the *mass* sustainability challenges that we face. Home economics curriculum provides a rich platform for this exploration. As we move towards an increasingly interconnected and globalised world, it would be remiss of us to persist with taken-for-granted assumptions about spiritual health and wellbeing in research and practice. The conceptual framework presented in this paper provides an opportunity for us to explore spiritual health and wellbeing from a unique, diverse and culturally respectful platform.

Biography

Jay Deagon, Doctoral Candidate in the School of Education and Professional Studies, Griffith University, Brisbane, Australia, is the founder of HomeEcConnect where she is researching Home Economics and spiritual health and well-being as an aspect of health education, population health and sustainable development. Jay is a member of the IFHE and the Home Economics Institute of Australia and acknowledges the financial assistance provided by the King & Amy O'Malley scholarship fund. E-mail: j.deagon@griffith.edu.au

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Factors associated with attendance of women in antenatal care visit/classes in Ile Ife, Osun State, Nigeria

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Abstract

A cross-sectional study was designed and 150 questionnaires were administered to mothers with children of age 0 to 2 years through random sampling technique in Osun State, Nigeria. Results showed that 62.4% of women had their babies in the hospital. Only 56% had access to antenatal care (ANC); 60.7% started ANC during their second trimester and 87.3% of those that missed ANC did not have good reason. Those that attended clinics for safe delivery were 88.7%. Women were taught adequate diet preparation (98%), hygiene (98%), breastfeeding (96.7%), exercise (88%), and birth control (66.7%) while 99.3% of women changed their eating habits, 6.7% detected complications, and 28% were able to correct their packed cell volume (PCV) results. Factors that influence the attendance of ANC include accessibility to centres, cost duration and facilities availability. Correlation results showed that educational status ($r = 0.334$) and age of mothers ($r = 0.162$) have positive significant relationship with ANC at $P < 0.05$. It is recommended that pregnant women should attend ANC for safe delivery and reduction of maternal and infant mortality and morbidity.

Keywords: women, pregnancy, antenatal care, safe motherhood, Nigeria

Introduction

Childbirth has been described as the woman's struggle. Although pregnancy is a natural process, it is one that is never without risks (Brown, 1995). Pregnancy is one of the most important periods in the life of a woman, a family and a society (Alexandre, Saint-Jean, Crandall, & Fevrin, 2005). There is no way to guarantee that every baby will be born in perfect health, but many infant deaths, pre-term delivery and low birth weights can be prevented by optimizing maternal behaviours that influence health (Beckman, Buford, & Witt, 2000). Education and adequate diet, and early and consistent prenatal medical care maximize the chances of producing a healthy baby (Ministry of Health, 1997).

In recognition of the potentials of care during the antenatal period to improve a range of health outcomes for women and children, the World Summit for Children in 1990 adopted antenatal care (ANC) as a specific goal, namely, "[A]ccess by all pregnant women to prenatal care, trained attendants during childbirth and referral facilities for high risks pregnancies and obstetric emergencies". In developing countries, two out of three women receive some ANC, but in South Asia, excluding China, the rate is barely half (Ministry of Health & World Health Organization (WHO), 2003).

Health services generally consider that ANC begins with a pregnant woman receiving antenatal care that continues until birth (Alexandre et al., 2005). Early ANC was associated with significant improvement in haemoglobin concentration. In Ghana, pregnant women who sought ANC before the end of the 3rd month delivered infants whose birth-weights were significantly better compared to those who sought care later (Kishk, 2002). Studies indicate that the vast majority of Nigerian women who utilize modern ANC registered late, which is in sharp contrast with findings in most developed countries (WHO, 2002).

Many studies have been conducted to examine factors related to the utilization of ANC in middle and low income countries (Banta, 2003; WHO, 2005). Maternal education, household income, parity, women's age and occupation, and cost and availability of services are factors commonly correlated to the use of ANC in these studies (WHO, 2003). The place of residence, urban or rural area, is also a factor affecting the use of ANC. Some studies have shown differences between the urban and rural areas in knowledge, attitude and practices of women towards ANC (WHO, 2002, 2003).

To prevent unwanted outcomes of pregnancy, ANC is the most important method for detecting pregnancy problems in the early period (WHO, 2003). ANC is a critical element for reducing maternal mortality, and for providing pregnant women with a broad range of health promotion and preventive health services (Banta, 2003). One of the most important functions of ANC is to offer health information and services that can significantly improve the health of women and their infants. ANC is also an opportunity to inform women about the danger signs and symptoms for which immediate assistance should be sought from a health care provider (WHO, 2002).

The numbers of ANC visits vary depending on the country. In Western Europe, North America, and many other countries, ANC includes 12-16 visits to health care services by the pregnant woman, as well as provider visits to her home (WHO, 2003). The number of ANC visits varies within Indonesia. WHO and the Indonesian government recommended a minimum of four ANC visits for a woman with a normal pregnancy; that is, one visit each in the first and second trimester, and two visits in the third trimester (1-1-2 frequency). Unfortunately, the actual number of visits does not always reach the recommended number of minimum visits, signalling a need for closer examination of causal factors. Surveys indicated that the 1-1-2 frequency was more likely to be completed by urban women (72%) compared to rural women (57%) (WHO, 2003). Based on WHO statistics (Banta, 2003), only 81% of the women in Indonesia attended the recommended four antenatal visits.

The percentage of pregnant women who received ANC services in Indonesia particularly on the island of Java (1997), receiving at least one visit, was higher (82.3%) compare to islands outside of Java (West Nusa Tenggara, Maluku and Irian Jaya) (65.9%). Half of the women received less than the 1-1-2 frequencies and of those only 60% received the standard care such as measurements of weight, height, blood pressure, weight of womb, tetanus toxin injection and dispensing of iron tablets (WHO, 2005).

A review of studies from various countries indicates that the ANC utilization rate is still low due to many factors that need to be examined, such as socio-demographic features,

knowledge of social support, and ANC services (WHO, 2005). Maternal and child welfare is not only related to health services provided by government and private organizations: it is also related to women as mothers, including their education, economic status, culture, environment, and professional development (Royal College of Obstetricians and Gynaecologists (RCOG), 2003). For example, a study in Xien Khouang Province, Lao PDR (Ndidi & Oseremen, 2010) showed that significant predictors of ANC utilization were level of education, income, knowledge, attitude, distance to service, availability of public transportation, cost of transportation, and cost of services.

There are several factors that may influence attendance at antenatal clinics. Research has identified sociodemographic characteristics, geographic area, attitude towards pregnancy, language fluency, perceived cost, transportation, and childcare as factors and/or barriers related to the initiation of prenatal health services (Beckman et al., 2000). Other research (Ndidi & Oseremen, 2010) revealed that women's understanding and perception of the need for antenatal care can also play a more dominant role. For over 10 years, health services all over the world have been working towards the safe motherhood target of halving the number of women who die each year from pregnancy related causes. Yet there has been little change in the number of deaths or the amount of long-term damage to women's health (Campbell, 2000).

Objectives of the study

- a) Determine the frequency and timing of antenatal care;
- b) Determine women's participation in antenatal care; and
- c) Identify factors influencing the use of antenatal care.

Methodology

Data for this study were collected from 150 mothers with children of age 0 months to 2 years in the study area. The sample was obtained through simple random sampling procedure. The interview schedule, which had been pretested, consisted of two parts. The first requested information on the bio data: age, parity, marital status and setting, and level of education. In the second part, information was collected on mothers' socio-economic characteristics, attendance at antenatal care, care received during antenatal care, and effect of antenatal care on diet, hygiene, breastfeeding, and birth control. Interviews were conducted in Yoruba and English. Data were analysed using descriptive statistics such as frequency counts, percentage and cross tabulation.

Results and discussion

Participants

The age of the 150 women involved in this study, along with their marital status, religion, number of children and age of youngest child, are presented in Table 1. Thirty-six percent of mothers were between the age range of 25-29 years while 28.7% were between the ages of 30-34, and 21.3% fell in the age class interval of 20-24 years; 11.4% of the respondents were aged over 35 while 2.7% were between 15-19 years. This implies therefore, that mothers

within the age bracket 25-29 were mostly involved in the study while those within the age bracket 15-19 were least involved in the study. A very high percentage (87.3%) of the respondents were married, while 12.7% were single parents. The majority (82.7%) of the women were Christians while 16.7% were Muslims and 0.7% were atheists. In terms of number of children, 43.3% of the respondents had one child, 27.3% had two children, 20.7% had three children, while 8.7% had four or more. Finally, Table 1 indicates the age of the youngest child of the women involved in this study: 79.3% of the respondents had babies aged 1-6 months, 16.7% had 7 to 12-month old babies, while 4.0% had 13 to 18-month old babies.

Table 1: Frequency distribution of the respondents' socio-economic characteristics

Variables	Frequency	Percent (%)
Age (year)		
15-19	4	2.7
20-24	32	21.3
25-29	54	36
30-34	43	28.7
35 and above	17	11.4
Marital status		
Married	131	87.3
Single parent	19	12.7
Religion		
Christianity	124	82.7
Islam	25	16.7
Atheist	1	0.7
Number of children		
1	65	43.3
2	41	27.3
3	31	20.7
4 and above	13	8.7
Age of child (months)		
1-6	119	79.3
7-12	25	16.7
13-18	6	4.0

Women's participation in antenatal care

The timing of the first ANC visit, reasons for attending, number of clinics attended and reasons for missing clinic visits are set out in Table 2. Results indicate that 1.3% of respondents' first ANC visit was at the time when pregnancy was more than 27 weeks; for 13.3% the first visit was between 1-11 weeks of pregnancy while for the majority (60.7%) the first visit occurred between 12-19 weeks. The reasons given for attending the ANC clinic were for safe delivery (88.7%), proper monitoring of pregnancy (2%), or both proper monitoring of pregnancy and safe delivery (9.3%).

The majority of the respondents (39.3%) attended 11-15 clinics, 31.4% had 16 and above, 25.3% attended 6-10 classes, while 4% had between 1-5 attendances. The three reasons given for missing ANC clinic were because of sickness (0.7%), social functions (1.3%) or because they are busy at home (10.7%).

Table 2: Percentage distribution of the women's participation in antenatal care

Variables	Frequency	Percentage
Attend antenatal care		
Yes	142	97.3
No	18	12.7
First antenatal care visit (weeks)		
10-11	20	13.3
12-19	91	60.7
20-27	37	24.7
28 and above	2	1.3
Reasons for attending antenatal care		
Safe delivery	133	88.7
Proper monitoring	3	2
Both reasons	14	9.3
Number of antenatal care clinic attended		
1-5	6	4
6-10	38	25.3
11-15	59	39.3
16 and above	47	31.4
Reasons for missing antenatal care		
None	131	87.3
Social function	2	1.3
Sickness	1	0.7
Others (busy at home)	16	10.7

Preferred personnel for antenatal care

Respondents were asked about their preferences for personnel in ANC. The data are presented in Table 3, showing that 58% of respondents indicated that doctors should handle ANC, 33.3% indicated a preference for nurses to be in charge of ANC, 5.3% of respondents chose midwives, and 2.7% stated that all these personnel should handle ANC, while the minority (0.7%) indicated that consultants should handle ANC. For the majority (51.3%), fear was the reason nominated for choosing certain ANC clinics; 40% nominated other reasons (such as proper monitoring of pregnancy), and the reason given by 8.7% was because of complications.

Table 3: Respondents' preferred antenatal care personnel and reasons for preference

Variables	Frequency	Percent (%)
Preferred Personnel for Antenatal care		
Doctor	87	58.0
Nurses	50	33.3
Midwives	8	5.3
Consultant	1	0.7
All	4	2.7
Reason for preference		
Fear	77	51.3
Complication	13	8.7
Other (proper monitoring)	60	40.0

Factors influencing the use of antenatal care

Use of ANC by the women involved in this study was affected by factors including access, cost, and time spent in ANC visits. The impact of these factors is set out in Table 4. More than half (56%) of the respondents said that they had access to antenatal clinics while 44% stated that they did not have access to ANC due to distance. In terms of cost, 36% of respondents paid ₦40 and below to access the ANC clinics, 32% paid between ₦50-₦70 as transportation fares to attend, 12% paid ₦80-₦100 for fares, while 20% of the respondents paid ₦101 and above to attend antenatal clinics. For all the respondents, cost was not considered a major determinant for them to attend ANC.

The duration of ANC visits varied from 1-6 hours: 71.4% of respondents spent 3-4 hours at an ANC clinic, 24.6% spent 1 to 2 hours, while 4% spent 5-6 hours. More than half of the respondents (56.7%) agreed that time spent during ANC clinics is neither too long nor too short; 39.3% indicated that time spent during ANC is too long while a minority (4.0%) said that time spent is too short.

Knowledge acquired during antenatal care

Respondents were asked about the knowledge they gained through their participation in ANC. As Figure 1 illustrates, acquired knowledge related to diet, hygiene, breastfeeding, exercise, and birth control. In terms of dietary knowledge, 98% of the respondents indicated that they were taught about what to eat while 2% indicated that diet was not included in their teaching. The majority of the respondents (98%) indicated that they learned more about hygiene, taking care of their body, their environment and that of the baby, with 2.0% indicating that this was not part of what they were taught. More knowledge about breastfeeding was gained by 96.7% of the respondents, while 3.3% of the respondents did not acquire this knowledge during the ANC. Sixty-six percent of the respondents acquired more knowledge about their health and the relevance of exercise to it, while 12% of the respondents did not partake of this. Knowledge about birth control was acquired by 66.7% of the respondents, while 33.3% of the respondents indicated they were not taught about this.

Table 4: Percentage distribution of the factors influencing the use of antenatal care

Variables	Frequency	Percent (%)
Access to antenatal		
Accessible	84	56
Not Accessible	66	44
Cost to antenatal care		
40 and below	54	36
50-70	48	32
80-100	18	12
101 and above	30	20
Hours spent at the hospital for antenatal care		
1-2	37	24.6
3-4	107	71.4
5-6	6	4.0
Perception on duration of antenatal care		
Too short	6	4.0
Okay	85	56.7
Too long	59	39.3

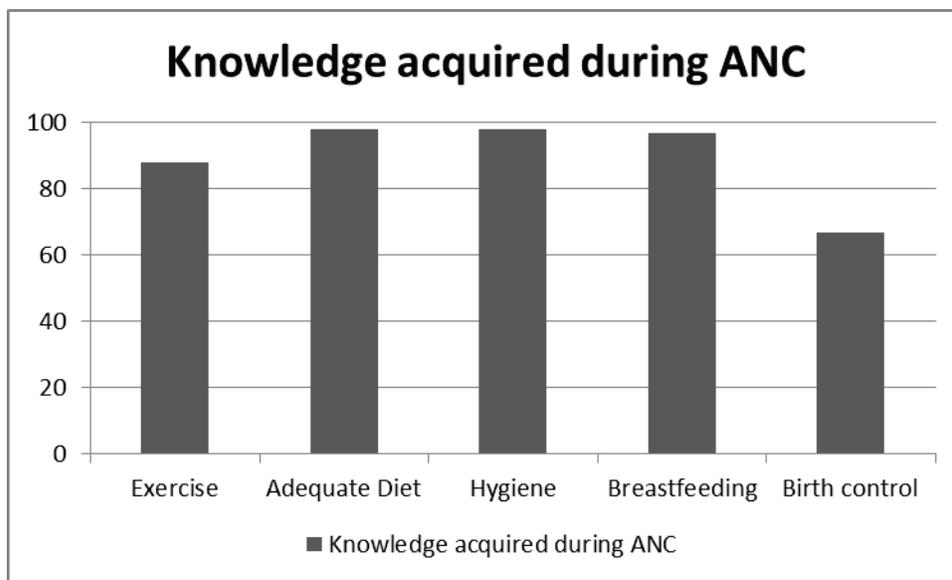


Figure 1: Knowledge acquired by respondents during antenatal care, indicated in terms of percentage of responses

Benefits of antenatal care

Respondents indicated various benefits of participating in ANC, including change of eating habits, ability to detect complications or resolve confusion in pregnancy, and correcting PCV (Packed cell volume, a measure of the proportion of blood volume that is occupied by red blood cells) results. The data are presented in Figure 2. The eating habits of the respondents changed as a result of knowledge gained during the antenatal classes, with 99.3% indicating changed eating habits and only 0.7% of the respondents indicating that their eating habits were not affected. Complications were not detected during ANC for the majority of respondents (93.3%) while 6.7% of the respondents stated that ANC helped to detect complications. Confusion was resolved for 40.7% of the respondents during ANC; 59.3% stated that during antenatal clinic there was no confusion for them. Some of the respondents (28%) had their PCV corrected during ANC while 72% did not have any problem with their PCV (see

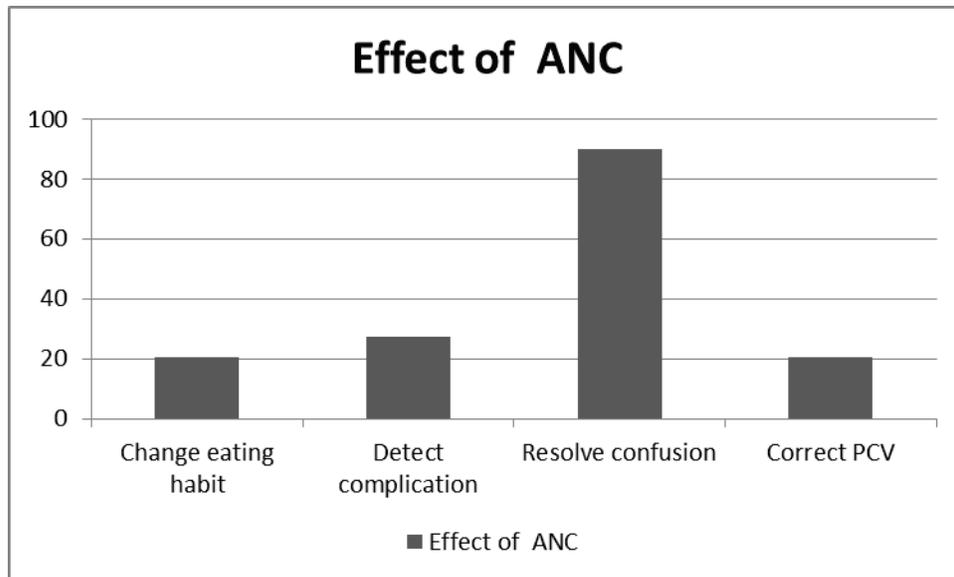


Figure 2).

Figure 2: Effects of antenatal care on changing eating habits, detecting complications, resolving confusion, and correcting PCV, shown in numbers of respondents.

Maternal characteristics and antenatal care

Table 5 sets out the correlation between maternal characteristics (in terms of age, number of children, educational status, and income) and involvement in ANC. As Table 5 indicates, there is a positive significant relationship between age ($r = 0.162$, $p < 0.01$), monthly salary ($r = 0.287$, $p < 0.01$) educational status ($r = 0.334$, $p < 0.01$) and antenatal care, while number of children had a negative significant relationship ($r = -0.374$, $p < 0.01$) with antenatal care. This would suggest that the higher the number of children the respondent had, the lower the number of antenatal care visits because they believed they are experienced mothers.

Table 5: Correlation analysis of maternal characteristics and antenatal care

Variable	Correlation Coefficient (r)	Coefficient of determination (r ²)	Percentage of determination
Age	0.162*	0.026	2.62
Number of children	0.377**	0.140	14.0
Educational status	0.334**	0.112	11.16
Income	0.28**	0.082	8.24

* 0.05 level of significant; ** 0.01 level of significant

Discussion

Early commencement of antenatal care by pregnant women, as well as regular visits, has the potential to affect maternal and foetal outcome positively (WHO, 2002; Yousif & Abdul Hafeez, 2006). Most maternal deaths happen around or during delivery, usually from complications which could have been detected and taken care of if proper care and timely visits were made by women during pregnancy. Some of the pregnant women in the study area did not start ANC visits until the second trimester, and some as late as the third trimester. This is an attitude common with experienced mothers, yet different pregnancies come with different experiences.

Factors that influence the use of antenatal care as discovered by this study are accessibility to care centres, duration of ANC programme in the hospital, facilities available in the hospital and cost of transport to the ANC centres. Yet this study has found that when ANC is accessed, there can be a number of benefits for the pregnant woman and her child. Nutrition is an essential component of prenatal care. A healthy diet contributes to successful pregnancy by reducing complications and promoting adequate foetal growth and development. The nourishment needed for a baby's developing tissues and organs depends on the mother's diet; also, the health of the pregnant women depends on her diet. During ANC visits, mothers who attend learn to change their eating habits. Exclusive breastfeeding and lactation management are also major topics in ANC, information which might be distorted if given by friends or neighbours.

The results of this study indicate various other benefits for those women who participated in ANC. There were discussions on hygiene and birth control as reported by the women and there was also attention to routine exercise. For a number of participants, complications were detected and treated by doctors. Antenatal care for pregnant women by trained attendants has the potential to improve health outcomes for women and children. In the present study, anaemia in pregnancy was also detected for those with low PCV and this was attended to.

Proper monitoring of pregnancy can reduce maternal mortality, morbidity and other pregnancy complications. This also helps in safe delivery, hence antenatal care is an important aspect of pregnancy that all pregnant women should attend.

Conclusion

All pregnant women should initiate antenatal care early. The findings of this study suggest that duration of antenatal care clinics should not be too long, that is, not more than two hours for effective dissemination of knowledge and also to prevent boredom. It is therefore recommended that governments should encourage all pregnant women to attend ANC clinics and should also ensure that antenatal classes are provided in all community health centres, as this will help pregnant women access antenatal care. Care givers should also strictly follow guidelines and make sure that all the programmes in the guidelines are taught and involving all the five senses if possible for proper understanding.

Biography

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Welfare and Child Support Influence on Maternal Health and Wellbeing among Women in Abeokuta, Ogun State, Nigeria

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Abstract

This study focused on the relationship between welfare and child support influence on maternal health and wellbeing among women in Nigeria. A total of 250 married women drawn randomly from different groups in Ogun State constituted the sample for the study. Their ages ranged between 25-49 years with a mean age of 37 years, with standard deviation of 8.48. The two instruments used were author-constructed questionnaires with 0.74 and 0.79 as reliability coefficient respectively. The data obtained were analysed using multiple regression, correlation, and chi-square (X^2) statistics. The results indicated that significant relationship existed between work requirements ($r = 0.282$, $p < 0.05$), less use of preventive care ($r = 0.269$; $p < 0.05$), and health requirements ($r = 0.324$; $p < 0.05$), but not with bargaining position of mothers. The results also indicated that significant relationship existed between health insurance policy ($X^2 = 22.01$; $p < 0.05$), welfare policies and reforms ($X^2 = 45.83$; $p < 0.05$), but not with health care utilization and health behaviour. The results further indicated that a combination of the independent variable significantly predicted maternal health and wellbeing (F -ratio of 57.241; $p < 0.05$ alpha level). Based on the findings, it is recommended that social workers, guidance counsellors, psychologists and others in the helping profession should take cognizance of those variables that have been found to influence maternal health and wellbeing among women.

Keywords: maternal health, health care, health behaviour, welfare, child support, women, Nigeria

Introduction

Background to the study

An emerging body of research examines the link between the welfare reforms of the late 1990s and maternal and child health. Bitler, Gelbach, and Hoynes (2005) and Kaestner and Kaushal (2003) provide thorough reviews of how welfare reform, primarily via transitions to employment, may influence maternal health and the empirical evidence to date on this topic. A broader perspective on the role of welfare and child support policies, specifically, asks how the generosity and stringency of these policies, in general, may influence maternal health and wellbeing. In this regard, the view of welfare reform is as a set of policies that made public support less generous and private support more mandatory.

What does theory tell us about the potential influence of welfare and child support policies on maternal health and health behavior? With respect to welfare policies, theory is ambiguous and suggests two potential causal pathways through which welfare might influence health. First, Aid to Mothers with Dependent Children (AFDC), or “welfare”, was designed to aid mothers in dire circumstances, and for this reason we would expect generous welfare policies to improve mothers’ health, at least in the short run. Second, because welfare benefits are highly income-tested, they discourage work, which may lead to economic dependence in the long run. For this reason we might expect more generous welfare policies to reduce mothers’ health and increase negative health behavior. Finally, estimating the correct influence of welfare policies on maternal health is difficult because of a serious selection problem. Since welfare is a last resort for most mothers, those who turn to it for support are likely to be in poorer health than those who do not. Thus we would expect to find a negative association between welfare use and health.

With respect to child support, theory suggests that stronger child support policies should improve maternal health by improving the overall bargaining positions of mothers and by improving total income in the long run. In contrast, the influence of child support enforcement on mothers who depend on welfare is likely to be negative, since these mothers have little say in whether or not the father is ordered to pay child support and since child support dollars may not increase their income (as money is often paid through the state, with little money being passed through to the mother), at least in the short run.

Strong child support enforcement may actually reduce the income of mothers on welfare if they have been receiving informal transfers from the father. Formal child support payments often substitute for informal payments and typically go to the state rather than to the mother (Nepomnyaschy & Garfinkel, 2006). Most importantly, strong child support enforcement may increase conflict between mothers and non-resident fathers, which is expected to have negative influence on maternal health and health behavior. As in the case of welfare, estimates of the influence of child support policies on maternal health are likely to be biased by selection into the child support system. For non-welfare mothers, selection should be positive; that is, the most able and most healthy mothers should be the most likely to obtain a child support award. For mothers on welfare, however, selection should go in the opposite direction since welfare is selective of the least healthy mothers.

Empirical evidence

As noted in the introduction, the empirical research on the influence of welfare and child support policies on maternal health and health behavior is very limited. Although a number of studies have examined the association between welfare participation and maternal health, much of this literature is descriptive. The most frequently studied health outcome is depression, and here the causal evidence is weak (Lennon, Blome, & English, 2002), although some studies suggest a causal pathway (Chavkin, Romero, & Wise, 2000). A study by Blank (2002), focused primarily on child outcomes, found that selection into AFDC accounts for most of the association between welfare participation and maternal smoking or drinking during pregnancy. Research on the link between child support enforcement and maternal health is even more limited than research on the influence of welfare policies.

The Welfare Reform Act of 1996 stimulated some research on the influence of more restrictive welfare policies on maternal health, but most of this research focused on health insurance coverage, and to a lesser degree, on health care utilization and health behaviors. Evidence to date is mixed as to the influence of welfare reform on health insurance coverage. Many researchers find that tougher (more restrictive) welfare policies are associated with a loss of health insurance (Cawley, Schroeder, & Simon, 2006), while others find little to no influence (Bitler et al., 2005; Kaestner & Kaushal, 2003). While there is some debate as to the link between health insurance and health outcomes (Levy & Meltzer, 2004), there is substantial evidence that having health insurance is associated with more preventive care (Institute of Medicine, 2002). Therefore, it is not surprising that research suggests stricter welfare policies are associated with less health care utilization (Bitler et al., 2005; Kaestner & Kaushal, 2003; Kaestner & Lee, 2005) and higher incidence of unmet health needs (Bitler et al., 2005; Polit, London, & Martinez, 2001). A lack of health insurance coverage may contribute to future health problems if it inhibits mothers from seeking preventive care (Institute of Medicine, 2002).

With respect to health behavior, the evidence is mixed. On the negative side, there is some evidence that tougher welfare policies and stricter work requirements reduce breastfeeding which is positively associated with maternal and child health. According to one study, breastfeeding would have been 5.5% higher in the absence of welfare reform (Jayakody & Stauffer, 2000). There is also evidence that stronger child support enforcement is associated with increases in domestic violence, especially among mothers on welfare (Fertig, Garfinkel, & McLanahan, 2006). On the positive side, researchers have found that reductions in welfare caseloads (resulting from more restrictive policies) are associated with a reduction in binge drinking (Kaplan et al., 2005).

Despite the loss of health insurance, less use of preventive care, and some evidence of poorer health behaviors, there is little to no evidence that more restrictive welfare policies are associated with poorer health or mental health in the years following welfare reform. Researchers find no influence of welfare on mothers' weight, days in poor mental or physical health, or overall health status (Bitler et al., 2005; Kaestner & Tarlov, 2006). Although one study finds evidence that welfare recipients' health outcomes (hypertension, obesity, cholesterol) are worse after welfare reform, these results are based on a pre-post comparison of one state's welfare population compared with a national sample (Kaplan et al., 2005). It is also possible that the negative short-term impacts on health insurance coverage and health behaviors could have impacts on mothers' future health. In this, Bitler et al. (2005) use evidence from welfare-to-work experiments which suggest that welfare reform may be associated with increases in maternal mental health and overall child health. While the results are consistently positive, few are statistically significant.

Most studies on welfare and child support have been focused on family stability and income. It is, therefore, this researcher's understanding that no studies linking welfare and child support and maternal health and wellbeing have been conducted. It is against this background that this study becomes relevant in filling such gaps in our knowledge in the issue of welfare and child support influence on maternal health and wellbeing among women in Nigeria.

Purpose of this study

This study examined the influence of welfare and child support programs on maternal health and wellbeing of women in Nigeria. To achieve these objectives, the following research question and hypotheses have been posed and answered in the study at 0.05 alpha level:

(i). To what extent would health insurance policy, health care utilization, health behaviour, welfare policies and reforms, work requirement and less use of preventive care influence maternal health and wellbeing of women in Nigeria?

(ii). There will be no significant relationship between welfare support and maternal health and wellbeing among women.

(iii). There will be no significant relationship between child support and maternal health and wellbeing among women.

Methodology

Research design

The study is an ex-post factor research design. It is an after-fact study which does not involve the manipulation of any variable. The paramount goal was to ascertain the relationship of welfare and child support factors (health insurance policy, health care utilization, welfare policies and reforms, work requirement, and less use of preventive care) on the dependent variable (maternal health and wellbeing) without manipulating either of them.

Participants

A total of 272 married women aged 25-49 years were randomly selected from (i) Ogun State Teaching Service Commission (52), (ii) Ogun State Civil Service Commission (56), (iii) Police Officers' Wives Association (POWA) Abeokuta branch (54), (iv) Ogun State Women Political Group (52), and (v) Nigerian Army Officers' Wives Association (NAOWA) (58), all in Abeokuta metropolis in Ogun State, Nigeria. Twenty-two participants were eliminated from the analysis because they had missing information on variables of interest, resulting in a sample size of 250. The mean age of the participants was 37 years with a standard deviation of 8.48.

Instrumentation

Two instruments were used in the data collection:

- (1) Welfare and Child Support Questionnaire (WCSQ), and
- (2) Maternal Health and Wellbeing Inventory (MHWI).

The WCSQ is a 4-point Likert scale questionnaire in which participants were asked to indicate their feeling about each statement. It contains 30 items with response format anchored as *Strongly Agree*, *Agree*, *Disagree*, and *Strongly Disagree*. It has 0.74 and 0.79 as the internal consistency and revalidation reliability respectively. MHWI is a 25-item inventory

administered to the participants on women's maternal health and wellbeing. The test-retest reliability of the scale was found to be 0.69 and 0.73 respectively. The two instruments were author-constructed.

Procedure for data collection

The study was carried out between the months of March and August, 2009. The consent of the participants was sought and approval was given by the respondents with absolute confidentiality. The participants for the study were administered the two questionnaires in their various locations with the assistance of two researchers. The administration of the questionnaires to the participants took the researchers two weeks to complete. The collected questionnaires were scored and the data obtained from them were analyzed to answer the research question and the hypotheses generated. On the whole, 272 copies of the questionnaires were distributed and 250 copies were returned fully filled, giving a return rate of 92.0%.

Data analysis

The data collected were analysed using multiple regression, correlation, and chi-square (X^2) statistics to establish the influence of welfare and child support on maternal health and wellbeing among women. Also, frequency counts and percentages were used to determine the characteristics of the participants.

Results

Table 1 shows the frequency and percent distribution of the characteristic of the sample involved in the study. Six variables (educational background, chronological age range, number of children, duration in marriage, husbands' history of alcohol abuse, and witness of inter-parental violence) were examined with the following outcomes. A total of 250 married women were involved in the study: 5 of them had masters degree/doctorate degree, representing 2.0%; 86 had Higher National Diploma/university degree, representing 34.4%; 107 had Ordinary National Diploma/Nigeria Certificate of Education, representing 42.8%; 43 had school certificate/teachers' Grade II, representing 17.2%; while 9 had primary education, representing 3.6%. Thus, all of the participants (100%) had attended formal schooling of one kind or another, with the implication that all the participants were literate to a large extent.

A total of 27 participants (10.8%) were aged between 25-29 years, 21 (8.4%) between 30-34 years, 64 (25.6%) between 35-39 years, 79 (31.6%) between 40-44 years, and 59 (23.6%) between 45-49 years. The number of children in the family shows that 75 families (30.0%) had two children, 61 (24.4%) had three children, 52 (20.8%) had one child, 34 (13.6%) had four children, and 28 (11.2%) had five children and above. Thus, families with one to three children were mostly involved in the study.

Table 1: Frequency and percent distribution of the characteristics of the sample involved in the study

Variables	Frequency	%
1. Educational background		
No Formal Education	Nil	Nil
Primary Education	09	3.6
School Cert./Teachers Colleges	43	17.2
OND/NCE	107	42.8
HND/University Degree	86	34.4
Masters Degree/Ph.D.	05	2.0
Total	250	100
2. Chronological Age Range		
25-29 years	27	10.8
30-34 years	21	8.4
35-39 years	64	25.6
40-44 years	79	31.6
45-49 years	59	23.6
Total	250	100
3. Number of Children		
One	52	20.8
Two	75	30.0
Three	61	24.4
Four	34	13.6
Five and above	28	11.2
Total	250	100
4. Duration in Marriage		
0-4 years	49	19.6
5-9 years	63	25.2
10-14 years	116	46.4
15 and above	22	8.8
Total	250	100
5. Husbands' History of Alcohol Use		
Non-Alcoholics/Never	42	16.8
Occasional Drinker	71	28.4
Moderately	106	42.4
Chronic/Alcohol Addicts	31	12.4
Total	250	100
6. Witness Inter-parental Violence in Childhood		
I don't know/remember	101	40.4
No	82	32.8
Yes	57	26.8
Total	250	100

Source: Field survey, 2009

Table 2 indicates that a combination of the eight independent variables (health insurance policy, health care utilization, health behaviours, welfare policies and reforms, bargaining position of women, work requirement, less use of preventive care, and health requirement) in predicting maternal health and wellbeing of mothers gave a co-efficient of multiple regression (R) of 0.683 and a multiple R-Square (R²) of 0.467. The result shows that 46.7% of the variance in the prediction of maternal health and wellbeing is accounted for by the independent variables. Table 2 also indicates that the analysis of variance of the multiple regression data gave an F- ratio of 57.241 significant at 0.05 level of confidence.

Table 2: Regression analysis showing the joint contribution of welfare and child support on maternal health and wellbeing

Source of variation	Sum of squares	DF	Mean square	F	Sig.
Regression	189.364	3	63.121	57.241	.000
Residual	216.136	246	1.103		
Total	405.500				

Regression (R) = .683, Regression square = .467, Adjusted R square = .459, Std. Error of the Estimate = 1.05011

*Significant at 0.05 alpha level.

The results from Table 3 show that the x^2 calculated values for health insurance policy (22.01) is greater than the x^2 tabulated value (21.026), while the x^2 calculated value for welfare policies and reform (45.83) is greater than the x^2 tabulated value (38.885). Health care utilization and health behaviour were not significantly related to maternal health and wellbeing among women.

Table 3: Chi-Square analysis showing the influence of welfare support and maternal health and wellbeing among women

Variables	x^2 cal	x^2 tab	DF	Level of significance	Decision	Contingency coefficient
Health insurance policy	22.01	21.026	1	0.05	S*	0.0140
Health care utilization	28.43	43.776	4	0.05	NS	0.0157
Health behaviour	16.34	43.773	3	0.05	NS	0.0204
Welfare policies and reforms	45.83	38.885	1	0.05	S*	0.0189

*Significant at 0.05 alpha level.

The results in Table 4 show that there is a significant relationship between work requirement (r- value = 0.282, $p < 0.05$), less use of preventive care (r- value = 0.269, $p < 0.05$), and health requirement (r- value = 0.324, $p < 0.05$), while bargaining position of mothers was not significant.

Table 4: Correlation analysis showing the linear relationship between child support and maternal health and wellbeing among women

Variables	Pearson correlation coefficient R	Coefficient of determination r^2	Decision	Percentage contribution %
Bargaining position of mothers	-0.042	0.001764	NS	0
Work requirement	0.282*	0.079524	S*	7.9
Less use of preventive care	0.269*	0.072361	S*	7.2
Health requirement	0.324**	0.104976	S*	10.4

Source: Field survey, 2009]

*Significant at 0.05 level of significance

**Significant at 0.01 level of significance

Discussion of findings

The results obtained showed that a combination of health insurance policy, health care utilization, health behaviours, welfare policies and reforms, bargaining position of mothers, work requirement, less use of preventive care, and health requirement, when taken together, seemed to be effective in predicting maternal health and wellbeing among women. The observed F-ratio of 57.241, significant at 0.05 level, is evidence that the effectiveness of a combination of the independent variables in the prediction of maternal health and wellbeing among women could not have occurred by chance. Furthermore, the coefficient of multiple correlation of 0.683 and a multiple R- square of 0.467 showed the magnitude of the relationship between welfare and child support and the combination of the independent variables. The results indicated that a linear relationship of the independent variables accounted for only 46.7% of the total variance in maternal health and wellbeing among women.

Based on the above, the results agree with the findings reported by Lennon et al. (2002), Fertig et al. (2006), and Garrett and Holahan (2000). However, the result is at variance with findings reported by Bitler et al. (2005). Institute of Medicine (2002) reported that all the independent variables (of health insurance policy, health care utilization, health behaviours, welfare policies and reforms, bargaining position of mothers, work requirement, less use of

preventive care, and health requirement) were consistently related to maternal health and wellbeing among women.

The results in Table 3 revealed the chi-square relationship of welfare and child support and the independent variables. The results showed that health insurance policy and welfare policies and reforms contributed significantly to the prediction, whereas health care utilization and health behaviour did not. Another finding from this study, that health insurance policy was a major predictor of maternal health and wellbeing, supports the work of Levy and Meltzer (2004), Cawley et al. (2006), and Fertig et al. (2006). A surprising finding from this study is that health care utilization and health behaviour were not significant predictors of maternal health and wellbeing. This finding is at variance with the work of previous researchers such as Bitler et al. (2005) and Kaestner and Kaushal (2003).

The results in Table 4 revealed the correlation relationship between the independent variables and maternal health and wellbeing among mothers. The results showed that work requirement, less use of preventive care, and health requirement contributed significantly to the prediction of maternal health and wellbeing, while bargaining position of mothers did not. The significant position of work requirement, less use of preventive care, and health requirement were in agreement with the findings of Lennon et al. (2002) and Chavkin et al. (2000).

Implication for counselling

The findings from this study have implications for counselling psychologists, health workers, and social workers among women and adolescents of reproductive age. First, there is the need for those in these helping professions to identify variables as health insurance policy, health care utilization, health behaviours, welfare policies and reforms, bargaining position of mothers, work requirement, less use of preventive care, and health requirement among women, because these variables relate to maternal health and wellbeing. Once these variables are identified through assessment and personal counselling, giving appropriate intervention assistance to women having maternal health and wellbeing problems will be possible. Secondly, mothers and adolescents of reproductive age should seek personal counselling in order to handle maternal health problems. In addition, health counsellors should provide a supportive relationship for personal development towards total health. Thirdly, women should be encouraged to participate in group counselling experiences to reduce problems related to maternal health and wellbeing.

Biography

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Aesthetic preferences for textile colour and print pattern between US and Japanese consumers

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Abstract

As the textiles and apparel industry has internationalized, understanding of similarities and differences in apparel-purchasing behaviour is important for success in global markets. Previous research found that aesthetic attributes are important criteria in consumers' evaluation of textiles and apparel products and aesthetic evaluation of textiles is influenced by culture. However, little research has examined consumer preferences for aesthetic attributes with multiple design variables, or how culture, especially national culture, influences aesthetic appraisals. This research examined the influence of nationality on the appraisal of two aesthetic attributes (colour and print pattern) of textiles. The Engel, Miniard, and Blackwell model of consumer decision processes was the framework for the study. The mall-intercept method was used to collect data from female consumers in Denver, US (n=102) and Yokohama, Japan (n=106). Among demographic characteristics only nationality influenced colour preferences; nationality and age influenced print pattern preferences. Differences in colour preferences were more pronounced than in print pattern preferences. Criteria used for U.S. and Japan consumers' evaluation of textiles also differed. Relationships among cultural characteristics and aesthetic preferences for each nationality were also discovered. Understanding aesthetic preferences can help international marketers and manufacturers and domestic companies provide products that satisfy the needs of target markets.

Keywords: Aesthetics, colour, print, nationality, culture

Introduction

According to an industry profile of Global Apparel and Textiles (Datamonitor, 2010), four leading companies in the global textiles and apparel industry, based on global market share, are Gap, Inc., Hennes & Mauritz AB, Intidex SA, and PPR. All these leaders are engaged in worldwide enterprises through manufacturing and marketing. As such, none is able to operate in monocultural isolation. Today, the textiles and apparel industry is considered one global sector. As the industry has internationalized, consumers are increasingly purchasing imported products. Success in the global market requires an understanding of the similarities and differences in consumers' apparel-purchasing behaviour and the development of marketing strategies based on these differences. Although national culture has been identified as an important variable for market segmentation, little research has been conducted that provides implications for modifying product attributes to meet local consumers' needs. Aesthetic attributes, such as styling and colour, are important criteria in consumers' evaluation of textile and apparel products (Eckman, Damhorst, & Kadolph, 1990; Hines & Swinker, 2001; Hsu & Burns, 2002). However, research related to aesthetic preferences is generally confined

to single design variables (Lind, 1993; Radeloff, 1991; Shoyama, Tochihara, & Kim, 2003). A quantitative examination of consumer preferences for aesthetic attributes with the interactions among visual elements seems lacking.

When consumers make purchasing decisions they think, evaluate, and act. Those activities are influenced by internal and external factors. Blackwell, Miniard, and Engel's (2001) consumer decision process model (EBM) represents interactions among various factors and consumer behaviour. The model consists of seven stages: need recognition, information search, pre-purchase evaluation of alternatives, purchase, consumption, post-purchase evaluation, and divestment. Individual influences (e.g., demographics), environmental influences (e.g., culture), and psychological processes (e.g., information processing) influence consumer decision making at each stage.

The EBM model suggests that culture impacts all stages of the decision-making process. For example, apparel and appearance tend to be distinctive by culture (Harris & Moran, 1996), and culture impacts consumers' apparel selection (Marshall, Jackson, Stanley, Kefgen, & Touchie-Specht, 2004). Culture is defined as "a set of values, ideas, artifacts, and other meaningful symbols that help individuals communicate, interpret, and evaluate as members of society" (Blackwell et al., 2001, p. 314). Macroculture, such as national culture, applies to an entire society or to most of its citizens and is influenced by nationality and regional identity. Microculture is influenced by such characteristics as age and ethnicity. The US consists of a diverse ethnic microculture; Japan is a homogeneous society (Blackwell et al., 2001). Both macroculture and microculture impact consumers' decisions, including preferences for and choices of products they purchase (Blackwell et al., 2001; Wilkie, 1994).

Culture

With the globalization of the world economy, marketers and researchers have recognized how culture, especially nationality, affects consumer behaviour (e.g., Bao, Zheng Zhou, & Su, 2003; Blackwell et al., 2001). Hofstede (1984) postulated four dimensions of national culture, which provide a basis for comparing the influence of national culture on individual behaviour, which have implications for conducting business across cultures, including how information is processed, acceptance of new ideas, and purchase behaviour. These four dimensions are individualism-collectivism (the relationship with others in society), power distance (degree of acceptance of power inequality), masculinity-femininity (extent of importance to achievement/assertiveness versus nurturing/modesty), and uncertainty avoidance (the reaction to ambiguity or uncertainty about the future).

Bao et al. (2003) examined the influence of two dimensions of national culture, face consciousness and risk aversion, on U.S. and Chinese consumers. Using Hofstede's (1984) typology as a framework, the researchers found that both face consciousness and risk aversion influenced U.S. and Chinese consumers' decision-making styles. Face consciousness is a desire for enhancement and maintenance of social self-worth or avoidance of losing face in a relationship with others in a society (Bao et al., 2003). In an individualistic culture (e.g., US) personal self is an independent entity and decision making depends on the individual. In collectivistic cultures (e.g., Japan) group membership affects personal preference and choice of products (Blackwell et al., 2001). Therefore, people in collectivistic cultures tend to have

stronger face consciousness than do those in individualistic cultures. Bao et al. (2003) found a positive relationship between face consciousness and novelty and fashion-conscious orientation.

Risk aversion is the willingness to avoid risks and uncertainty (Sternquist, 1998). People with high risk aversion tend to fear risky, ambiguous situations more than low risk aversion individuals do. In a collective culture, behaviour that sustains group orientation is desirable, and risk-taking behaviour may challenge that harmony. In an individualistic culture, risk-taking behaviour affects only individual merit and people tend to have less risk aversion. New products are associated with an uncertainty that the established products lack. Therefore, consumers with high risk aversion may be less novelty- and fashion-conscious than are consumers with low risk aversion.

Numerous studies have found that microcultural factors, such as age, education, ethnicity, gender, and income, influence consumers' decision making (e.g., Blackwell et al., 2001; Kim & Kang-Park, 1995; Lee, Fairhurst, & Dillard, 2002; Shim, 1996; Wickliffe, 1998). Segmenting consumers by microcultural factors assists marketers and researchers in profiling consumers, understanding changing needs, and developing marketing strategies for market share expansion to specific target markets (Wickliffe, 1998).

Culture impacts consumers' apparel selection (Harris & Moran, 1996; Marshall et al., 2004). Nationality, which is a macrocultural element, affects aesthetic evaluation of apparel products (Cheng, 1997; Hyllegard & Morgado, 2001; Moreno, 1997). Microcultural elements, such as age and ethnicity, also affect aesthetic evaluation of apparel products (Eckman & Wagner, 1994; Littrell, 1980; O'Neal, 1997). The present study, using the EBM model as a framework, examines the interaction between cultural influence and consumers' appraisals of aesthetic attributes of textiles. Textiles and consumer behaviour are both important subjects for study in the discipline of home economics.

Literature review

Aesthetics

Aesthetic attributes are important to the pre-purchase alternatives evaluation stage in the consumer decision-making process; aesthetic attributes of apparel are important criteria in consumers' evaluation and consumption of products (Eckman et al., 1990; Friend, Farney, & Rabolt, 1989; Hines & Swinker, 2001; Hsiao & Dickerson, 1995; Hsu & Burns, 2002; Kawabata & Rabolt, 1999; Lee & Burns, 1993). Apparel products consist of the interactions among silhouette, design details, and fabric (Sproles & Burns, 1994). Trends of design details and fabrics change almost every year (Pantone, 2007). Aesthetic preference consists of a consumer's positive evaluation of aesthetic qualities over the other characteristics (Fiore & Kimle, 1997). A study of aesthetic preferences for Hawaiian printed fabrics (Hyllegard & Morgado, 2001) compared evaluations by consumers of five nationalities. The results indicated cross-national differences in colour and print preferences for aloha shirts. The researchers suggested that understanding visitors' preferences would help local marketers and manufacturers to approach tourists and local consumers as heterogeneous cultural groups and better satisfy the needs and preferences of both markets in Hawaii.

Studies of colour preferences have been conducted for more than 100 years. Entire studies have focused on the most preferred colours (Fehrman & Fehrman, 2004). For example, using the Munsell colour system, Lind (1993) explored preferences for apparel. Purple-blue and blue were ranked high and green was ranked low. Compton's (1962) study of colour and design preferences in apparel fabrics revealed that students who preferred deep shades and saturated colours scored higher in sociability. Duntley (1982) examined how apparel colour affects first impressions of personality traits; cool colours tended to communicate more favourable personality traits than warm colours did.

A cross-national study of colour preferences among consumers in eight countries (i.e., Austria, Brazil, Canada, Colombia, Hong Kong, China, US, and Taiwan), revealed that blue was the most preferred colour (Madden, Hewett, & Roth, 2000). Studies that compared consumers of various nationalities found that national culture, in addition to colour attributes, influenced colour preference. For example, participants in Korea, Taiwan, Indonesia, China, and Japan, when asked to select the three most preferred colours and the three least preferred colours from 77 colours in the Munsell colour system, indicated that blue was the universal favourite colour and showed a strong preference for white (Saito, 1996a, 1996b; Soma & Saito, 1996). At the same time, Japanese individuals revealed unique colour preferences in their partiality for pale tone colours such as pale blue and pale green, and non-preference for yellow red, light grey, and dull tone colours. Colour is also an important product attribute (Madden et al., 2000). In their apparel study, Hyllegard and Morgado (2001) found strong preferences for blue in Aloha shirts among all five nationalities tested (i.e., Australian, Chinese, Japanese, Korean, and American); subjects showed low preferences for yellow and black.

Patterns in fabric are comprised of motifs, size of motifs, layout, and colours. Layout includes direction of motifs, space between motifs, and arrangement of motifs. Arrangements of motifs are either formal (i.e., regular repetition of motifs in a pattern) or informal (i.e., irregular placement of motifs). Space between motifs means a proportion of background and spaces of motifs. Interest is created when the ratio of background and space occupied by motifs is different. Fabric designers classify patterns as conversational, floral, ethnic, and geometric (Marshall et al., 2004). Conversational patterns are created with motifs of real creatures and objects, except flowers; floral patterns include flowers and plants and are considered the oldest and most frequently printed design; ethnic patterns represent any pattern related to ethnic groups; and geometric patterns include abstract designs in which motifs are non-representational and shapes may be unrealistic.

In the study of the relationship between personal attributes and colour and design preferences, Compton (1962) found that students who preferred small motifs tended to score higher on good impression personality in the California Psychological Inventory, and on femininity. Hyllegard and Morgado's (2001) study revealed that almost half of the participants preferred the small Hawaiian prints, 28% preferred medium prints, and 6% preferred large prints. Korean participants preferred flower garden prints and U.S. subjects preferred tapa cloth prints. Differences also existed by nationality in participants' preferences for floral, beach, and tapa prints.

Differences in aesthetic preferences may arise from different perceptions of aesthetics among cultures (Fiore & Kimle, 1997). While European and North American cultures believe that aesthetics stimulate and/or evoke the internal feelings and thoughts and aesthetic preference is influenced by the qualities of aesthetic objects, Japanese culture perceives aesthetics as a medium to calm oneself. Aesthetic preferences depend on inner feelings and thoughts of self-reflection in Japanese culture (Deutsch, 1975). Those unique perceptions of aesthetics have distinguished traditional appearances and influenced fashion change among cultures. The end of national isolation by the U.S. - Japan Treaty of Peace and Amity in 1853 and the Meiji Restoration in 1868 helped western clothes flow into Japan and, subsequently, the modernization of Japanese fashion began. The westernization of Japanese fashion occurred slowly but certainly spread from the top to the bottom of society because western apparel had more practical features than kimono did. Because Japanese culture exhibits different perceptions in aesthetics from western culture and Japanese fashion reflects unique combinations of western and traditional Japanese fashion, Japanese consumers could have distinct aesthetic preferences for apparel (Kondo, 1995).

It is believed that a unique perception of colours also exists in Japan (e.g., Saito, 1996a). The Japanese aesthetic of colour has been influenced by the early agrarian society's concern with nature and the four seasons as well as the influence of Shintoism, which practices a strong respect of nature, seasonal flowers, and plants. The majority of the traditional colour terms derive from seasonal vegetable dyes, flowers, and plants. Although the Japanese way to perceive colours changed as time passed, there are remnants of unique perception in colours. For instance, while children paint the sun in yellow in most countries, Japanese children tend to use red for drawing the sun (Hibi & Fukuda, 2000). In Japan, there may be a wide variety of additional factors, such as personality, that could influence colour preferences.

Purpose

This study was conducted to test the premise that national culture affects consumers' appraisal of textiles. Because colour and pattern are important criteria to move a consumer positively toward a purchase decision, this study focused on evaluating the influence of national culture on colour and print pattern of textiles, and to identify consumers' preferences for aesthetic attributes.

Japanese and U.S. populations were targeted. This bi-national approach resembles that of Kawabata and Rabolt (1999) who examined apparel purchase behaviour by U.S. and Japanese female students; however, the framework of this study is substantially different. It is important to note that the US has a national culture composed of a more ethnically heterogeneous population than does Japan. Therefore, the effect of Japanese nationality on aesthetic preferences may be more pronounced. Additionally, Japan is an important trading partner with the US. Total textile and apparel trade to Japan in 2009 was 466.79 million dollars and Japan was the sixth largest importer of U.S. textiles and apparel (Office of Textiles and Apparel, 2006). As such, a US - Japan focus is quite relevant. The goal was to examine how nationality affects preferences for two aesthetic attributes (colour and print pattern) of textiles among U.S. and Japanese consumers.

Method and description of participants

The literature suggests that culture, especially national culture, influences aesthetic preferences. The literature also reveals a lack of research on consumer preferences for aesthetic attributes with multiple design variables. Therefore, this research examined the influence of nationality on the appraisal of two aesthetic attributes (colour and print patterns) of textiles. The research questions were:

1. Are there differences in aesthetic preferences for colour and print pattern of textiles between U.S. and Japanese consumers?
2. What criteria influence these aesthetic preferences toward textiles?
3. Do demographic characteristics (microculture) influence aesthetic preferences toward textiles?
4. Do cultural characteristics (macroculture) influence aesthetic preferences toward textiles?

Aesthetic preferences for visual attributes are the dependent variables. Demographics and cultural characteristics are the independent variables.

Holbrook (1983) suggested that when consumers evaluate products, a complicated interaction of a variety of cues in the shopping environment influences their decision. Therefore, the purchase setting plays an important role in encouraging accuracy of response to product evaluation. Thus, the mall-intercept method was used to collect data. Two malls were selected: one in Denver, US, and the other located in Yokohama, Japan. Each mall offers several hundred retail stores, boutiques, salons, and a large space for community events. Because generations X and Y tend to put a priority on apparel in spending choices (Marshall et al., 2004), the participants for this research consisted of U.S. and Japanese female consumers, aged between 18 and 41. The total number of participants was 208, with 102 recruited in the US and 106 in Japan.

Participants evaluated visual images of colour and print patterns (during August in Japan and September in the US) based on textile and apparel trend forecasts for the 2006/2007 fall and winter season, provided by Cotton Incorporated, a trade association that forecasts trends for the textile and apparel industry. Colours were categorized under six stories and each story included six colours. Print patterns consisted of five stories and each story included three images. The questionnaire included three sections: colour preferences, print pattern preferences, and participants' information including demographic and cultural characteristics. The questionnaire was written in English first and then translated into Japanese.

The cover letter for the questionnaire informed participants that the research was being conducted to understand aesthetic preferences for textiles; no specific product was identified as colour preferences should be investigated without association with a particular object (Saito, 1996a). The word "textiles" was used throughout the questionnaire. Participants were

shown visual images and descriptions of colour stories (see Figure 1). Participants read the descriptions and answered the questions. Participants stated the degree of their perceived attractiveness for each colour story and then evaluated each colour (a total of 36 colours) on 7-point Likert-type item scales. Then, participants selected the three most attractive colours, recorded the colour names in order of attractiveness, and recorded the reasons for their choices. After answering the colour attractiveness questions, participants were shown visual images and descriptions of print patterns (see Figure 2). Participants read the descriptions and answered the questions. Participants indicated the degree of perceived attractiveness for each story on 7-point Likert-type item scales, selected one top choice from the print stories, and recorded the reason for their choice.

Finally, participants answered questions about themselves, which focused upon demographic information and cultural characteristics (i.e., risk aversion, face consciousness, sociability, and femininity). The exchange rate at the time of the survey was used to convert items addressing income and apparel purchase expenses. Prior to data collection the instrument was pre-tested with U.S. and Japanese individuals from generations X and Y.

Quantitative data analyses of the rating scales and demographics consisted of descriptive statistics. A free response format for the open-ended questions encouraged participants to use a wide variety of descriptors of their top choices among colours and prints; content analysis enabled the examination of qualitative data concerning participants' descriptions of their preferred aesthetic attributes. Because it is possible that differences in aesthetic preferences arise from different perceptions of aesthetics among cultures, qualitative data may lead to a better understanding of influences on aesthetic preferences between U.S. and Japanese cultures.

Triangulation of data (data were collected and analysed through participants' written free responses, statistical data, and perceptions of visual images based on apparel trend forecasts) helps enhance reliability and verification of the study (Cresswell, 2007; Willis, 2007). A bilingual student served as a peer examiner for translation of the research instrument from English to Japanese and of participants' free responses from Japanese to English to prevent researcher's bias and misinterpretation. A code/re-code procedure (the researcher coded the data, then waited for a period of time, and re-coded the data) and inter-rater reliability (a second researcher coded the open-ended responses which were then compared with the original codes) were important in order to provide clear and accurate descriptions (Cresswell, 2007).

INTRIGUE	PROVOCATEUR	MUSE	DESTINATION	TRIUMPH	EXPRESSION
 <p>Double Agent PANTONE 19-4006 TC</p> <p>Magnum PANTONE 17-0000 TC</p> <p>White Lies PANTONE 11-0604 TC</p> <p>Sable PANTONE 16-1221 TC</p> <p>Martini PANTONE 13-4305 TC</p> <p>Envy PANTONE 16-6339 TC</p>	 <p>Dowager Empress PANTONE 19-1664 TC</p> <p>Paramour PANTONE 19-1656 TC</p> <p>Smoldering PANTONE 18-1536 TC</p> <p>Unmentionables PANTONE 15-1512 TC</p> <p>Mystique PANTONE 18-1415 TC</p> <p>Dark Chocolate PANTONE 19-0712 TC</p>	 <p>Will-o-the-Wisp PANTONE 16-0659 TC</p> <p>Marble PANTONE 14-1112 TC</p> <p>Goddess PANTONE 16-1310 TC</p> <p>Daydream PANTONE 13-1020 TC</p> <p>Silver Lining PANTONE 14-4203 TC</p> <p>Illuminate PANTONE 12-0825 TC</p>	 <p>Laguna PANTONE 18-4018 TC</p> <p>Painted Desert PANTONE 16-1350 TC</p> <p>Terrain PANTONE 18-1022 TC</p> <p>Treasure PANTONE 16-0950 TC</p> <p>Galaxy PANTONE 19-3810 TC</p> <p>Currency PANTONE 15-6310 TC</p>	 <p>First Place PANTONE 17-4030 TC</p> <p>Adrenaline PANTONE 13-1008 TC</p> <p>Torch PANTONE 17-1553 TC</p> <p>Shooting Star PANTONE 13-0850 TC</p> <p>Benched PANTONE 19-1334 TC</p> <p>Royal PANTONE 19-3864 TC</p>	 <p>Toxic PANTONE 12-0435 TC</p> <p>Teardrop PANTONE 17-3930 TC</p> <p>Lip Gloss PANTONE 19-3138 TC</p> <p>Looking Glass PANTONE 16-5418 TC</p> <p>Jaded Ivy PANTONE 19-4535 TC</p> <p>Broken Heart PANTONE 13-1407 TC</p>
<p>A sophisticated palette that piques curiosity.</p> <p>Neutral shades accented by electric green adds a touch of eccentricity.</p> <p>Daring, distinctive and stylish.</p> <p>Traditional meets progressive.</p>	<p>Rich, passionate tones make the heart beat faster.</p> <p>Theatrical reds that are powerful and dramatic.</p> <p>Feverish and flushed.</p> <p>Succulent shades create warmth.</p>	<p>Inspiration that stimulates your inner being.</p> <p>Muted tones, Zen-like and meditative.</p> <p>Peaceful slumber gives way to sweet dreams.</p> <p>Shimmering peach and luminous yellow; exquisite and angelic.</p>	<p>Exotic adventures and globetrotting escapades.</p> <p>The classic charm of a vintage postcard.</p> <p>Golden tones are luxurious and deeply saturated.</p> <p>Sophisticated and worldly.</p>	<p>Nostalgic shades that celebrate past achievements.</p> <p>Keen and energetic.</p> <p>Natural tones play second string to vibrant hues.</p> <p>Bold brights and brilliant blues.</p>	<p>Untamed creativity.</p> <p>Intense colors with a hint of rebellion.</p> <p>Cool cosmetic shades.</p> <p>Whimsical yet edgy, electrifying.</p>

Figure 1: Colour stories and individual colours.

SUBDUED	RECOLLECTION	ABSTRACTED	ROMANTIC	BUSYBODY
<p>Mosaic and tile effects</p> <p>Softened with subtle color</p> <p>Printed over, worn and washed out</p> <p>Understated patterns</p>	<p>1930's & 1940's inspired styling</p> <p>Flat yet conveying great detail</p> <p>Revival of historical textile patterns</p> <p>Prints mimic woven patterns</p>	<p>Blurred perceptions</p> <p>Warp and ikat prints</p> <p>Mottled background</p> <p>Sliced and streaky effects</p>	<p>Romance conveyed in both poetic and dark themes</p> <p>Updated English florals</p> <p>Dark grounds</p> <p>Oriental inspired florals</p>	<p>Small-scale, concentrated patterns</p> <p>Meandering, lacking point of reference</p> <p>Nature taken out of context</p> <p>Florals in discordant colors</p>

Figure 2: Print pattern stories

Characteristics of participants

Data were collected on weekends during successive months in late August (Japan) and then two weeks later in September (US). The average high temperatures in the data locations were similar (Japan, 84 degrees; US, 77 degrees). The average low temperatures differed somewhat (Japan, 76 degrees; US, 48 degrees). A total of 100 U.S. female consumers returned usable questionnaires. Ninety-one percent of U.S. participants answered that they were white. The mean age was 29 years. A majority of respondents had a bachelor's degree or higher (74%) and incomes between \$25,000 and \$74,999 (54%). Fifty-one percent of the respondents reported annual apparel purchase expenses in the range of \$1,000 to \$4,999.

A total of 104 Japanese consumers returned usable questionnaires. Ninety-eight percent of the participants reported their ethnicity to be Japanese. The mean age of respondents was 28 years. Half of the respondents (50%) held a bachelor's degree or higher and 40% had incomes in the range of \$25,000 to \$74,999. A majority (62%) of the respondents had annual apparel expenditures between \$1,000 and \$4,999.

Chi-squares were calculated to test for differences in demographics between U.S. and Japanese respondents. Results revealed differences with regard to education ($X^2=29.58$, $p<.001$) and household income ($X^2=26.06$, $p<.001$), with U.S. respondents having higher levels than Japanese respondents. However, there were no significant differences in the other demographic characteristics.

Three items were adapted from Bao et al. (2003) to examine consumers' general tendency to avoid uncertainty (e.g., "I am cautious in trying new/different products"). The reliability of the risk aversion scale was .676 (Cronbach's Alpha). A higher score equals greater risk aversion in consumption. Japanese respondents ($M=4.56$) tended to be more risk averse than were U.S. respondents ($M=3.80$) ($t=3.839$; $p<.001$). The results are consistent with findings in the literature, which indicate that people in a collectivistic culture have more risk aversion.

Four items measured consumers' face consciousness (e.g., "It is important that others like the products and brands I buy") (Bao et al., 2003). The higher score means consumers have a higher degree of face consciousness. Reliability of the scale was .737 (Cronbach's Alpha). According to Bao et al. (2003), people in a collectivistic culture tend to have stronger face consciousness than do those in an individualistic culture. However, U.S. respondents ($M=3.32$) in this study were more face conscious than were Japanese respondents ($M=2.72$) ($t=-3.368$; $p<.001$).

The sociability scale (Reynolds & Beatty, 1999) consisted of seven items (e.g., "I like to be with people"). Reliability of the sociability scale was .798 (Cronbach's Alpha). U.S. respondents ($M=2.54$) were more sociable than Japanese respondents ($M=3.38$) ($t=6.193$, $p<.001$).

Reliability of the sexual identity scale (Stern, Barak, & Gould, 1987) was .756 (Cronbach's Alpha). Four items comprised the scale (e.g., "I feel as though I am ..."). U.S. respondents

($M=3.81$) viewed themselves as more feminine than did Japanese respondents ($M=3.04$) ($t=-10.891$, $p<.001$).

Results

Colour preferences

Table 1 reveals differences between U.S. and Japanese participants for all six colour stories. U.S. respondents considered Intrigue ($t=6.727$), Provocateur ($t=3.408$), and Destination ($t=3.040$) more attractive than did Japanese respondents. On the other hand, Japanese respondents preferred Muse ($t=-2.017$), Triumph ($t=-3.049$), and Expression ($t=-3.434$) more than did U.S. respondents.

Table 1: Comparison of perceived attractiveness of colour stories between Japan and U.S. participants

	U.S.		Japan		T-test
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
INTRIGUE	2.69	1.46	4.19	1.71	6.727***
PROVOCATEUR	2.63	1.52	3.37	1.56	3.408***
DESTINATION	3.39	1.46	4.05	1.63	3.040**
MUSE	3.97	1.71	3.50	1.62	-2.017*
TRIUMPH	4.34	1.50	3.64	1.75	-3.049**
EXPRESSION	3.83	1.75	3.02	1.63	-3.434***

* $p<.05$; ** $p<.01$; *** $p<.001$; Range: 1= Very attractive to 7= Very unattractive

The two nationalities differed in their perceptions of the attractiveness of 27 out of 36 individual colours (see Table 2). Of the 27 colours that the two groups perceived differently, U.S. respondents considered 17 colours to be more attractive than did Japanese respondents; Japanese respondents perceived 10 colours to be more attractive.

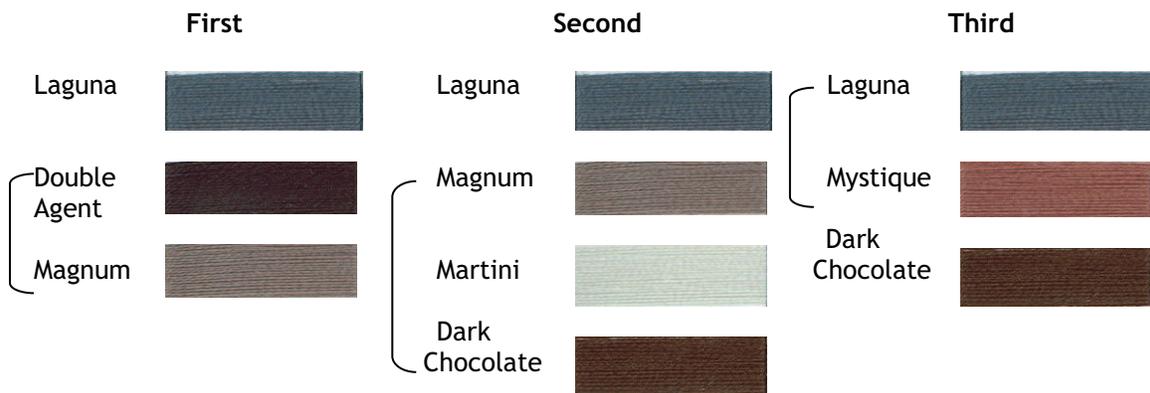
Table 2: Comparison of perceived attractiveness of colours between Japan and U.S. participants

		U.S.		Japan		T-test
		M	SD	M	SD	
Intrigue	Double Agent	2.37	1.54	3.36	1.55	4.57***
	Magnum	2.69	1.60	3.90	1.47	5.655***
	White Lies	2.72	1.42	3.53	1.58	3.843***
	Sable	3.20	1.60	3.68	1.55	2.185 [†]
	Martini	3.01	1.52	3.81	1.70	3.526***
	Envy	3.51	1.94	3.68	1.87	.647
Provocateur	Dowager Empress	3.37	1.79	3.59	1.83	.854
	Paramour	2.66	1.63	3.54	1.71	3.753***
	Smoldering	3.17	1.72	3.47	1.71	1.252
	Unmentionables	3.04	1.66	3.51	1.69	2.003 [†]
	Mystique	2.68	1.58	3.52	1.74	3.606***
	Dark chocolate	2.23	1.40	3.19	1.50	4.743***
Muse	Will-o-the-Wisp	4.44	1.99	3.35	1.67	-4.269***
	Marble	3.57	1.57	3.87	1.51	1.373
	Goddess	3.44	1.51	3.88	1.52	2.101 [†]
	Daydream	3.74	1.62	3.14	1.68	-2.578 [†]
	Silver Lining	3.28	1.42	3.92	1.55	3.085**
	Illuminate	3.95	1.72	3.38	1.66	-2.388 [†]
Destination	Laguna	2.40	1.48	3.49	1.89	4.571***
	Painted Desert	3.89	1.81	3.03	1.69	-3.513***
	Terrain	3.59	1.55	3.85	1.47	1.21
	Treasure	4.35	1.74	3.98	1.55	-1.602
	Galaxy	2.76	1.48	3.67	1.84	3.905***
	Currency	3.26	1.50	4.03	1.74	3.376***
Triumph	First Place	3.45	1.77	2.97	1.69	-1.981 [†]
	Adrenaline	3.58	1.35	4.04	1.57	2.233 [†]
	Torch	4.45	1.71	3.91	1.80	-2.181 [†]
	Shooting Star	4.98	1.27	3.68	1.76	-6.018***
	Benched	4.00	1.71	4.71	1.43	3.225***
	Royal	3.71	1.77	3.73	1.72	.085
Expression	Toxic	4.44	2.00	3.38	1.89	-3.913***
	Teardrop	3.19	1.50	2.90	1.45	-1.384
	Lip Gloss	3.94	1.71	3.52	1.80	-1.71
	Looking Glass	3.42	1.81	2.82	1.59	-2.531 [†]
	Jaded Ivy	2.80	1.55	3.65	1.76	3.67***
	Broken Heart	3.86	1.54	3.38	1.66	-2.166 [†]

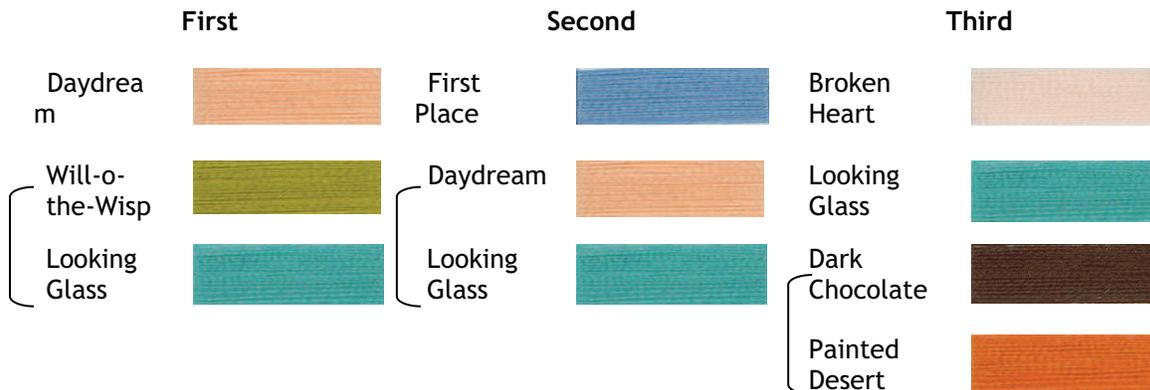
* p< .05 ; ** p< .01; *** p< .001 Range: 1= Very attractive to 7= Very unattractive

U.S. respondents' first three colour choices were Laguna (11.0%) and Double Agent and Magnum (both 9.0%), while colours selected by Japanese respondents were Daydream (8.7%) and Will-o-the-Wisp and Looking Glass (both 7.7%) (see Figure 3). Colours selected by U.S. respondents tended to be neutral in nature, while those selected by Japanese respondents tended to be brighter. U.S. respondents selected solid or neutral low value colours such as brown, grey, and navy. Japanese respondents selected middle-value colours such as pink and blue-green. The only colour ranked in the top three colour choices by both U.S. and Japanese respondent groups was Dark Chocolate.

U.S. participants



Japanese participants



[represents equal number of choices

Figure 3: The first three favourite colours by U.S. and Japanese participants.

Responses from U.S. participants concerning the criteria that influenced reasons for selecting their top three colour choices were assigned to 24 categories, while responses from Japanese subjects were assigned to 28 categories. The top categories used by U.S. respondents as criteria for their selection were brightness (n=32), complementary to physical appearance and wardrobe (n=27), neutral colour (n=25), appeal of colour/favourite colour/closest to a favourite colour image (n=20), and richness (n=17) (see Figure 4). The criteria for selecting

the most attractive colours by Japanese respondents were appeal of colour/favourite colour/closest to a favourite colour image (n=40), brightness (n=26), complementary to physical appearance and wardrobe (n=20), calm (n=16), and pale (n=14). U.S. respondents were much more likely to use the criteria of neutral colour, richness, and warm than were Japanese respondents. Japanese respondents were more likely to use pale, not primary colours, beautiful/pretty, uniqueness, and good for the season than were U.S. respondents.

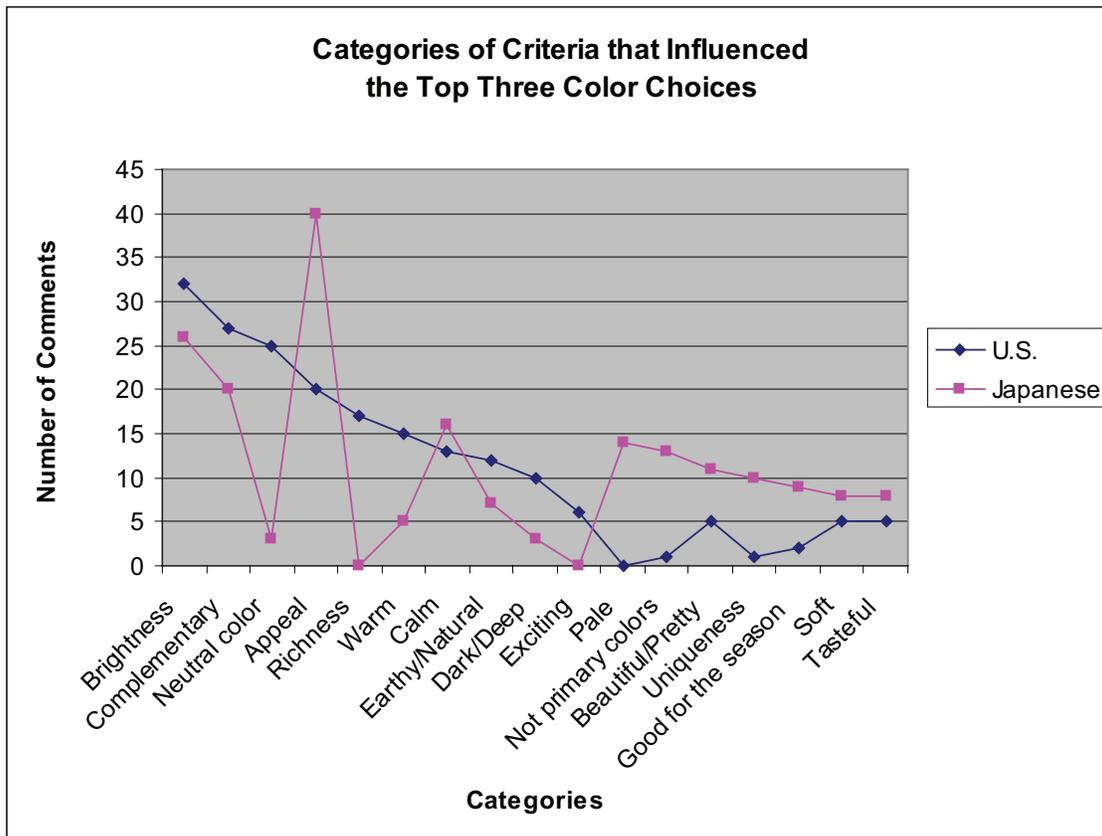


Figure 4: Top categories of criteria that influenced the top three colour preferences

Print pattern preferences

Table 3 shows the results of perceived attractiveness of print pattern stories. The only difference between U.S. and Japanese respondents' perceptions was for Busybody (t=-3.588). Japanese respondents considered this print pattern story to be more attractive than did U.S. respondents.

Table 3: Comparison of perceived attractiveness of print patterns between Japan and U.S. participants

	U.S.		Japan		T-test
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
ROMANTIC	3.15	1.76	3.04	1.67	-.465
SUBDUED	3.62	1.86	3.90	1.71	1.136
ABSTRACTED	3.70	1.70	3.96	1.55	1.152
RECOLLECTION	4.51	1.70	4.08	1.57	-1.891
BUSYBODY	4.96	1.69	4.11	1.71	-3.588 ^{***}

^{***} $p < .001$, Range: 1= Very attractive to 7= Very unattractive

The print story selected as first choice by both U.S. and Japanese respondents was Romantic (37.8% and 48.1%, respectively). The first choice among U.S. respondents was followed by Subdued (30.6%), Abstracted (20.4%), and Recollection (9.2%), while the three print stories of Recollection, Abstracted, and Busybody were tied at 13.5% among Japanese respondents.

Criteria that influenced respondents' choice of the favourite print pattern story were summarized into 24 categories. The top categories used by U.S. respondents as criteria for selecting the most attractive print pattern story were colour ($n=35$), simple ($n=21$), design/detail ($n=19$), and motif ($n=14$) (see Figure 5). The categories referred to most often by Japanese respondents as criteria for selecting the favourite print pattern story were colour ($n=33$), feminine/beautiful ($n=22$), design/detail ($n=14$), uniqueness ($n=14$), and motif ($n=13$). U.S. respondents were much more likely to use simple, design/detail, soft/calm/warm, exciting, appeal, and diverse in a story than were Japanese respondents. Japanese respondents were much more likely to use feminine/beautiful, uniqueness, bold, utility, and complementary to physical appearance and wardrobe than were U.S. respondents.

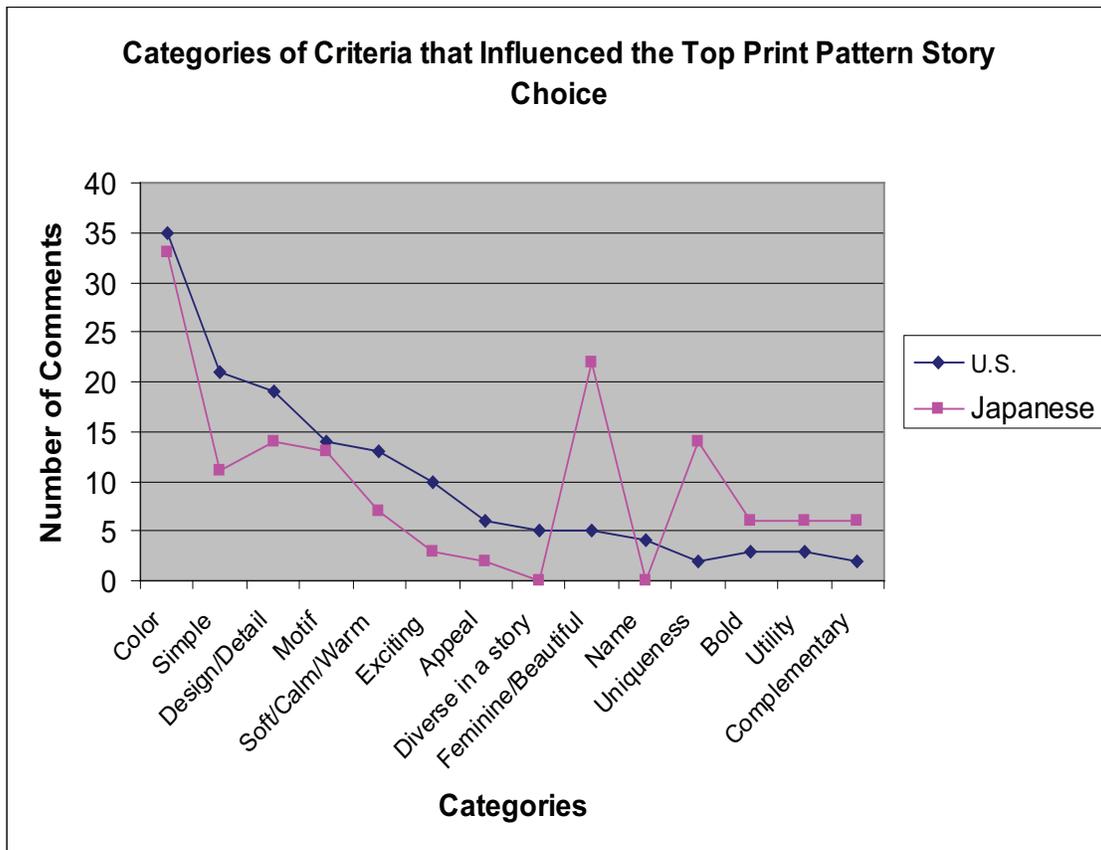


Figure 5: Top categories of criteria that influenced the favourite print pattern.

Influences of demographic and cultural characteristics on preferences

Analysis of variance (ANOVA) was performed to identify influences of demographic characteristics on preferences for the six colour stories and five print pattern stories. Demographic characteristics were composed of nationality, age, education, income, and apparel expenses. Because the majority of U.S. participants were white and the majority of Japan participants were Japanese, ethnic characteristics were considered as nationality differences.

The only demographic characteristic that influenced perceived attractiveness of colour stories was nationality. Differences between the two nationalities were found for all six colour stories. U.S. respondents considered Intrigue ($F=35.086$, $p<.001$), Provocateur ($F=12.919$, $p<.001$), and Destination ($F=5.586$, $p<.05$) as more attractive while Japanese respondents perceived Muse ($F=4.363$, $p<.05$), Triumph ($F=6.868$, $p<.01$), and Expression ($F=10.492$, $p<.001$) as more attractive.

There were three interactions between demographic characteristics and print pattern stories. Nationality influenced perceived attractiveness of Recollection and Busybody. Japanese respondents considered both Recollection ($F=4.219$, $p<.05$) and Busybody ($F=13.377$, $p<.001$)

more attractive than did U.S. respondents. Another interaction was found between age and Busybody. Respondents aged between 18 and 27 preferred Busybody more than respondents aged between 28 and 41 ($F=6.712$, $p<.01$).

Cultural characteristics were composed of risk aversion, face consciousness, sociability, and femininity. Pearson correlation coefficients were calculated to examine relationships among cultural characteristics and perceived attractiveness of colour stories and print pattern stories. Few Pearson correlation coefficients were found among cultural characteristics of U.S. respondents, colour stories, and print pattern stories. Risk aversion was found to affect positively perceived attractiveness of the colour story Provocateur ($r=.294$, $p<.01$); respondents who scored higher in risk aversion were more likely to consider Provocateur as unattractive. Sociability was found to affect positively perceived attractiveness of the colour story Intrigue ($r=.219$, $p<.05$) and the Recollection print pattern story ($r=.250$, $p<.05$); respondents who were more sociable were more likely to consider the Intrigue colour story and the Recollection print pattern story as unattractive. There was a negative influence between femininity and perceived attractiveness of the Intrigue colour story ($r=-.305$, $p<.01$); respondents who scored high in femininity were more likely to consider Intrigue as attractive.

Few statistically significant correlations were identified among cultural characteristics and Japanese respondents' perceived attractiveness of colour stories and print pattern stories. Risk aversion was found to affect positively perceived attractiveness of the colour stories Triumph ($r=.238$, $p<.05$) and Expression ($r=.334$, $p<.001$). Respondents who were more risk averse were more likely to consider Triumph and Expression as unattractive. Face consciousness was found to influence negatively perceived attractiveness of the print pattern stories Abstracted ($r=-.250$, $p<.01$) and Busybody ($r=-.262$, $p<.05$). Thus, respondents who were more face conscious were more likely to consider Abstracted and Busybody as attractive. Femininity negatively affected perceived attractiveness of the Expression colour story ($r=-.224$, $p<.05$), the Abstracted print pattern story ($r=-.268$, $p<.01$), and the Busybody print pattern story ($r=-.202$, $p<.05$). Respondents who scored high in femininity were more likely to consider Expression, Abstracted, and Busybody as attractive. However, the correlation coefficients were relatively small and may not be substantially significant.

Discussion and conclusion

Previous research found that aesthetic attributes such as colour and print pattern are important criteria in consumers' evaluation of textiles and apparel products (Eckman et al., 1990; Friend et al., 1989; Hines & Swinker, 2001; Hsiao & Dickerson, 1995; Hsu & Burns, 2002; Kawabata & Rabolt, 1999; Lee & Burns, 1993). Aesthetic evaluation of textiles and apparel products is influenced by culture (Cheng, 1997; Eckman & Wagner, 1994; Hyllegard & Morgado, 2001; Littrell, 1980; Moreno, 1997; O'Neal, 1997). However, little research has examined consumer preferences for aesthetic attributes with multiple design variables, or how culture, especially national culture, influences evaluation of aesthetic appraisals.

Research Question 1 addressed potential differences for colour and print pattern between U.S. and Japanese consumers. There were differences in aesthetic preferences for visual attributes of textiles between U.S. and Japanese respondents. U.S. respondents tended to prefer darker, low-value colours such as black, grey, and beige (referred to as basic colours).

This supports Compton's (1962) finding that individuals who score higher in sociability tend to prefer deeper, saturated colours. Also, they considered floral patterns with romantic feelings to be attractive. On the other hand, Japanese respondents tended to prefer brighter, intense colours and middle- or high-value colours such as pastel pink and yellow. Preference for pastel colours over the low-value colours and grey preferred by U.S. respondents supports Saito's (1996a) findings. Preferences for pastel colours also support the notion that the Japanese consider aesthetics as a medium to calm oneself (Hibi & Fukudo, 2000). These colours may also be reflective of those found in nature (Saito, 1996a), showing the influence of Shintoism. The only difference between the two nationalities in preferences for print pattern stories was that Japanese respondents considered the pattern with small florals in discordant colours to be more attractive than did U.S. respondents. As suggested by Kondo (1995), the Japanese population prefers unique combinations of western and traditional Japanese fashion, resulting in distinct aesthetic combinations. Preferences for small patterns support Compton's (1962) finding that the wearer wishes to make a good impression, perhaps associated with the Japanese participants' tendency to be risk averse.

Research Question 2 addressed criteria that influenced aesthetic evaluations. Although some common criteria were used by both nationalities, differences in criteria used for their evaluation of textiles existed. Both U.S. and Japanese respondents used the criteria of brightness and complementary to physical appearance and wardrobe for their colour selection, but U.S. respondents were much more likely to use the criteria of neutral colour, richness, and warm. Japanese respondents were more likely to mention such criteria as appeal of colour, pale, not primary colours, beautiful/pretty, uniqueness, and good for the season. The most important criterion for print pattern evaluation was colour for both U.S. and Japanese respondents, and there were few differences in other criteria. Therefore, the results of this study suggest that differences in aesthetic preferences toward textiles may be due to different perceptions of colour or print pattern, with the Japanese favouring unique colours as influenced by nature (Kondo, 1995).

Research Question 3 addressed the influence of demographics on aesthetic preferences. Demographic characteristics were composed of nationality, age, education, income, and expenditure for apparel. Because the majority of U.S. respondents were white and the majority of respondents in Japan were Japanese, ethnic characteristics were considered as nationality differences. The only demographic characteristic influencing colour preferences was nationality and the demographics influencing print pattern preferences were nationality and age. The results support previous research (Cheng, 1997; Hyllegard & Morgado, 2001; Moreno, 1997) which found that nationality affects aesthetic evaluations of apparel.

There were few relationships among cultural characteristics and aesthetic preferences for each nationality (Research Question 4). The cultural characteristics influencing colour preferences for U.S. respondents were risk aversion, sociability, and femininity, and the cultural characteristic influencing print pattern preferences was sociability. On the other hand, the cultural characteristics influencing Japanese respondents' evaluation of colour were risk aversion and femininity, and those influencing print pattern were face consciousness and femininity. However, no conclusive consistencies were found.

The results support the EBM model suggesting that culture impacts all stages of the decision-making process. The conclusion can be drawn that national culture impacts consumers' aesthetic preferences for visual attributes of textiles. The results also provide implications for both industry and theory development. One implication for industry is that the results can be of practical value for textiles and apparel marketers and manufacturers, including product designers and retailers. While individual differences in aesthetic preferences were apparent, results also showed that nationality influenced consumers' aesthetic preferences for textiles. Understanding the influence of nationality on preferences for products is helpful to develop marketing strategies in international retailing and design strategies for products in global manufacturing. For example, designers, manufacturers, and retailers should consider adjusting their decision making for colour and print pattern based on cultural backgrounds of their target markets.

Understanding the influence of culture, both national culture and microcultures, is not necessarily an understanding of the differences in consumers' apparel purchasing behaviour. According to Fraser and Oppenheim (1997), textiles and apparel products are in the accelerating globalization level, yet the forces of globalization are in transition. Thus, an understanding of the similarities and differences in consumers' apparel purchasing behaviour is important for success in the global market.

Although the central focus of this study was to examine the influence of nationality on evaluations of aesthetic attributes, the data identified consumers' general aesthetic preferences for visual attributes of textiles. Understanding general aesthetic preferences for textiles can help not only international marketers and manufacturers, but also domestic or local companies to provide products that satisfy the needs of their target markets. In addition, textiles and apparel companies analyze trend continuity and changes in consumer preferences (Sproles & Burns, 1994). Understanding of general aesthetic preferences could help in forecasting future fashion trends in order to provide products corresponding to consumers' wants and needs.

The implication for theory development is the nature of research on consumer behaviour for textiles and apparel products. Aesthetic attributes are important criteria when consumers select apparel. Because few research projects have examined how nationality influences aesthetic appraisals of products, the present study examined aesthetic preferences for visual attributes (colour and print pattern) of textiles. The results provided insights on some understudied areas with regard to general aesthetic preferences for textiles and apparel products, specifically the influence of national culture.

Limitations and future research

The relatively small sample of approximately 100 consumers from each country is not necessarily representative of all 18-41-year-old female consumers within the two countries, and the sizes and characteristics of the two cities may have been non-representative. However, it is feasible to formulate reasonable conclusions pertaining to the influence of nationality on aesthetic preferences for textiles. There were few differences in demographic characteristics of U.S. and Japanese respondents; thus, the data for the two nationalities were comparable. Ethnic characteristics were considered as nationality differences.

Because textiles and apparel products are globalizing, studying the same nationalities at intervals to examine if similarities in aesthetic preferences increase might be a subject for future research. Studying with a larger sample size is also recommended. A comparison of multiple nationalities in geographical areas such as Asia and Europe might identify unique tendencies in aesthetic preferences for textiles. The results identified cross-cultural differences in aesthetic preferences for textiles. The results may suggest some explanations based upon previous research on how culture influences aesthetic preferences. However, unstudied variables influencing aesthetic preferences remain. An important contribution of this study is to provide opportunities for future research to explore why the differences in aesthetic preferences occur among nationalities. Potential variables to examine include cultural values and variations in symbolism and meanings associated with colour across culture. There were differences in the average low temperatures at the data collection sites. Therefore, it is suggested that researchers plan data collection carefully such that weather be minimized as a confounding variable when comparing aesthetic preferences across cultures. Additional research that enhances understanding of the effects of cultural differences on aesthetic preferences would further knowledge of consumer behaviour and contribute to a model or theory of the consumer decision-making process and consumer apparel selection. Thus, studying the effects of cultural differences with multiple factors and analysing data with a combination of statistical and qualitative approaches are recommended.

Biography

Makiko Takagi received her Master of Science in design and merchandising from Colorado State University. She joined Synovate Market Research as a researcher in 2008 through a brand consultancy in Tokyo. Her current research areas mainly include taste and package acceptances of consumers for beverages.

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Cook It Up!: Formative evaluation of a community-based cooking program for at-risk youth in London, Ontario

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Abstract

Cooking programs targeting at-risk Canadian youth are limited in scope and opportunity. There is the need to create community-based food literacy programs with this target population. A 15-month pilot project providing educational sessions for cooking, food literacy skills, and fieldtrips to local agri-food outlets was offered to an at-risk youth population living in London, Ontario. A formative evaluation on the intervention provided valuable information that will inform future cooking and food literacy programs for this population among others.

Objectives of the intervention included the application of food literacy and cooking skills education taught by local chefs and a registered dietitian. The intervention was enhanced with fieldtrips to local farms to foster an appreciation and understanding of food, from “farm to fork”. Youth, community partners, and parents/guardians who participated in the Cook It Up! program and its development were targeted for inclusion in the formative evaluation (n = 25). As of November 2010, eight at-risk youth (five girls and three boys, mean age = 14.6) had completed the intervention.

The Cook It Up! program can provide an effective template for other agencies and researchers to utilize for enhancing existing programs or to create new applied cooking programs based on contextual information from this formative evaluation. A community-based cooking program would be relevant for a wide range of populations. Additionally, there is an ongoing need for applied research focusing on food literacy and cooking skills.

Keywords: Food literacy, cooking skills, formative evaluation, at-risk youth

Introduction

Disadvantaged youth are at a higher risk of consuming an unhealthy diet compared to youth in stable family relationships (Anderson, Bell, Adamson, & Moynihan, 2002). For the purpose of this study the term “at-risk youth” refers to adolescents aged 13-18 years, whose socio-economic status and/or living arrangements puts them at increased risk for a variety of physical and psycho-social issues, including poor nutrition (World Health Organization, 2002). Other characteristics of at-risk youth include diverse racial backgrounds; negative influence from family, environment, or peers; social factors that restrict healthy mental and social growth; limited financial resources; difficulty achieving optimal education; and behavioural issues (Dobizl, 2002; Moore, 2006; Sussman et al., 2010). At-risk youth may also experience

challenges such as addiction and homelessness (Hadland, Kerr, Li, Montaner, & Wood, 2009; Rachlis, Wood, Zhang, Montaner, & Kerr, 2009).

Supporting at-risk youth by implementing food literacy and cooking skills program can facilitate the development of hands-on learning to enhance social determinants of health in a positive way, through addressing behavioural factors like the quality of dietary choices. As such, a food literacy program can strengthen at-risk youths' food culture for health "to foster [their] knowledge of food and nutrition, cooking skills, growing food, and the social value of preparing food and eating together" (World Health Organization, 2003, p. 27).

The provision of a hands-on, practical life skills program to build food-related self-efficacy, knowledge, and self-confidence is an important and unique intervention for at-risk youth (Thomas & Irwin, 2011). According to Bandura (1977), one's self-efficacy is enhanced when one has the practical and necessary skills for completion of the task and/or behaviour. *Cook It Up!* was a community-based cooking program targeting at-risk youth and designed to provide participants with food literacy and cooking skills. This program also included opportunities for at-risk youth to enhance their self-efficacy. Offering the program is only the first step: without knowing participants' receptiveness to and experiences with the program, it is hard to know whether it should continue, be expanded, or if it has any unanticipated negative effects. Therefore, the purpose of this formative evaluation was to gain an understanding of participants' experiences with the pilot offering of the *Cook It Up!* program, where participants include the at-risk youth, community partners, and parents/guardians. As Patton (2002) and Green and Kreuter (2005) noted, formative evaluations are particularly helpful for finding out what is working well with the program, how to improve and shape the program, and also to identify what needs to be done to make it optimally effective for its target audience. The desired results of a formative evaluation are "recommendations for improvements". This study was conducted in concert with the piloted administration of *Cook It Up!* and was used to "assess the relevance, comprehension, and acceptability of activities, materials, [and] methods" of the program (Green & Kreuter, 2005, p. 207).

For the formative evaluation, the at-risk youth participants were able to share feedback about their direct involvement in the program. The community partners (i.e., Program Coordinator, Steering Committee members, fieldtrip operators, guest chefs, volunteers) contributed to the research by sharing their experiences with the organizational processes and logistics of implementing the program components. Finally, the parents/guardians had an interesting "outsider" perspective and were able to share their perceptions of the impact of *Cook It Up!* on their children. It was important to gain some idea of the program's impact on participants' food literacy and self-efficacy; therefore, a simple, self-reported tool (pre-post) to assess each was implemented. A brief description of the *Cook It Up!* program is provided for context.

Program description

Cook It Up! was a community-based cooking program targeting at-risk youth in London, Ontario. This program focused on teaching vulnerable youth essential cooking skills and food

literacy by introducing them to the local agri-food industry through fieldtrips to local farms and farmers' markets. The overall purpose of the program was to enhance food literacy and cooking skills among this population. Guest chefs from local restaurants and other food service outlets facilitated 29 educational cooking sessions focusing on local foods. Eleven fieldtrips to local farms and farmers' markets also occurred. Ethical approval for this study was granted by the Office of Research Ethics at The University of Western Ontario.

Purpose

The objectives of this formative evaluation were three-fold. First, this evaluation assessed the strengths and weaknesses of the program and its delivery. Secondly, we uncovered obstacles, barriers, or unexpected opportunities that could make the program more effective. Finally, this formative evaluation generated understandings about how the program content and implementation could be improved. As a deliverable, the research facilitated the development of a "how-to" community resource manual available for local and provincial distribution. In addition to the qualitative component of this study, a demographic survey was administered and included an assessment of self-reported food skills, food literacy, and self-efficacy (pre- and post-test questionnaires). Results from the quantitative data are reported in Tables 1, 2, and 3.

Table 1: Demographic characteristics of at-risk youth in Cook It Up!

	Demographics	<i>n</i>
Sex	Male	3
	Female	2
Age	13	1
	14	1
	15	2
	16	1
Ethnicity	White	3
	Black	1
	White/Black mix	1
Family Structure	Double parent family	3
	Parent and step-parent	1
	Single parent	1
Employed	Yes	1
	No	4
Grade	8	1
	9	1
	10	2
	11	1

Table 2: Self-reported food skills rating for pre- and post-test questionnaire

Food Skill	Pre-Test Results.		Post-Test Results.	
	Very good skill + good skill	Basic skill + very limited/no skill	Very good skill + good skill	Basic skill + very limited/no skill
	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>
Using a knife safely	3	2	5	0
Peeling, chopping, slicing vegetables or fruit	3	2	5	0
Cooking a piece of raw or frozen meat/chicken/fish (not processed)	4	1	4	1
Cooking a soup, stew, casserole using a pre-packaged mix	4	1	4	1
Cooking a soup, stew, casserole from “scratch”	2	3	3	2
Choosing a spice or herb that goes well with the food being cooked	2	3	4	1
Adjusting a recipe to make it healthier	2	3	2	3
Baking muffins or cake “from scratch”	4	1	4	1
Baking muffins or cake using a pre-packaged mix	4	1	2	3
Planning a quick, healthy meal using only the foods already at home	2	3	2	3
Freezing vegetables or fruit from raw to bagged in a home freezer	2	3	2	3
Canning fruit or salsa from raw ingredients to finished products in sealed glass jars	1	4	3	2

Table 3: Self-reported self-efficacy with respect to food literacy and cooking skills

Food skill identified	Self-efficacy	Pre-test results	Post-test results
		<i>n</i>	<i>n</i>
Preparing foods at home at least partly from “scratch”	I know I can	2	4
	I think I can	3	1
	I’m not sure I can	0	0
	I know I can’t	0	0
	I don’t know	0	0
Knowledge of what “local foods” means	I know I can	4	4
	I think I can	1	1
	I’m not sure I can	0	0
	I know I can’t	0	0
	I don’t know	0	0

Methodology

Youth, community partners (i.e., Steering Committee members, guest chefs, fieldtrip operators, and volunteers), and parents/guardians who participated in the program in any capacity were targeted for inclusion in this study. All eligible participants were invited to participate in the formative evaluation research through direct personal and/or telephone contact with the lead investigator and/or Program Coordinator of *Cook It Up!* The lead investigator and Program Coordinator explained the purpose of the formative evaluation, answered questions about the research, and provided all potential participants with the letter of information outlining the purpose of the formative evaluation and research parameters. Twenty-five participants (i.e., at-risk youths, community partners, and parents/guardians) participated in the in-depth interviews, which took place immediately following the conclusion of the *Cook-it-Up!* program, and which lasted approximately one hour; all interviews were audio-recorded and transcribed verbatim. Only the youth participants completed the demographic form and the pre-post assessments pertaining to their cooking and food literacy skills, and their cooking- and food-related self-efficacy (the pre-assessment was implemented during the second program session; the post-assessment was implemented immediately following the conclusion of *Cook-it-Up!* during the in-depth interview). The pre-post assessments were implemented orally to accommodate literacy challenges among at-risk youth.

Specific process of the formative evaluation

The in-depth interviews were conducted at a convenient and private community location as mutually decided and agreed upon by the participant and research team (e.g., local library, local community college, guest chef's restaurant, high school). Each formative evaluation participant was greeted by the lead investigator who provided him/her with another copy of the Letter of Information and re-explained the nature of the in-depth interview and research purpose. Participants were told their involvement was voluntary, that they could refuse to answer any questions, and that they could ask to stop the recording at any time during the interview. As noted above, in-depth interviews lasted approximately one hour and were audio-recorded and transcribed verbatim.

In-depth interviews were completed with a total of 25 participants (3 guest chefs, 5 Steering Committee members, 3 fieldtrip operators, 6 volunteers, 3 parents/guardians, and 5 at-risk youth participants). Saturation of the data occurred at 18 interviews; however, using principles of PAR (Kidd & Kral, 2005), the research team felt it was important to conduct interviews with *all* interested participants in order to maintain inclusiveness while furthering the opportunity to obtain rich, contextual data about *Cook It Up!*. A semi-structured interview guide was used to facilitate the in-depth interviews. Examples of questions from the semi-structured interview guides for at-risk youth, community partners, and parents/guardians appear in Table 4.

Table 4: Example questions from semi-structured interview guides for at-risk youth, community partners, and parents/guardians

At-Risk Youth	<ul style="list-style-type: none"> • What did you like best or value most about the cooking program? Why? • What did you like least or value least about the cooking program? Why? • If you could change anything about the program, what would it be? • What is different for you since being in the <i>Cook It Up!</i> program? What, if anything, is different about how you're eating? What, if anything, is different about where you're purchasing? • What recommendations would you make to improve this program so it could be adapted to other target groups in other communities?
Community Partners	<ul style="list-style-type: none"> • Why did you become involved in the <i>Cook It Up!</i> program? • How effective was the Steering Committee in meeting its objectives for this project? Please say more? • What recommendations would you make to improve this program? • How could this program be adapted to other target groups in other communities?
Parent/Guardians	<ul style="list-style-type: none"> • Why do you think your child wanted to participate in the cooking program? • What do you think your child liked best or valued most about the cooking program? Why? • What did you like best or value most about the cooking program? Why? • Why was it good for your child to be a part of <i>Cook It Up!</i> What did you gain from the program? • In what ways could the cooking program be improved? If you could change anything about the program, what would it be? • What is different for you since your child was involved in the <i>Cook It Up!</i> program? What, if anything, is different about how you and your family are eating? What, if anything, is different about where you're purchasing food?

Data analysis

Upon completion of data collection, descriptive statistics were conducted on the pre-post assessments, and inductive content analysis as described by Patton (2002) was utilized to analyze, code, and categorize emerging themes for the qualitative data. QSR NVivo 8 (QSR International, 2008) software was used to help code and categorize emerging themes. All themes were presented as group findings to keep confidentiality of identities intact. Several strategies, as outlined by Guba and Lincoln (1989), were employed to ensure the trustworthiness of the findings (see Table 5).

Table 5: Measures to facilitate data trustworthiness as outlined by Guba & Lincoln (1989)

Credibility	Member-checking was used between each question and at the end of the interview to ensure the responses from participants were correctly understood and recorded by the researcher. The lead investigator provided her perception of the participants' responses prior to moving onto the next question in the semi-structured interview guide.
Dependability	Following the interview, the lead investigator and a member of the research team met to debrief and summarize the interview. A colleague not involved in this study was recruited to engage in peer-debriefing sessions with the researchers following the interviews. Detailed notes from this discussion were recorded and any biases identified, documented, and considered to ensure the researchers' biases would not affect the data analysis. Detailed notes also provided an audit trail. During the data analysis, the lead investigator also engaged in reflexivity to help keep any biases in check.
Confirmability	Inductive content analysis was performed independently and simultaneously by two researchers with experience in qualitative research and the findings were then triangulated and analyses compared. Data were examined for similarities and differences and emerging themes identified. Another member of the research team reviewed the data and engaged in peer debriefing with the research team to ensure that any of the researchers' biases that were taken for granted have been uncovered. Additionally, through this process, the researcher can become aware of her position toward the data and its analysis.
Transferability	The entire research process has been documented in detail to allow other researchers to determine if the context and findings from this study are transferable to their contexts and settings.

Findings

A summary of participants' demographics is found in Table 1. In terms of the quantitative (descriptive) tools, a summary of the pre- and post-test cooking skills assessment is found in Table 2. In general, all participants identified an increase in their cooking skills acquisition from pre-test to post-test (see Table 2) and indicated an improvement in food literacy and self-efficacy with respect to cooking skills (see Table 3).

In terms of the qualitative findings, a number of themes emerged from the data related to the pilot program components and attributes, the impact of the program on at-risk youth participants, and future program considerations. These broad themes were not decided upon

prior to conducting the interviews, but instead materialized from the data and underscored key concepts related to the intervention, the utility of the intervention, and the value of the community-based cooking program for at-risk youth from the participants' perspectives. The specific themes that emerged from the data were food literacy, connections, confidence, youth engagement, relevance, at-risk youth behaviour, and location.

Food literacy

Nineteen of 25 participants (i.e., at-risk youth, community partners, parents/guardians) interviewed for the formative evaluation mentioned the importance of food literacy for the at-risk youth population, and among other populations. Comments related to food literacy focused on increased awareness of the relationship between the local agri-food industry (i.e., access and availability of foods from local farms and farmers' markets) and cooking, learning about food and cooking, and the progression of cooking skills. One volunteer summarized her view of the youths' understanding of food literacy by stating, "the light bulb goes off [with the youth when they say] 'oh this is how it's grown' and 'this is how I pick it and now I'm going to go back and prepare it'... every time you go you see the kids - they are blossoming." This was echoed by a parent, who stated:

I think it was a combination of following the fieldtrips with the produce and following it through and cooking it. I think she [daughter's name] really enjoyed that aspect of it, like going to the grocery store and getting the chicken and cutting it all up. She didn't really like that but she did it!

A Steering Committee member also appreciated the enhancement of food literacy experienced by youth participants through their involvement in *Cook It Up!* She stated:

...the participants that we have currently [are] coming away with a better understanding of the food that they eat and how to prepare it. The spin-off of that is that they are going to be an influencing factor in their own families and to their friends, and hopefully as they grow older and have families of their own these [skills] are going to live on and transfer down [to their children].

Several participants stated there were numerous opportunities to learn about food literacy and cooking skills, primarily championed by the guest chefs. When asked what she thought was the best part of *Cook It Up!*, the mother of one participant stated:

[T]hat he was learning. That he had the desire to go. He was more interested in foods. I know he talked to his grandmother and his aunts about his class... so he really liked it because he would talk about it.

One of the guest chefs involved in the program indicated:

[N]one of them [youth participants] had actually gone apple picking before. None of the kids had been on a real farm. They had never seen food grown;

they had never seen livestock up close.... We are trying to impart knowledge. We are trying to impart professionalism. We are trying to impart skills.

The opportunity to learn about food and cooking was explained by one guest chef through an explanation of skills acquired by at-risk youth thus:

[W]e've taught the kids how to respect a knife and how to respect their boards and keep things clean.... So we give them an idea of what they are going to make today and we talk to them a bit about the history of what we are making and why we are making it and then we go through the process of making it and then we give them the reasons why we are making the different processes and things to that effect.

It was important to the Program Coordinator and guest chefs to see that the participants had a good understanding of the historical context of the food they would be cooking as well as how it related to the seasonal availability of produce. One stated:

I like the mix of sessions between [cooking and] field trips because it's like practical outside of the kitchen and then in the kitchen. It does take the whole local foods concept...taking them on a field trip is really great... [t]hose are all strengths of the program.

Finally, the progression of the participants' cooking skills might be linked to enhancing their food literacy. If the program was to be successful, an outcome related to cooking skills progression would be revealed. The Program Coordinator stated, "It's been really fun to watch the kids' interest change through the program so it's been really fun to watch their skills grow." He explained, "[I] just listen to the way that they understand food, listening to them answer the guest chefs' questions faster and more enthusiastically than they were at the start which - it's been fun to watch them grow as a group." From an at-risk youth participant's perspective, the progression of cooking skills was evident as well. She stated:

[Chef] has even told me that [my skills have] improved, like my knife-handling skills and stuff like that. He said when I first grabbed a knife I could barely use it but now I'm a lot better with them and he doesn't think I'm going to cut myself anymore...I can follow a recipe a lot better now too. Before I could follow a recipe but now it's more, like, I don't have to read the recipe for each ingredient. Like, I can just look over it really quickly and then I can make it, type of thing.

Another youth participant indicated a similar sentiment regarding how her cooking skills progressed over the course of the intervention. She stated, "...having someone constantly critiquing [your cooking skills] and showing you 'do it this way'...they are constantly telling you that it kind of sticks in your head more." Similarly, one participant indicated, "[I liked the] hands-on aspect...I had to be shown it first and then it's ingrained in my head."

Connections

Related to food literacy is the theme of connections. Specifically, the themes of connections between farms and farmers, connections to community members, and connections to food each emerged from the data. The Program Coordinator succinctly summarized his perspective about connections, stating:

I think one of the big things that I personally believe when it comes to food is the more of a connection that a person has with the food that they are eating, the more into it they are going to be. It becomes an experience as opposed to just a meal.

Building on the connection to food, one at-risk youth participant, whose sentiments were consistent with her peers, said, “you got to see where all the food came from and like the process of how it’s grown, which is kind of cool because if you are not exposed to that [it’s not good].” A Steering Committee member agreed with the importance of connections to local farms and farmers, stating:

...it’s all about that connection with your food. So when you bring kids who have never really connected with anything they are eating before, especially when you are trying to get them to explore new ideas with food and new concepts with food...when they are the ones that prepared it, [it] really makes a huge difference in how they will look at that food and look at that experience when you can take it that step further and you actually bring them out to the source of the food and they see it growing. They can’t help but have that affect them in a way where they are like ‘Wow, this is something that I pulled from the ground.’

The importance of community connections also emerged. A member of the Steering Committee indicated that community involvement was the key reason for the success of *Cook It Up!* This person said:

I would say that if you take a look at the interest that has been shown by all of the different community partners and people who are involved, without all of them it would not work...there’s a whole network of people working together to make sure that this program is delivered and delivered well. And if you take any one of them out of the equation, I’m not sure how it would work.

Cook It Up! provided connections with the at-risk youth as well, mainly through the Program Coordinator and guest chefs, but also with the introduction of at-risk youth to local farms and markets. A volunteer noted, “the enthusiasm of the people that are involved and how that has—it sparks the enthusiasm in the kids... [i]t’s like turning on the light.” The youth participants felt similarly, as exemplified by one participant who stated,

[T]he field trips were really cool because we went to like organics farms and we went apple picking and strawberry picking and all kinds of stuff like that

so you got to see where all the food came from and like the process of how it's grown, which is kind of cool because you are not exposed to that.

Confidence

The theme of confidence was expressed by community participants, parents/guardians, and the at-risk youth themselves as they described the benefits of *Cook It Up!*. Throughout *Cook It Up!*, at-risk youth participants reportedly improved their self-esteem and correspondingly their confidence in the kitchen and in themselves. One at-risk youth participant stated, "It's made me more confident in the kitchen, definitely. I don't feel like I am going to burn the house down any more!" One of the volunteers who had professional experience as a teacher of children with special needs indicated:

[W]hen you see what's happening with the kids in the program and you see that you have been a part of helping them to see that they can achieve things and it's possible [for them] to feel good about themselves.

In discussing the positive impact *Cook It Up!* had on her child, one of the parents/guardians indicated, "This [program] was just 100%. If you reached one child during this whole thing...I think that this has changed [child's name] life... [increasing her] self-confidence and someone listened to her and discussed ideas with her. And she counted." A program volunteer indicated she had noticed youth "changed so much in this program...it's like them becoming responsible for themselves which is becoming an adult. Kids gained more confidence and comfort in their skill and their abilities."

Youth engagement

Youth engagement was another emerging theme. A parent of one at-risk youth participant indicated that his daughter enjoyed being:

...involved in the ideas of what some of the side trips were and cooking projects. She really liked the idea of that...I can see that this course has developed leadership qualities in her...she didn't have that incentive before this *Cook It Up!*

A guest chef involved in the program stressed the importance of youth engagement by the participants when he stated:

...it's a set of kids that are there to learn, not just there because of money. Their mom and dad didn't send them. They are here by choice. When you are here by choice, you have a tendency to learn more.

This chef felt that the participants' commitment to the program underscored their efforts for engagement throughout its duration. When it came to their perspective of engaging in the program and its various activities, youth themselves reported feeling interested and excited to participate. This was evident through the quote of one youth participant who said:

...now that I have these skills, I am going for my Food Handler [Training certificate] and I've been taking cooking at school...I have better confidence. I can get a job at a restaurant easier than say somebody who is just taking cooking at school...I have that much more experience.

Relevance to others

All participants in the formative evaluation were asked about the potential relevance of *Cook It Up!* to other populations and groups. All respondents indicated that a wide range of diverse groups could benefit from a cooking skills and food literacy program like *Cook It Up!*. One at-risk youth participant, whose sentiments reflected those of his peers, indicated, "I think that everyone can benefit from knowing how to cook their own food from scratch." Virtually every age group, from students in elementary school, high school, university and college to teenage mothers, professional adults, and older adults, were mentioned by participants in the formative evaluation as prospective groups to benefit from an intervention similar to *Cook It Up!*

At-risk youth behaviour

The Program Coordinator, guest chefs, volunteers, Steering Committee, and some at-risk youth participants experienced difficulties with the behaviours of some at-risk youth participants in the program. One of the volunteers with expertise working with at-risk youth kept challenging situations in perspective. She stated:

[W]ho knows what goes on at home, right, and who knows what kind of consistency they have in their life, so for the same people to show that dedication and come and spend that Monday night with them is probably maybe the only time that they have had that in their whole lives.

Her colleague added:

[T]here's times when we forget or don't really understand some of the challenges that the youth that we are dealing with have so there may be some behaviour or lack of attendance or focus at a session and we have to remember that we are dealing with youth that are probably facing some challenges that we are not all that privy to, so we are just, you know, and we have to keep that in mind. We have to remember who we are dealing with.

Having this perspective helped facilitators of the cooking sessions and fieldtrips have a better understanding of this unique population and increased their comfort level when working with at-risk youth, as evidenced by one volunteer who stated:

I think that there's a couple of kids that have had some issues with organization and with obviously have problems with authority. Probably they've had a lot of, I would think that they would have family issues, they have behavioural issues. And I think a couple of them we had to kind of fight to keep in the program because, you know, people were seeing them as

disruptive influences. I think it's worked out and it's been good for everybody to see that you don't give up right at the beginning. You know, you plough through and you persevere with those kids and you do get rewards...they need a little [tender loving care] to get them on the track.

A Steering Committee member agreed that the whole team handled the challenge of working with at-risk youth very professionally and effectively. She stated:

I think we've worked very well with dealing with all of these challenges...We are very fortunate there that we've got a diverse mix of people making that up who can come in and have expertise in dealing with youth either as a teacher or a service provider for at-risk youth.

As mentioned above, some of the youth themselves found behaviours of other participants to be challenging. One youth participant described this situation stating, "there are some kids that it was just like kind of avoid them...don't pretty much engage with them too much."

Location

The greatest challenge was securing a satisfactory location for the initiative. The *Cook It Up!* program participants (Program Coordinator, guest chefs, volunteers, and at-risk youth) needed to exercise flexibility with respect to the location as it was changed on four different occasions over the 18-month duration of the program. Finally, the Steering Committee was fortunate to secure a centrally-located industrial kitchen in a faith-based organization easily accessible by bus. One volunteer stated, "the biggest challenge has been finding a home for the program...it's difficult for kids and their parents to be in the different kitchen and the different venue, you know. I think it's hard - those kids crave familiarity and consistency."

Discussion

The findings from this formative evaluation suggest that the *Cook It Up!* community-based cooking program for at-risk youth was an important intervention to facilitate teaching at-risk youth about food literacy and cooking skills. This intervention might assist participants' connections to local agri-food industry while building essential life skills, self-confidence, and self-efficacy. The application of food knowledge from "farm to fork" (i.e., food literacy skills) is relevant not only to the at-risk youth population in the current study, but also for other populations. Having community connections with experts in the field working specifically with the new population would provide an enhanced understanding of the target populations' specific needs and facilitate program success. A centrally-located, accessible location was seen as a necessary component of the program for youth participants, volunteers, and guest chefs alike. An appropriate location was an ongoing concern during the *Cook It Up!* program; however, the Steering Committee eventually acquired the ideal site thus alleviating the stress of implementing the intervention in a less suitable location.

The findings of the current study are meaningful because they contribute to the limited evidence about food literacy and cooking skills. These findings also provide participants' perspectives of the need for continued skill development to many target groups. Educational

programs focusing on cooking skills provide the opportunity to enhance and improve participants' self-efficacy while teaching basic food preparation and healthy nutrition behaviours and practices in a hands-on environment. The literature indicates programs designed using these components are well received by participants and facilitators (Byrd-Bredbenner, 2004; Haley & McKay, 2004; Lai Yeung, 2007; Levy & Auld, 2004; Meehan, Yeh, & Spark, 2008; Winter, Stanton, & Boushey, 1999; Wrieden et al., 2007).

Throughout the entire intervention, confidence among at-risk youth participants was explored, developed, and enhanced, and confidence is one of several key ingredients for positive youth development (Lerner, Fisher, & Weinberg, 2000). Youth engagement can be defined as "the meaningful participation and sustained involvement of a young person in an activity, with a focus outside of him or herself" (Centres of Excellence for Children's Well-Being, 2009). Youth were consulted at all stages throughout the intervention, including for recipe selection, field trip ideas, and content development for the program curriculum.

Along with the outcomes of achieving enhanced cooking skills, food literacy, self-confidence, and self-efficacy, other outcomes of importance were realized in this intervention. For example, *Cook It Up!* facilitated the opportunity to explore the relationship of cooking skills and the possibility for improved nutrition and healthy eating outcomes. When individuals follow *Eating Well with Canada's Food Guide* (Health Canada, 2007a), they are better equipped to obtain sufficient vitamins, minerals, and other nutrients; reduce the risk of type 2 diabetes, obesity, heart disease, certain types of cancer, and osteoporosis; while achieving overall health and vitality (Health Canada, 2007b). However, consuming unhealthy diets has resulted in the increased incidence of excess weight and obesity, especially among Canadian children and youth (Biro & Wien, 2010; Lee & Cubbin, 2002; Shields & Tjepkema, 2006; Taylor, Evers, & McKenna, 2005). Greater risk of obesity in children is correlated with higher consumption of sweetened beverages (Ludwig, Peterson, & Gortmaker, 2001; Statistics Canada, 2008), increased intake of oils and fats (Statistics Canada, 2006), and increase in the total calories consumed (Statistics Canada, 2006).

While poorer eating patterns are associated with excess weight and obesity, *healthy* eating patterns are associated with positive outcomes including healthy weights. For example, eating more servings of vegetables and fruit is linked with healthy weights, weight loss, and better weight management (Rolls, Ello-Martin, & Tohill, 2004). One impediment to establishing healthy eating is related to the ability to prepare nutritious foods. A cooking skills and food literacy program similar to *Cook It Up!* might improve cooking skills and encourage the consumption of healthy foods. Consequently, cooking skills programs might help in the achievement and maintenance of healthy bodyweight.

Another implication of improved cooking skills relates to opportunities to enhance community food security. The Community Nutritionists Council of British Columbia (2004) stated that community food security "exists when all citizens obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone" (p. vii). The foundational goals of community food security are diverse and include components relevant to cooking initiatives. For example, the need to "enhance the dignity and joy of growing, preparing, and eating food"

(Dietitians of Canada, 2007, p. 2) and “build the capacity for people to create change through education and empowerment” (Dietitians of Canada, 2007, p. 2) reflects goals shared by food literacy and cooking skills programs. These programs can be designed to include education and awareness of food production and preparation, from the farm producing the food to an individual’s kitchen where it is prepared. Food literacy and cooking skills programs might improve opportunities to achieve food security, especially for vulnerable populations at greatest risk.

Food literacy and cooking skills are essential for a number of reasons. Lang and Caraher (2001) highlighted that cooking skills underscore one’s ability to acknowledge what constitutes a healthy diet; they also enable and empower individuals to make healthy and culturally preferred food choices both by having the ability to prepare food from “scratch” and by understanding the process by which ready-to-prepare foods are made (Lang, Caraher, Dixon, & Carr-Hill, 1999). Youth, especially those at-risk for failing to achieve the positive social determinants of health, require being equipped with an essential set of practical skills such as food literacy and cooking (Thomas & Irwin, 2011). These skills may facilitate at-risk youths’ ability to make healthy food choices while reducing their risk for chronic disease, achieving and maintaining a healthy bodyweight, and contributing to acquiring food security.

Limitations

Cook It Up! provided a hands-on initiative for at-risk youth to gain essential food literacy and cooking skills in a supportive environment which fostered their self-esteem and confidence. The limitations of this study focus on the small number of participants in the intervention itself. Of the 25 participants involved in the formative evaluation, only 5 participants were at-risk youth themselves, the main target population for the *Cook It Up!* intervention. There was a total of eight at-risk youth who were involved in *Cook It Up!* when it was conducted from August 2009 to November 2010. With this small number of at-risk youth participants in the formative evaluation, we cannot confirm the opinions of the other three participants, let alone those at-risk youth who did *not* become involved in *Cook It Up!* at any time throughout its duration. It would be interesting to know what other at-risk youth would have shared about this unique initiative, and if they did not become involved, why they were not interested in participating in this intervention. Perhaps there would be a more efficient or effective way to reach these at-risk youth, either in the community environment or alternatively through recruitment in a school setting.

Additionally, a small number of parents/guardians participated in the formative evaluation. It is difficult to make any recommendations based on perspectives from only a few parents/guardians. While this information was interesting, it would have been useful to have the opinions about the *Cook It Up!* program presented by other parents/guardians involved in the intervention. Their lack of involvement might reflect their at-risk characteristics as well, which may have contributed to their barrier to participation in the formative evaluation. Regardless of the small sample size of participants in this research, however, the contextual information provided shapes future food literacy and cooking skills development programs targeting at-risk youth.

Conclusion

This formative evaluation assessed the strengths and areas for improvement of the community-based cooking program for at-risk youth and its delivery. Through this assessment, we uncovered barriers and opportunities that served to make the program more effective. Finally, this evaluation engendered insight about how the program content and implementation could be improved. The research facilitated the development of a “how-to” community resource manual available for local and provincial distribution. To date, this initiative has been adapted by a number of agencies locally and provincially (i.e., Youth Opportunities Unlimited, Children’s Aid Society, Cross Cultural Learners Centre, and the North Bay and District Health Unit). *Cook It Up!* provided a useful template to be shared with other agencies and groups interested in improving food literacy and cooking skills among their target populations.

School- and community-based cooking programs for youth provide numerous benefits, including the development of necessary life, social, and economic management skills, and education about healthy eating in service of improving weight status and overall health (Byrd-Bredbenner, 2004; Lai Yeung, 2007; Larson, Perry, Story, & Neumark-Sztainer, 2006; Larson, Story, Eisenberg, & Neumark-Sztainer, 2006). With the cooking skills syllabus removed from the curriculum from several North American school systems, fewer opportunities exist for youth to learn and apply basic food-related skills such as proper food selection, preparation, storage, and usage. This “de-skilling” of food and cooking demonstrates the need to expose youth to cooking/culinary and food literacy programs. The creation of food literacy and cooking programs using existing culinary infrastructure and linking with experts in the community (e.g., local guest chefs and farmers) might be a solution to facilitate the provision of these important skills to this population and others. In the process, food literacy and cooking skills development programs also will improve attitudes, self-efficacy, nutrition knowledge, confidence, and perceived cooking ability (Thomas & Irwin, 2011).

Youth represents a key period for social and biological development which can impact health-related behaviours and beliefs (Ruland, 2005). Lang and Caraher (1999) acknowledge health promotion as paramount for changing knowledge, attitudes, and behaviour, and food literacy and cooking skills provide a catalyst for the intersection of all three. Health professionals are in a position to advocate for the inclusion of cooking skills programs to re-skill an already vulnerable youth population with limitations in food literacy and cooking skills development.

Biography

Dr Heather Thomas is a Registered Dietician at the Middlesex-London Health Unit and Adjunct Professor at Brescia University College, affiliated with Western University (formerly called The University of Western Ontario). Heather researches and writes about food literacy as it impacts youth and applies this program of study to her practice in public health nutrition. She is actively involved in her provincial association, the Ontario Society of Nutrition Professionals in Public Health, the official voice of Registered Dieticians working in public health in Ontario.

Dr Jennifer Irwin is an Associate Professor in the Faculty of Health Sciences, School of Health Studies, Western University (formerly called The University of Western Ontario). She is also a certified life coach with the International Coach Federation and has focused training in Motivational Interviewing. While her research focuses primarily on obesity prevention and treatment, her areas of specialization include: Motivational Interviewing and life coaching for health-related behaviour change (e.g., obesity- and smoking-related behaviours) and the promotion of physical activity and healthy dietary intake behaviours.

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***Functional apparel for cosmetologists:
User assessment of developed product function***

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Abstract

The purpose of this study was to assess the functional attributes of apparel developed for cosmetologists in order to establish the acceptability of the product by potential consumers of small-, medium-, and large-size categories. The study was carried out in Lagos, Nigeria. The population comprised 3820 cosmetologists. Purposive sampling technique was employed to select 24 cosmetologists as study participants. The instrument of study was a 23-item Functional Apparel Design Assessment Instrument for Cosmetologists (FADAC). The internal consistency of the instruments was established using Cronbach alpha coefficient. One research question and one hypothesis guided the study. The research question was answered using means and standard deviations while the null hypothesis was tested using Analysis of Variance (ANOVA) at .05 level of significance. Results indicated that small-, medium-, and large-sized cosmetologists did not significantly differ ($p > .05$) in their mean ratings on mobility ($F = 2.227$; $p = .113$), comfort ($F = 1.400$; $p = .269$), or protection/safety ($F = 1.750$; $p = .198$). The implementation of the findings of this study will facilitate large scale production of occupational apparel that will meet design and human factors within the cosmetology workforce.

Keywords: Cosmetologists, functional apparel, user assessment, product function

Introduction

Cosmetology is the treatment of hair, skin, and nails, using cosmetic applications to beautify and improve appearance. It involves the use of equipment and tools which may pose work-related hazards if not handled and stored properly. Cosmetology affords enormous employment opportunities for numerous men and women both in Nigeria and globally. In the United States alone, according to the United States Board of Labour Statistics (2008), over 825,000 people are registered as workers in the cosmetology industry either as barbers, skin care specialists, or nail technicians. In Nigeria, the National Directorate of Employment (NDE) (Federal Republic of Nigeria, 2006) in collaboration with Ministry of Labour and Productivity (National Labour and Productivity Manual, 2006) reported an estimated 24,020 registered cosmetologists. Out of this number, Lagos State alone registered 3,820 cosmetologists. Cosmetology has remained a huge fashion-oriented and beauty care enterprise over the past decades, as it plays a key role in people's lives and well-being.

Within the cosmetology work environment the activities, facilities, equipment, tools, chemicals and other materials necessitate the use of special clothing that should be compliant with user needs. This is because clothing can enhance or hinder body functions

among different groups of people and in different occupations. In a needs-assessment study previously carried out on cosmetologists' functional apparel, participants indicated that they are exposed to water/chemical splash on the body and clothes, discomfort with regular clothing, problems with handling of tools, and repeated movements around the work environment. In a study carried out by Barker (2007) on police officers' vests, respondents indicated that the ballistic vests designed for them inhibited their movement on a number of activities. In a study of soccer uniforms, Holland (2007) observed that the need for increased research on measures of mobility to enhance performance and integrity of functional apparel products is pertinent.

According to Barker (2007), functional apparel serves as protection for the wearer from environmental conditions as well as work- or task-related conditions that expose wearers to certain risks in operation. Task-related protection requires a wide variety of clothing, each item designed for a specific end use. Branson and Sweeney (1991) therefore propose that person attributes, clothing attributes, and environment attributes influence comfort. McCullough, Kwon, and Shim (2003) state that protective clothing systems often contribute to heat stress when worn by people in hot and humid environments, and/or at high activity levels. Research, according to Fowler (2003), indicates that clothing that is not comfortable will not be worn or accepted in totality; however, such uncomfortable clothing items could be made more comfortable by the creative abilities of the wearers, or could be rejected outright. These conditions pose major challenges in selection and usage of functional apparel (apparel designed to meet special needs of persons in diverse situations). A design process framework is often used in the development of functional apparel.

The establishment of a school of Cosmetology in Nigeria as far back as 1959, about five decades ago, has resulted in the emergence of many individuals practising the trade. They operate in a free market situation where laws and regulations guiding the industry operation are not properly spelt out. As a result, this industrial sub-sector is flooded with all kinds of workers who are non-professionals and become exposed to various environmental hazards that may impede job performance and present a poor corporate image. It is therefore necessary for workers in this industrial sub-sector to have a corporate identity through the use of a common apparel to address uniformity in appearance and efficiency in operation (Osinsanya, 2005). It has also been observed that manufacturers of beauty supplies in the cosmetology trade have attempted to design various forms of protective clothing for cosmetologists but the total functionality and appropriateness of the product to the work environment is still not readily attained. It was also observed by the researcher that the occupation of cosmetology as practised in Lagos does not lay emphasis on dress code to cater for the activities and professional image of the trade. Consequently, cosmetologists in Lagos lack existing functional apparel for their operations.

The thrust of this study (which is part of a bigger study) utilizes the final stage of the functional design process framework (FDP) of Dejonge (1984). The preceding stages of the design process take the designer step-by-step from the initial idea through an evaluation of the final idea. The first step of Dejonge's design process is the general request, or a broad problem statement of the clothing need. The request can be a general statement of the objectives made by the designer or an expression of need from the wearer. This step can

incorporate brainstorming, user interviews, and observations of garments and the wearer (Dejonge, 1984; Fowler, 2003). The next step is the exploration of the design situation, which involves statement of objectives, literature search, and further definition of the problem. Further observations or market analysis could also be part of this step (Bergen, Capjack, McConnan, & Richards, 1996). The problem structure is perceived through an assessment of critical factors. A designer may find needs assessment, movement analysis, thermal assessment, impact assessment, and socio-psychological assessment helpful at this stage (Dejonge, 1984). The next step is that the design specifications and criteria are established, including functional and psychological requirements. It may be necessary to prioritise the criteria. When the prototype is developed, it should be evaluated against the design specifications and fit-tested for suitability in optimum performance. After the prototype is evaluated, the final design development occurs. There should be an objective evaluation of the final design, which may include a range of motion test, video analysis, comfort testing or movement analysis (Huck, Maganga, & Kim, 1997). There may also be a subjective user-evaluation to complement the objective evaluation of the design (Dejonge, 1984). This whole process framework is to make designing better and responsive to user needs.

The purpose of this study therefore was to subjectively assess the functional attributes of prototype apparel developed for cosmetologists in Lagos, Nigeria. Specifically, the study determined the mean ratings of functional apparel users (small, medium, and large) on functional criteria of movement/mobility, safety/protection, and comfort.

Methods

The study employed a research and development design. It was conducted in Lagos State. The population used for the study was 3,820 cosmetologists. Purposive sampling technique was used to select 24 cosmetologists who responded to the research instrument. The instrument, face-validated by five experts, was used for data collection. This was a 23-item Functional Apparel Design Assessment Instrument for Cosmetologists (FADAC). The internal consistency of the instrument was established using Cronbach alpha coefficient for various clusters of FADAC: mobility, comfort, and safety/protection criteria. The values were 0.81, 0.71, and 0.76. The research questions were answered using means and standard deviations, while the hypothesis was tested using Analysis of Variance (ANOVA) at .05 level of significance.

Product design and development

The researchers brainstormed over design ideas to arrive at a final design that could best capture the performances of cosmetologists regarding functional apparel for usage in their occupation (see Figures 1-6). Patterns were developed for this final design idea based on the mean measurements that were earlier obtained in the first phase of the study in small-, medium-, and large-size categories. The pattern-making principles of Armstrong (2010) were adopted and used to produce the final pattern for the prototype apparel. The apparel product was then constructed in small, medium, and large sizes, with apparel construction methods outlined by Glock and Kunz (2000). Study participants were thereafter asked to assess the developed product.



Figure 1: Cosmetologist with developed functional apparel set (shirt, pants and apron)



Figure 2: Cosmetologist without protective apron in a warm saloon environment

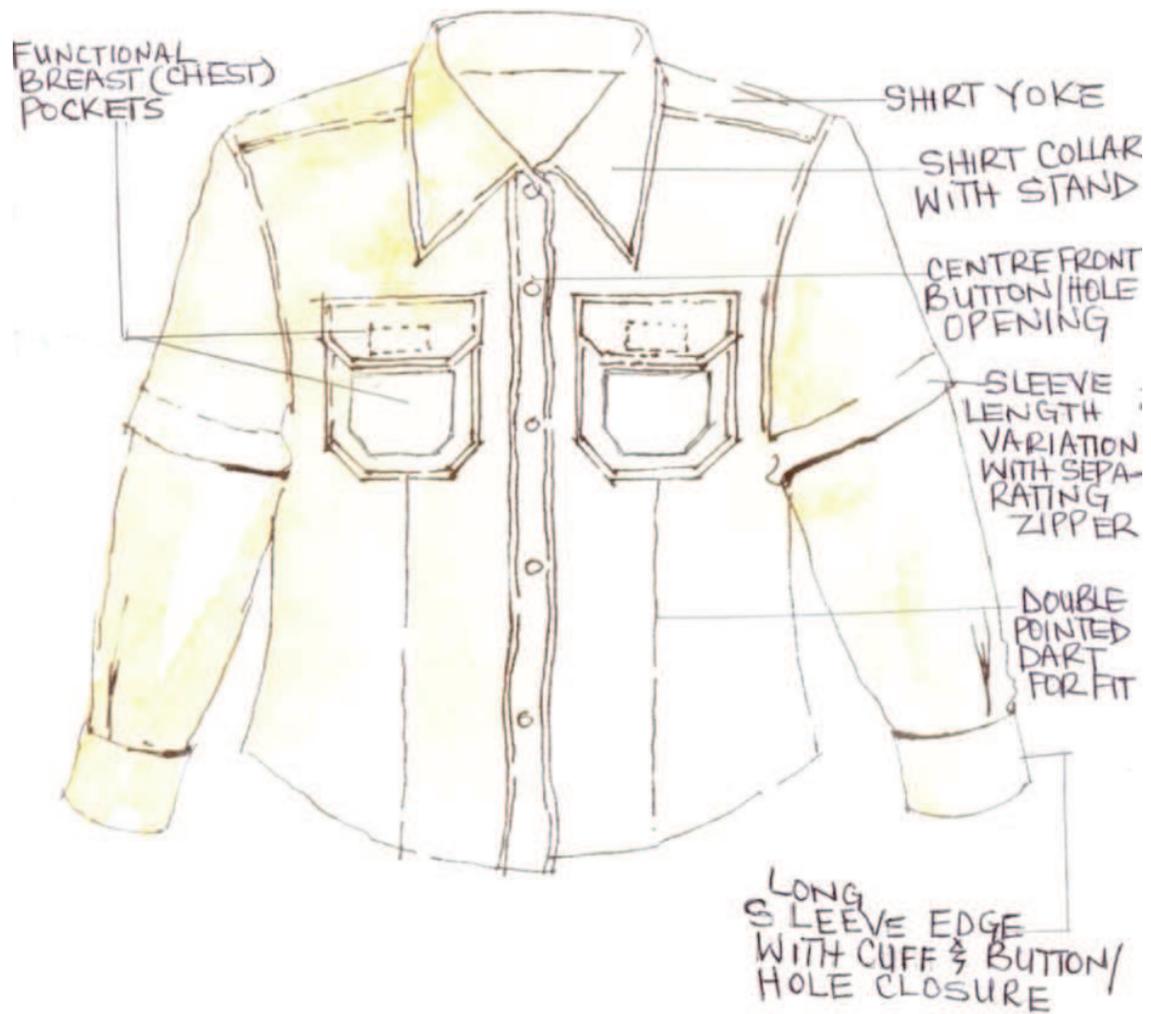


Figure 3: Shirt - front view



Figure 4: Pant - front view

SIDE VIEW OF PANT

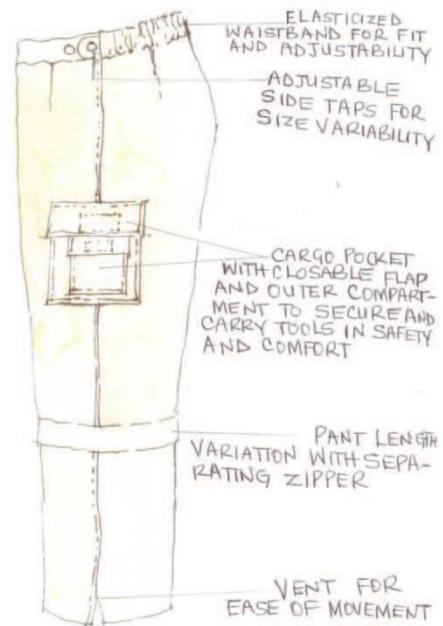


Figure 5: Pant - side view

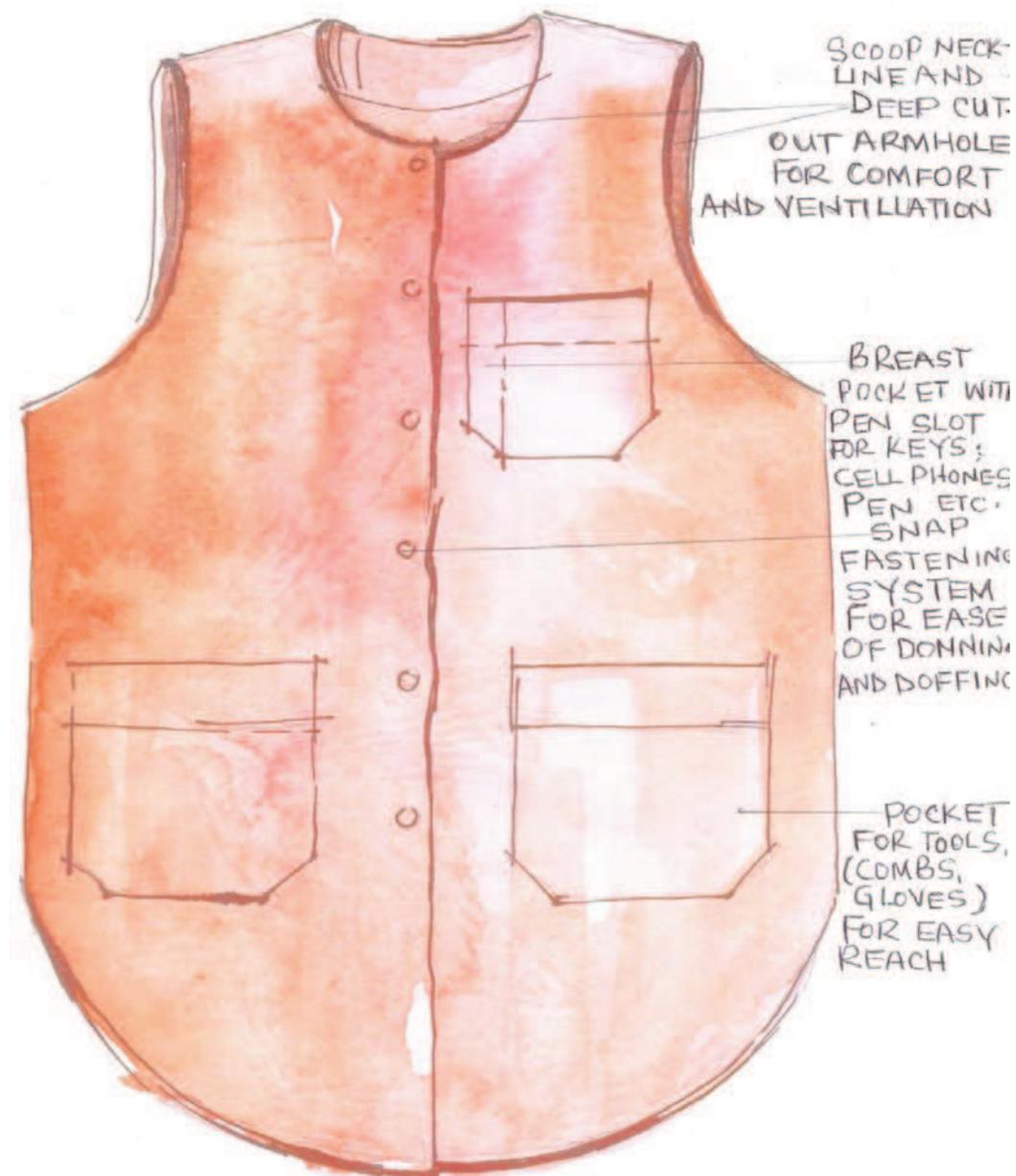


Figure 6: Apron made with water repellent fabric

Assessment/scoring of the functional apparel product

Each of the 24 cosmetologists' models was given the FADAC instrument to go through before completing it. The movement assessment interview was conducted by the researcher for the models. After each movement, subjects rated themselves on a 5-point Likert-type scale to determine "how easy or how hard" it was to perform the movements wearing the functional apparel product. After the interview session, subjects were allowed independent time to rate the functional apparel product on movement/mobility, comfort, and safety/protection attributes, in a laboratory setting. The subjects were again given the apparel to wear and asked to perform tasks in a field setting and to rate the prototype apparel function and

performance on a 5-point semantic differential scale on the parameters outlined for evaluation. All copies of the FADAC instruments were given back to the researcher after the two rating sessions. This represents a hundred percent return. The responses from the cosmetologists were collated and the average score was used for the analysis.

Data presentation and analysis

Research question

What are the mean ratings of cosmetologists on mobility, comfort, and safety/protection of the prototype functional apparel?

The data for answering this research question are summarised in Tables 1, 2, and 3.

Table 1: Mean ratings of cosmetologists on mobility variables

S/n	Mobility variables	\bar{X}	SD	Remark
1	Free movement of arms/Restricted movement of arms	3.67	.761	Positive
2	Free movement of torso/Restricted movement of torso	3.92	.654	Positive
3	Free movement of legs/Restricted movement of legs	3.83	.702	Positive
4	Ease of movement/confining	4.00	.590	Positive

Note: Variables were rated on a 5-point semantic differential scale where 5 was very positive and 1 was very negative

Table 1 shows the mean ratings of cosmetologists (small, medium, and large) on mobility variables regarding the functional apparel. There were four of these variables measured by having participants rate them on bipolar adjective sets on a 5-point semantic differential scale (5 = Very positive, 1 = Very negative). The adjective sets included “free movement of arms/restricted movement of arms”, “free movement of torso/restricted movement of torso”, free movement of legs/restricted movement of legs”, and “ease of movement/confining”. Scores were tallied for each adjective set. Table 1 clearly illustrates these data by mean and standard deviation values. All of the four adjective sets received positive mean ratings from these scores, showing that cosmetologists experience appropriate ease of movement on all the body parts when they move with the prototype apparel. This further indicates that participants have acceptable mobility when wearing the functional apparel.

Table 2: Mean ratings of cosmetologists on comfort of functional apparel

S/n	Comfort variables	\bar{X}	SD	Remarks
1	Comfortable/uncomfortable	4.17	.702	Positive
2	Flexible/rigid	3.75	.847	Positive
3	Cool/hot	4.08	.776	Positive
4	Soft to the skin/harsh to the skin	4.25	.737	Positive
5	Breathable/not breathable	4.25	.608	Positive
6	Feels soft/feels stiff	4.17	.565	Positive
7	Non irritating/irritating	3.92	.504	Positive
8	Loose/tight	3.75	.737	Positive

Note: Variables were rated on a 5-point semantic differential scale where 5 was very positive and 1 very negative

Table 2 shows the mean ratings of cosmetologists on comfort of functional apparel. The table indicates that comfort was measured by having participants rate eight bipolar adjective sets on a 5-point semantic differential scale (5 = Very positive, 1 = Very negative). The adjective sets are “comfortable/uncomfortable”, “flexible/rigid”, “soft to the skin/harsh to the skin”, “breathable/not breathable”, “feels soft/feels stiff”, “non-irritating/irritating”, “cool/hot”, and “loose/tight”. The functional apparel received more positive ratings on five out of the eight adjective sets. There is a concern that the cosmetologists may not have been able to perceive whether the functional apparel was “flexible/rigid”, “non-irritating/irritating”, and “loose/tight”. However, the mean scores on all items in the comfort scale were quite satisfactory which shows that cosmetologists were satisfied with the comfort of the functional apparel.

Table 3: Mean ratings of cosmetologists on safety/protection of functional apparel

S/n	Safety/Protection	\bar{X}	SD	Remarks
1	Easy to move in/Hard to move in	4.00	.590	Positive
2	Portable/Not portable	3.75	.737	Positive
3	Safe/Unsafe	3.67	.637	Positive
4	Provides protection/Lack of protection	4.25	.608	Positive
5	Lightweight/Heavyweight	4.17	.702	Positive
6	Not sturdy/Sturdy	3.67	.761	Positive
7	Functional/Not functional	4.25	.737	Positive

Note: Safety variables were rated on a 5-point semantic differential scale where 5 was very positive and 1 very negative

Data in Table 3 reveals that seven adjective sets were used to measure safety/protection variable of the functional apparel on a 5-point semantic differential scale where 1 was

associated with a very negative attribute assessment and 5 was associated with a very positive attribute assessment. The bipolar adjective sets included “easy to move in/hard to move in”, “portable/not portable”, “safe/unsafe”, “provides protection/lack of protection”, “lightweight/heavyweight”, “sturdy/not sturdy”, and “functional/non-functional”. Negative scores were tallied from ratings of 1.0 to 2.5, while positive scores were tallied from ratings 3.5 to 5.0. A rating between 3.0 and 3.5 was considered neutral. Table 3 further displays the mean and standard deviations for each adjective set. All of the adjective sets were positively rated showing that the design was successful. However two adjective sets were rated most positively, namely, “provides protection/lack protection” and “functional/non-functional”, with a mean score of 4.25 each. Each of these ratings shows that the functional apparel design was perceived to be safe and protective, optimal and well-constructed.

Hypothesis

There is no significant difference in the mean ratings of small-, medium-, and large-size-based users on mobility, comfort, and safety/protection requirements of the functional apparel. Data verifying this hypothesis are presented in Tables 4, 5, and 6.

Table 4: Result of one-way ANOVA of cosmetologists’ ratings on mobility requirements of functional apparel

S/n	Source of Variation		Sum of Squares (SS)	df	Mean Squares (MS)	f.cal	Sig. .05	Decision
1.	Free movement of arms/ Restricted movement of arms	Between Groups	2.333	2	1.167	2.227	.133	Accept
		Within Groups	11.000	21	.524			
		Total	13.333	23				
2.	Free movement of torso/ Restricted movement of torso	Between Groups	2.333	2	1.167	3.267	.058	Accept
		Within Groups	7.500	21	.357			
		Total	9.833	23				
3.	Free movement of legs/ Restricted movement of legs	Between Groups	2.333	2	1.167	2.722	.089	Accept
		Within Groups	9.000	21	.429			
		Total	11.333	23				
4.	Ease of movement/ confining	Between Groups	1.000	2	.500	1.500	.246	Accept
		Within Groups	7.000	21	.333			
		Total	8.000	23				

Table 4 shows that the p-value for all the variables used in the assessment of mobility in functional apparel are $>.05$. The implication here is that the hypothesis which states that there is no significant difference in the mean ratings of small-, medium-, and large-size-based users on mobility requirements of functional apparel was accepted.

Table 5: Result of one-way ANOVA of cosmetologists' rating on comfort of the functional apparel

S/n	Source of variation		Sum of Squares (SS)	DF	Mean Square (MS)	F-cal	Sig. .05	Decision
1.	Comfortable/ uncomfortable	Between Groups	1.333	2	.667	1.400	.269	Accept
		Within Groups	10.000	21	.476			
		Total	11.333	23				
2.	Flexible/rigid	Between Groups	4.000	2	2.000	3.360	.054	Accept
		Within Groups	12.500	21	.595			
		Total	16.500	23				
3.	Cool/hot	Between Groups	4.333	2	2.167	4.789	.019	Reject
		Within Groups	9.500	21	.452			
		Total	13.833	23				
4.	Soft to the skin/ harsh to the skin	Between Groups	1.000	2	.500	.913	.417	Accept
		Within Groups	11.500	21	.548			
		Total	12.500	23				
5.	Breathable/not breathable	Between Groups	1.000	2	.500	1.400	.269	Accept
		Within Groups	7.500	21	.357			
		Total	8.500	23				
6.	Feels soft/feels stiff	Between Groups	4.333	2	2.167	15.167	.000	Reject
		Within Groups	3.000	21	.143			
		Total	7.333	23				
7.	Non-irritating/ irritating	Between Groups	2.333	2	.1.167	7.000	.005	Reject
		Within Groups	3.500	21	.167			
		Total	5.833	23				
8.	Loose/tight	Between Groups	.250	2	.125	.214	.809	Accept
		Within Groups	12.250	21	.583			
		Total	12.500	23				

The hypothesis sought to compare the mean ratings of small-, medium-, and large-size-based users on the comfort of functional apparel. The rating was done on a 5-point semantic differential scale from very positive (5) to very negative (1). The scores were tallied and ANOVA was run to test the significant differences in the mean ratings of the 3 groups of respondents. Out of eight items on the scale, there was no significant difference ($P = >.05$) in five of the variables while there were significant differences ($P = <.05$) in the remaining three of the variables.

Table 6: Result of one-way ANOVA of cosmetologists' rating on safety/protection variables of functional apparel

S/n	Source of variation		Sum of Squares (SS)	DF	Mean Square (MS)	F-cal	Sig. .05	Decision
1.	Easy to move in/ Hard to move in	Between Groups	3.000	2	1.500	6.300	.007	Reject
		Within Groups	5.000	21	.238			
		Total	8.000	23				
2.	Portable/Not portable	Between Groups	.000	2	.000	.000	1.000	Accept
		Within Groups	12.500	21	.595			
		Total	12.500	23				
3.	Safe/Unsafe	Between Groups	1.333	2	.667	1.750	.198	Accept
		Within Groups	8.000	21	.381			
		Total	9.333	23				
4.	Provides protection/Lack of protection	Between Groups	.000	2	.000	.000	1.000	Accept
		Within Groups	8.500	21	.405			
		Total	8.500	23				
5.	Lightweight/ Heavyweight	Between Groups	5.333	2	2.667	9.333	.001	Reject
		Within Groups	6.000	21	.286			
		Total	11.333	23				
6.	Not sturdy/ Sturdy	Between Groups	2.333	2	1.167	2.227	.133	Accept
		Within Groups	11.000	21	.524			
		Total	13.333	23				
7.	Functional/Not functional	Between Groups	1.000	2	.500	.913	.417	Accept
		Within Groups	11.500	21	.548			
		Total	12.500	23				

Table 6 shows that the P-value for five out of the seven variables used in the assessment of safety/protection in functional apparel are $>.05$ while two are $<.05$. The null hypothesis was therefore accepted in five of the variables and rejected in two.

Findings

Mean ratings of cosmetologists on movement analysis revealed that both basic body movements and task-related movements were “easy to do”, with mean values > 4.00 except in “torso twists” and “ladder climbing”, which scored above the neutrality ratings with 3.92 and 3.75 mean values respectively. This indicates that the functional apparel did not impede the movements of cosmetologists during movement assessment. In addition to rating movements, general mobility was also rated while wearing the functional apparel. The mean values ranged from 3.67-4.00 on all four variables in the scale. This shows that cosmetologists experienced appropriate ease of movement and acceptable mobility when they wore the prototype functional apparel. The mobility variables were however perceived by judges higher than the cosmetologists. The grand mean values for the four groups of judges showed mean ratings ranging from 4.18-4.86. This indicates that judges rated the functional apparel higher in its ability to positively satisfy the mobility requirements of cosmetologists in their operation.

Functional apparel received more positive mean ratings on five out of the eight items on the comfort scale. The mean scores here ranged from 4.08 - 4.25. The other three items on the scale had values ranging from 3.75 - 3.92. There is a concern that the subjects may not have been able to appropriately perceive whether the apparel was “loose/tight”, “flexible/rigid”, or “non-irritating/irritating”. However, mean scores on all items on the comfort scale were quite satisfactory, indicating that cosmetologists were quite satisfied with the comfort of the apparel. The collective mean ratings for the judges show that they had mean scores ranging from 4.05 - 4.73 on seven out of the eight variables on the comfort ratings scale. The variable “loose/tight” scored the least mean value of 3.32, indicating that judges were neutral in their perception of the apparel being loose or tight on the models.

The mean scores on all the items on the safety/protection rating scale were positively high. Out of the seven items on the semantic differential safety scale, four items received ratings ranging from 4.00-4.25. These items include “functional/non-functional”, “provides protection/lack of protection”, “light weight/heavy weight”, and “easy to move in/hard to move in”. The other three items show positive ratings between 3.67-3.75. The result shows that the functional apparel was perceived to be safe, protective, that it functioned well and was constructed well (see Table 14). Mean ratings of judges on safety/protection variables were higher than the cosmetologists on all the seven items on the safety scale. Values ranged from 4.23-4.73.

Discussion

The present study’s purpose was targeted at the assessment of functional apparel product developed for cosmetologists by the users of the product. The study’s discussion is based on the criteria of mobility, comfort and safety/protection. However, prior to the discussion of these variables, analysis of the movement assessment result is deemed necessary to support the mobility variable.

The mean scores of respondents on the movement assessment revealed that subjects rated both basic and task-related movements above 4.00, except in “torso twists” and “ladder climbing” which had satisfactory scores of 3.92 and 3.75 respectively. It could be inferred that the functional apparel did not impede the movements of cosmetologists during the movement assessment as was expected, as each of the movements outlined in the movement protocol is pertinent to cosmetology operation. Cosmetology practitioners are required to perform many of them on a regular basis. This finding negates the findings of a similar study carried out by Barker (2007) where police officers indicated that their ballistic vests inhibited their movement during a number of activities. This could be disconcerting as law enforcement agents are not supposed to experience limited movement while performing daily job-related tasks. The functional apparel designed for cosmetologists was successful in this regard and its implementation will not interfere with the performance of any task in the operational framework of the cosmetology occupation.

The findings of the study in Tables 1 and 4 revealed that all of the four adjective sets on the mobility scale received positive mean ratings. This finding lends support to the findings of the movement analysis to confirm that cosmetologists experienced appropriate ease of movement on all the body parts and during task-related movements when they wore the prototype

apparel. This is indicative of acceptable mobility and high levels of satisfaction. However, as Holland (2007) observes, there is need for increased research on measures of mobility to enhance performance and integrity of functional apparel products. Higher mean values recorded for the judges indicate that the judges perceived a higher integrity of the functional apparel sets in its ability to positively satisfy the mobility requirement needed by cosmetologists to function in their field. There were no significant differences found on all four variables in the mobility scale ($p > .05$).

Mean ratings of eight comfort descriptors on the comfort scale revealed that the functional apparel received more positive ratings from the three categories of cosmetologists in five out of the eight adjective sets (see Tables 2 and 5). The perception of the cosmetologists on the comfort descriptors of “flexible/rigid”, “non-irritating/irritating”, and “loose/tight” was a little lower than the rest even though all ratings revealed satisfactory scores in small-, medium-, and large-size categories. This judgement was also supported by the expert judges. Significant differences were found in certain variables, while in others, there were no significant differences. The judgements of comfort on all size categories of cosmetologists as satisfactory were surprising. Barker (2007) in her study asserts that it is generally expected that as a person’s size increases in weight and/or height their comfort level will decrease due to increased fitting problems. This phenomenon was not evident in this assessment because the assessment was done under favourable environmental conditions which may not have allowed the cosmetologists to perceive any discomfort. This contradicts the findings of Branson and Sweeney (1991) and McCullough et al. (2003) which posit that clothing comfort results from the interactions of various physical and non-physical stimuli for a person wearing a given ensemble under given environmental conditions. It is suggested that a follow-up testing be done in hot-humid environments and with an extended testing period to properly determine any differences in comfort levels of study participants.

The protection/safety variables were positively rated with scores ranging from 3.67-4.25 for the three sets of cosmetologists and 4.23-4.73 for judges. Out of seven variables tested, there were significant differences found in two variables with $P < .05$ and no significant differences found in five of the variables ($P > .05$). This shows that the design was successful. However, two items on the scale were rated most positively - “provides protection/lack protection” and “functional/not functional (see Tables 3 & 6). Each of these ratings confirms that the functional apparel design was perceived to be protective, that it functions well, and is constructed well. This finding agrees with Fowler’s (2003) findings with police officers’ ballistic clothing which was perceived to be functionally protective. Since the variable “safe/unsafe” received the lowest positive score of 3.67 indicating that the mean is not on the negative side of the scale, it could be deduced that the design, though not unsuccessful, could benefit from improvements in the safety aspect, perhaps with the introduction of detachable suspended pockets for tools around the waist line.

Conclusion

Cosmetologists require functional apparel to address the complexities of needs in their occupation. Mean ratings of cosmetologists indicated that the criteria established for a meaningful and promising product for this population was actualized and therefore product accepted. However, since some of the variables received a little above neutrality rating,

there is room for improvement in the styling and fabrication of the functional apparel product with the omission of the shirt collar and subsequent modification of the shirt neck to account for greater comfort. Ethnic fabrics could also be used in the design of the functional apparel product to capture the geographical location where this study was carried out.

The implementation of the results of the findings will boost the Research and Development exhibitions currently introduced by the National Universities Commission (NUC). This will generate creative and problem-solving approaches to addressing design problems among the universities so as to gain competitive advantage in the functional apparel market both locally and globally, and to make available the findings of the study to apparel manufacturing industries in Nigeria to encourage the production of functional apparel products in other occupations.

There is urgent need to enhance apparel design knowledge and skills of students in tertiary institutions so as to (a) enable them to cope, on graduation, with the development of functional apparel problems for people in diverse situations; (b) enable clothing and textiles graduates to gain competitive advantage in the functional apparel market both locally and globally; and (c) enable graduates of clothing and textiles to exercise creativity in the research and development of apparel projects to meet user needs in many occupational sub-sectors.

Biography

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The International Federation for Home Economics is the only worldwide organisation concerned with Home Economics and Consumer Studies. It was founded in 1908 to serve as a platform for international exchange within the field of Home Economics. IFHE is an International Non Governmental Organisation (INGO), having consultative status with the United Nations (ECOSOC, FAO, UNESCO, UNICEF) and with the Council of Europe.

This refereed journal brings together emergent and breaking work on all aspects of Home Economics, and most importantly, how we might improve and renew the everyday work of Home Economists. It features quantitative and qualitative, disciplinary and trans-disciplinary, empirical and theoretical work and will include special editions on key developments. It aims to push the boundaries of theory and research—to seek out new paradigms, models and ways of framing Home Economics.

Contributors

The International Journal of Home Economics welcomes contributions from members and non-members, from a variety of disciplinary and theoretical perspectives.

Author's biography

Please provide a brief (less than 100 words) paragraph for each author, including current role or memberships and an E-mail address for correspondence. For example:

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Donna Pendergast

Publication in IJHE provides wide exposure to journal articles and adds to the professional literature base of the field. Theoretical papers, literature reviews, and a wide range of genres along with research papers are invited for publication in the journal. As editor, I strongly encourage submissions to the journal. The papers included in this issue of the journal represent a diverse range of genres but share a common thread—a strong link to enhancing wellbeing.

This issue of the IJHE includes a selection of the best refereed papers presented at the IFHE XXII World Congress focusing on Global Wellbeing which was held in Melbourne, Australia from 16-21 July 2012.

As always, the articles have undergone rigorous, double-blind review, and are adding to the professional literature base of the field.

Professor Donna Pendergast, PhD
Editor, IJHE

Call for Papers

Special Issue of the International Journal of Home Economics

20th Anniversary of the International Year of the Family (IYF)

2014 marks the **20th Anniversary of the International Year of the Family (IYF)** offering an opportunity to refocus on the role of families in development; take stock of recent trends in family policy development; share good practices in family policy making; review challenges faced by families worldwide and recommend solutions. The International Federation for Home Economics (IFHE) will support the anniversary with a campaign focusing on "**Empowering Families, Individuals and Communities through Home Economics**".

The *International Journal of Home Economics* (IJHE) will publish a special issue with a focus on family to align with this significant anniversary. The Journal will be published in **December 2014**. The intent of the special issue is to provide a platform for the examination of various aspects of family research and thus to foster progress in its theoretical development.

Conceptual and empirical research with a theoretical basis that advances knowledge are being sought. Studies using quantitative and/or qualitative approaches are welcomed. Also of interest are philosophical and contextual papers providing challenges and insights with regard to family studies.

Members and non-members of IFHE are encouraged to submit articles for review. Manuscripts should follow the usual journal guidelines and be submitted in full by the closing date. An email with an abstract proposal is required by **November 1 2013** to flag an interest in publishing in this exciting issue.

Interest in submitting a paper:

To: d.pendergast@griffith.edu.au
Closing date: **1 November 2013**

Full paper submission details:

To: d.pendergast@griffith.edu.au
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Call for Proposals

Guest editorial and special themed issue 2015

Members of the International Federation for Home Economics are invited to submit a proposal to serve as Guest Editor of the *International Journal of Home Economics* (IJHE) for a special themed issue related to their area of expertise of relevance to home economics in 2015.

An example of a forthcoming special issue in 2014 is the special issue themed on the **20th Anniversary of the International Year of the Family (IYF)**.

Applicants are invited to provide the following proposal information by **1 January 2014**:

- Description of the proposed theme and a justification of its relevance to the home economics field of study - 3-500 words
- Curriculum vitae of guest editor

Proposals to

To: d.pendergast@griffith.edu.au

Closing date: **1 January 2014**

A Family Ecology and Consumer Science profession for the 21st Century

Judith J Cornelissen

University of the Western Cape, AS van Wyk

Introduction

For the Family Ecology and Consumer Science profession in South Africa to survive and thrive in the 21st century, it would need to develop and agree upon paradigm, a single definition, and an overarching theory that would inform a conceptual model for the profession that is applicable to the specific challenges of the country. Professionals in the field should not be wasting time on debating this issue, but rather analyse these concepts so that theory development within a unified profession can be evidenced in praxis. It is a matter of urgency that the profession moves away from the scientific paradigm and knowledge base, which dominated the profession during the last 100 years. A paradigm practicing the relevance of scientific knowledge in relation to the context of today's modern and complex family life without questioning cannot be seen as viable.

Numerous discussion and position papers have been developed and prepared to discuss the definition, theories, models and knowledge context of the profession. However, the mission statement formulated by Brown and Paolucci for the profession in 1979 is still accepted as a guiding parameter for the practice of the profession in the 21st century.

To fulfil the mission of the profession the question to be answered is: What should be the paradigm, knowledge organisation, theories, model and view of a profession that professes to be the voice of the family in South Africa?

Definition, mission and focus of Family Ecology and Consumer Sciences

The definition of Family Ecology and Consumer Sciences, namely "*an integrative approach concerned with enhancing the quality of life by focusing on the interrelationships among individuals, families and communities and the multifaceted environments in which they function*" (Stage & Vincenti, 1997pp. 306) will support the mission statement of the profession "*to enable families, both as individual units and generally as a social institution, to build and maintain systems of actions which lead (1) to maturing in individual self-formation and (2) to enlightened, cooperative participation in the critique and formulation of social goals and means for accomplishing them*" (Brown & Paolucci, 1979, p. 23).

It is proposed that the above definition and mission should underpin and be used as a theoretical framework to establish a new direction for Family Ecology and Consumer Science in South Africa.

The concept **to enable** has a process component. The profession should help members to develop enabling skills to realise this part of the mission statement. These enabling skills and

qualities include genuine care and concern for others, respect for one's body and health, intelligence, and an ability to learn and translate theory into practice. The Family Ecology and Consumer Science professional should possess social intelligence and common sense, the knowledge that helping is hard work, and respect for people with whom they are engaging. There should be a recognition of the need for action; not for self-gain, but to enhance the enabling process. The professionals in training need to assure that all acquire these enabling skills, as they are essential for helping individuals and families seeking to function in their own strength.

The focus of profession should also serve the needs of *families, both as individual units and generally as a social institution*. The phrase social institution means to establish, stabilise and secure organisation in the social, everyday life of people. Family Ecology and Consumer Science should regain its family perspective and focus. The objective of the profession should, by its very nature have a commitment to study and practise the family perspective of everyday life. Each family unit is unique and at the same time, families are an institution of every society. Membership in a family is both involuntary and voluntary, with many people becoming members of more than one family network over their lifetime. Families may organise themselves in different ways and play unique roles within a particular culture, but families are and will always remain an essential fabric of society. In studying the family it becomes clear that there is a web of interrelationships in the family, which are inter-subjective. A family is interwoven with local, national and world events. Families are complex, living and open systems; they are also dynamic and in process reciprocal with others systems, having boundaries that signify to family members their scope and limits.

Family Ecology and Consumer Science, with the family as its core business, should offer services to individuals and families to benefit society in socially responsibly ways. The profession must seek to guide morality and responsible citizenship. The profession should advocate and play a political role to enlighten and empower families through activities of advocacy.

The mission statement of the profession is to *build and maintain systems of actions*. Action is a mental process, which is based on the examination of principles appropriate to a particular situation and its response to external and internal stimuli, through reasoning rather than habit or reaction (Vaines, 1980, p.111). The ideal interpretation for the profession should be to seek a blending of the three systems of action, namely analytical empirical, interpretative and critical science perspectives with respect to theory and practice. Kieran, Vaines & Badir (1982, p. 59) suggest that in blending these systems of action it would strengthen research, clarify concepts and identify human concerns arising from practical work in areas that needed critical analysis and discussion in the profession. The relationship between these factors and practices are important for systematic theory development, and additional research in all the content areas is necessary to expand the profession. This will consolidate the theory/practice link and the theory/research link. However, the profession should embrace the emancipatory action/critical science perspective as the primary system of the three systems of action. At the centre of this action is empowerment and critical emancipatory action. The theory that would support these systems of action is the theory of empowerment.

Empowerment

Empowerment is a construct shared by many disciplines and arenas: community development, psychology, education, economics, and studies of social movements and organisations, among others. Empowerment is a process that challenges the assumptions about the way things are and can be. It challenges the basic assumptions about power, helping, achieving, and succeeding. At the core of empowerment is the idea of power. The possibility of empowerment depends on two things. Empowerment requires that power can change. If power cannot change, it is inherent in positions or people, which means that empowerment is not possible, nor is empowerment conceivable in any meaningful way. In other words, if power can change, then empowerment is possible. Empowerment depends upon the idea that power can expand (Page & Czuba, 1999, p. 4).

Page and Czuba (1999, p. 3) define empowerment as a multidimensional, social process. It is multidimensional because it occurs within sociological, psychological, economic and other dimensions. Empowerment also occurs at various levels, that of the individual, group and community. Vaines (1993, p. 23) stated that Family and Consumer Science scholars have explored the concept of empowerment to a limited degree. Vaines (1993, p. 23) continues that in empowerment, power is shared and leadership is inclusive. The language of empowerment reflects these beliefs.

Using an emancipatory approach to practice, leads to the ability to affect or shape household and institutional change to benefit society at large. Critical emancipatory action encourages self-reflection and self-direction to determine what Family Ecology and Consumer Scientists are and should be doing so that families and communities may enhance their quality of life. Emancipatory practice frees the individual and family to examine other and new ideas. This entails an evaluation process, which allows people to judge the adequacy of their environments against their own needs and goals, and vice versa. From this type of practice, professionals are no longer seen as the experts, giving advice; instead the Family Ecology and Consumer Scientist facilitates dialogue and reflection leading to morally justifiable, ethical, sustainable household management decisions.

Professionals must consciously make a paradigm shift that would require the development of skills to analyse each situation for determining which combinations of actions are appropriate. It is crucial to ethically deliver services to families, using emancipatory actions, to empower them to help themselves. Through the ability to think critically or deliver services from several perspectives, we can create a supportive environment where families can solve practical problems using ever-changing combinations of analytical-empirical, interpretative and critical/emancipatory actions.

The family is an example of an ecosystem: a group of organisms interacting with each other and with their environment. By means of the ecological systems approach, human society is treated like a biological organism/system and can be studied as such. This is a valid approach to be applied in the profession for emphasising the interaction between families and the conditions that surround them.

The different parts of a system that is a biological organism correspond to the different institutions that make up a society. Just as the parts that make up a biological organism (such as the eye and the hand) are interrelated and interdependent in their interaction with one another, so the institutions in a society (such as the economy and the government) are closely related to one another.

A change in a single component of the family ecological system impacts on the other parts (Goldsmith, 1996, p. 34). Human beings, their environment and the interactions between them are the three central organising concepts that compose the human ecological system (Deacon & Firebaugh, 1988, p. 28). Emphasis is placed on the interaction of human beings with their near environment. The human environment is interpreted as physical and biological, as well as cultural and social. The holistic study of human beings, their environments and the interactions between them is grounded in a problem based integrated study. Interdependent "integrative" models by definition, would attempt to emphasise and conceptualise the interdependent nature of Family Ecology and Consumer Science related specialties, and to provide a larger context for future growth and refinement, a variety of skills and conceptual orientations within the profession.

The preceding discussion builds up a position for Family Ecology in South Africa however; the profession also has a Consumer Science part to it. The name Family Ecology and Consumer Science is reflective of the differences in the focus within the South African context. Due to the previous dispensation where society was polarised by race, the White South African population mirrors a first world picture of consumerism while the Black population is still grappling with development concerns.

In Consumer Sciences the family is still the focus of enquiry especially as to how it is affected by globalisation. Family Ecology and Consumer Scientists should bring a global perspective into the curricula, policy and practice. Modern consumption is now a global phenomenon. Consumption is almost universally seen as something positive and informs the primary goal of most national economic policy

Consumerism 'underlines the interconnectedness of national economies, and so affects the rich and the poor, shapes international trade, politics and peace' (Gabriel & Lang, 1995, p. 5). As a result of global links, it is inevitable in a capitalist society that interdependencies will evolve between societies. To address this situation, Family Ecology and Consumer Scientists need to assume a more visible role in civil society, defined as citizen activity outside state and business control and independent of them; activity that is directed towards building just and democratic societies bringing together the Hestian/Hermean paradigm.

This is where Family Ecology and Consumer Scientists come into play. We need to act on our growing appreciation of the linkages between consumer socialisation, acculturation and globalisation. A global perspective consists 'of the information, attitudes, awareness, and skills, which taken together, can help individuals understand the world, how they affect others, and how others affect them' (Babich as cited in Smith, 1993, p. 19). There are close similarities in the definitions of socialisation and a global perspective, in that both are concerned with information, attitudes, awareness and skills needed to fulfil the consuming

role. Consumption decisions taken from a global perspective would entail (a) challenging materialism and commercialism, (b) examining one's role as a citizen engaging in a lifelong consumer socialisation process, and (c) gaining a deeper understanding of how current decisions have a profound impact on those in other countries, those not yet born and on the environment.

A global perspective helps educators understand the family or household as an ecological system, an environment where decisions are taken that can lead to a better quality of life for all. This point of view is possible because families are seen as dynamic ecological systems that can adapt and change themselves rather than remain static, grounded in how they were initially socialised to be consumers. They can be socialised to care for each other and the earth, to appreciate that living in harmony with environments, demands ethical judgements about how to live differently, and to see the merits of embracing stewardship rather than exploitation. With help, consumers can critically question consumption, production, distribution and institutional practices that shape the world and take action to better this world (McGregor, 1999, p. 39).

Consumption from a global perspective means people become concerned with the impact of consumption and production on the environment. It means they gain an appreciation of the notions of voluntary simplicity and conservation, and a deeper respect for indigenous knowledge and how it is passed on to future generations. People will start to think about the consequences of their consumption decisions. This reflection involves developing a growing awareness of global dynamics, the state of the planet, and the existence and nuances of other cultures and the reciprocal interrelationships between these cultures. Living a sustainable lifestyle is not possible without adopting a global perspective because it inherently assumes an appreciation for the impact of technology and development on the integrity of local indigenous communities, infrastructures and natural environments (McGregor, 1999, p. 39).

Consumer globalisation assumes that people can learn new ways to approach modern consumption if they adopt a lifelong learning process whereby existing knowledge in memory is modified by the introduction of new knowledge. Appreciating the necessity and process of consuming from a global perspective is indeed new knowledge for many people and includes the changing meaning of what it means to consume.

Family Ecology and Consumer Scientists should consider the idea that actions and experiences as consumers and economic agents cannot be detached from actions and experiences as social, political and moral agents. The future of global consumption must remain the object of questioning on economic, cultural, environmental and moral grounds' (Gabriel & Lang, 1995, p. 4). The authors contend that, while the end of Western consumerism is not yet in sight, its future can no longer be taken for granted. This inevitable shift in the momentum and direction of modern consumption presents the opportunity to impact its new direction and focus. Contemporary consumerism is the product of long-term historical changes and, by implication, can be further changed. As professionals and citizens acting in civil society, professionals need to contribute to the remaking of modern consumption in the global market. This contribution includes socialising consumers to the necessity of dismantling the

existing consumer economy, gradually opening opportunities to replace it with a low-consumption economy that can be sustained and that can endure. Maintaining the status quo is not politically possible, morally defensible or ecologically sufficient. Rampant commercialism and consumerism downgrade family and community values. Professionals have to be concerned with both sustainable *and* ethical consumption. Every global citizen has to change his or her values and principles. Implication, business and government's trade will challenge production and foreign policies challenged, as well leading to an even more profound change in consumption patterns around the world (McGregor, 1999, p. 43).

A paradigm that the profession should adopt to view the new modern family's context, is the Hestian/Hermean paradigm which will achieve the final part of the mission namely *enlightened, cooperative participation in the critique and formulation of social goals and means for accomplishing them*. The profession should make a bold move to professionally socialise Family Ecology and Consumer Science students, to enable them to integrate the Hestian/and Hermean systems of human action.

Thompson (1992, p. 49), who developed this paradigm, described the *Hestian domain* as the domestic, private, caring domain where all the interrelated activities demanded by nurturance are integrated at a personal level. The *Hermean domain* can be viewed as a civic and controlling domain where all the interrelated activities demanded by governance are integrated at an impersonal level.

As Family Ecology and Consumer Scientists are concerned with the quality of life of individuals, families and communities, the Hestian domain is the domain of domestic economy, its goal being to maintain stability and provide nurturance and survival to a human group. The basic social unit occupying the Hestian domain is the family (Thompson, 1992, p. 36). Household work (not housework) involves numerous Hestian activities in which people engage in for their own well-being or for the well-being of their families and communities.

The Hestian/Hermean paradigm will allow Family Ecology and Consumer Science professionals to shift perspective in their mental world without a comparable shift in the gender world. This shift in perspective will bring both the "female world" and the "male world" into sharper focus. Neither domain is limited to a single sex, nor are both sexes caught in the tensions that exist between them. As females and males live both in the private Hestian domain and the public Hermean domain, they must learn to use their intelligence to function effectively in both domains (Thompson, 1992, 34-35).

The Hermean domain is the domain of governance and political economy. The goal of the Hermean system is to maintain public life and public order, which is, to manage broad-based social change. Hermean systems of action serve to maintain patriarchal control and power in the public world. The Hermean system is maintained through subsystems exercising bureaucratic control over the resources essential to maintain Hestian needs. The Hermean system simultaneously throughputs its own inputs, which it outputs to the Hestian system as inputs, and vice versa. Feedback loops link the two systems. Matters affecting the quality of life of individuals and families involve feedback loops from the Hestian to the Hermean and back to the Hestian domain. When outputs from the Hermean system (laws, policies, or

regulations) are inputs to the Hestian system, there will be effects on women, men, children, and families alike (Thompson, 1992, pp. 103, 107).

McGregor (1996, p. 23) suggests that the Hermean/Hestian paradigm can be achieved on three different levels and explained using a three-tiered political participation hierarchy. A Family Ecology and Consumer Scientist could be a spectator who is a passive yet receptive onlooker to policy activity impacting on families. They can also fulfil an advocacy role for family well-being interacting between families, the profession and political arena. They can assume a direct activist role in the political arena on behalf of individuals and families. The researcher proposes that Family Ecology and Consumer Scientists should assume the role of political activists for family issues.

To address this potential reality, Family Ecology and Consumer Scientists may shape and influence policy by integrating the Hestian/and Hermean perspective in family policies. Integrating the family and household issues is at the centre of the policy. This means that when professionals are asked to respond to a request from, or when familial issues are taken to policy makers, they should be advocating for empowerment and emancipation in the policy rather than for control and power. Using an emancipatory approach to practice leads to the ability to affect or shape familial and institutional change to benefit society at large.

As a profession in higher education, Family Ecology and Consumer Science must adopt a global perspective within a Hestian/Hermean paradigm, underpinned by the ecological systems approach and empowerment theory and using the emancipatory critical science system of action.

Biography

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Kenyan student teachers' perceptions of health and how these perceptions change during teacher training

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Abstract

This paper examines the perceptions of the concept of health of Kenyan student teachers studying Home Science and Health Education in five teacher training colleges (TTC) in Central and Eastern Province of Kenya, and the changes in these perceptions during teacher training. Theoretically the study draws on everyday life learning and situated learning. The study uses mixed methods including focused group discussions and health composition writing. A catalogue with 18 components of health was defined on the basis of data from 8 focused group discussions with student teachers. First year (n = 576) and second year (n = 355) students then wrote health compositions which were analysed according to the categories in the health concept catalogue. The study documents how students at entry point of TTC hold faceted concepts of health drawing on biomedical, bodily, cultural, social and material components. However, by the end of teacher training, biomedical components play a smaller role and cultural and social components a larger role in students' conceptualization of health, despite contextual circumstances such as for instance Science teaching.

Keywords: Health concept, health education, student teachers, everyday life, Kenya.

Introduction

This paper aims at exploring Home Science student teachers' changing concepts of health during their Health Education studies at Kenyan teacher training colleges (TTC). In many low-income countries, the school teacher plays a crucial role as one of the few educated individuals with a formal education in health and home science. The majority of children do not receive education beyond the primary level, and teachers in many cases are for these children the only source of formal education. Teachers' perceptions of health are therefore worth investigating. The word "health", however, is not a precise concept and defining it in local terms is often a problem (Onyango-Ouma, Aagaard-Hansen, & Jensen, 2004, p. 326). Kenya consists of more than 340 ethnic groups, and they all have their own words and meanings for health. These meanings all illustrate the diversity of the World Health Organization's (WHO) conceptualization of health, where health is defined as "a complete state of physical, social and mental well-being and not merely absence of disease and infirmity" (WHO, 1946).

There are only a few studies that focus on health education as an academic and school subject and on teacher training in it, and very little research has been undertaken among student teachers in this field (e.g., Paakkari, Tynjälä, & Kannas, 2010). Furthermore, there

has been no research to my knowledge that has focused on health conceptualizations among student teachers in a developing context. This study aims to help to fill this gap by exploring how students develop health concepts during their two years of training at TTC. The intention is to connect the study of health concepts to the study of everyday life in cultures and societies where nearly “all is everyday life” (Gullestad, 1989, p. 18). In a cultural-constructivist view, everyday life is a “figured world” (Holland *et al.*, 1998, p. 49) made up of “webs of meaning” that “take shape within and grant shape to the coproduction of activities, discourses, performances, and artefacts” (Geertz, cited in Holland *et al.*, 1998, p. 51). In keeping with Holland *et al.*, students' world of health can illustrate how they view health in their everyday lives at college. Following Lave and Wenger's (1991) concept of situated learning, students during their two years at TTC become central participants who actively appropriate their health conceptualizations in relation to this field.

Two central questions guided this study: (a) How do Kenyan student teachers perceive the concept of health? and (b), How does this concept change during students' training in the context of the TTC? Underlying this inquiry is a concern whether Home Science and Health Education in Kenyan teacher education is a constructive force and a resource that empowers students to become health agents that can act for improving primary school children's health, or whether it mainly is a negative force and a barrier against students' future Health Education agency in schools.

The paper begins by introducing the concept of health and salient features of the Kenyan context, especially what is referred to as “the life world” (Hundeide, 2003; Schutz, 1973) in Kenyan TTCs, with the view to situating health conceptualizations in a contextual frame. Two central and closely related topics will be examined: health conceptualizations and determinants for health, and changes in these in the course of teacher training. The findings can cast a view on how TTC as a higher education institution is a context of political and educational meaning-making, and what this means for the liberating visions in the Kenyan health education and health promoting project.

A contextual approach to the study of health

Specification of the meaning of teachers' professional lives requires close attention to the dynamic contexts in which they are formed, sustained and transformed over time (Little & McLaughlin, 1993, p. 2). TTC is a context that constructs individuals, including their academic understanding of the concept of health. Although the concept of health has traditionally been a Western enterprise, studies of perceptions of health, illness and disease in different societies and contexts have a long history, in biomedicine, in social studies and in the humanities. While a number of studies have explored children's concepts of health, illness and disease (Meinert, 2004; Onyango-Ouma *et al.*, 2004), the study of teachers' health conceptualizations in education institutions is, to the author's knowledge, non-existing. By applying WHO's health definition, we can examine aspects of health other than the western biomedical one (Jensen, 1997). Jensen and Jensen (2002) have challenged the biomedical approach and argued for a comprehensive conceptualization, incorporating dimensions such as mental and social wellbeing and freedom from disease, as well as lifestyle and living conditions, as equally important for health.

The recent debate in cultural studies and medical anthropology has revolved around the many facets of health. There is some evidence in the literature that social and cultural perspectives play a large role in how people understand and make use of health, for instance in sub-Saharan settings. Meinert (2004, p. 11) suggests that health in a Ugandan context can be described as “having a good life”, which is experienced as a social achievement conditioned by access to a variety of human and material resources. Onyango-Ouma *et al.* (2004) suggest that Kenyan children possess a multidimensional concept of health where concepts of competence, for instance “being active” and “being able to carry out tasks”, play important roles in understanding what health is. These studies resemble new childhood studies (James & Prout, 1997) in their increasing emphasis on subjects' own views, and in their understandings that growing up is considered a social construction and that people are active determinants of their own social lives, the lives of those around them and the societies in which they live (James & Prout, 1997, p. 8). Individuals are not only passive respondents of social structures and processes, but active in how they engage in learning, as critical and social learning theory have taught us (Freire, 1973, Lave & Wenger, 1991). According to James and Prout (1997) and James, Jenks and Prout (1998), growing up takes place in the space between the individual and their context. The importance of the context is also acknowledged in WHO's health promotion approach: “Health is created where people learn, work, play and love” (WHO, 1986, p. 3). Thus, learning about health includes active appropriation of social context (Dybdahl & Hundeide, 1998). Students' health values and beliefs are, therefore, closely related to subjectively perceived important goals in their everyday lives at TTC.

The setting of health education in Kenyan teacher training

Kenyan society is heterogeneous and has a rich history. The population comprises of more than 340 ethnic minorities, each of which can be seen as clans that are extensions of the families (Dybdahl & Hundeide, 1998). With a maternal mortality rate at 550 per 100,000, an infant mortality rate at 55 and an under-5 mortality rate of 84 out of 1000 live births, and a life expectancy at 60 years, Kenya has one of the world's poorest health statistics (WHO, 2011). Despite poor health statistics and despite being a poor country, Kenya has one of the strongest educational infrastructures in sub-Saharan Africa. Kenyan teacher education is highly systematised and very organised, and the Health Education syllabus is relatively untouched by cultural and social taboos such as the HIV/AIDS pandemic, which has been addressed much more overtly in the Kenyan national syllabi than in comparable countries, for instance Uganda and Tanzania. This makes Health Education in Kenyan teacher education worthwhile investigating as a potentially developing field. At the time of writing, there were 18 public TTCs with a capacity of 600 students in each and more than 100 private TTCs.

At the international level, concerns have been raised about efforts in teacher education to focus on science rather than humanistic or social aspects (Cochran-Smith, 2004). This tendency is also evident in Kenyan teacher education. The privatization of teacher education has led to increased competition among students and a need for improving exam grades and passing exams, not least in the topic of Home Science and Health Education in Science, where biomedical topics dominate. The primary teacher Health Education syllabus includes exclusively biomedical knowledge such as hygiene, body functions, medicine and diseases (Ministry of Education, Science and Technology (2004) and generally ignores a holistic health knowledge that includes social, cultural and psychological dimensions as equally important for

health. Mostly the syllabus is delivered to students by lecture with little variety in teaching method, with the Science and Home Science teacher found in front of the classroom, which makes inclusive teaching difficult. Whether students' opportunities for participation in health knowledge are also limited, is a gap this paper aims at exploring.

Methodology

Research design and methods

Data were collected among 931 first- ($n = 576$) and second- ($n = 355$) year students in five TTCs in Central and Eastern Province of Kenya from September to November 2010. The sample consisted of 463 female and 448 male students. Twenty students did not report their gender, and one student declined to participate. The colleges were carefully selected to ensure variety in the material and social contexts. Geographical location and ethnic composition in students' backgrounds played an important role in the location of the five colleges. Familiarization with students was done during the 12 months prior to data collection. Two months prior to the health composition writing, eight focused group discussions (FGD) with 10-12 students were held to generate data about health beliefs and perceptions to construct a frame for analysis of the health compositions.

The students ($n = 931$) were then asked to write a composition in English (minimum half a page, maximum three pages) in which they were to answer the following two questions:

1. What is the meaning of the word health?
2. How can you determine if a person is healthy?

In spite of students' different ethnic backgrounds and mother tongues, the composition writing was conducted in English, assuming English literacy since teaching at TTCs is conducted in English. Trained field assistants assisted during the composition writing and translated from mother tongue to English where necessary. Prior to the composition writing, the students were informed about the nature of the research and the non-examinatory purpose of the research. This was done to reduce the number of answers of text-book definitions such as recitation of WHO's concept of health as social, mental and bodily health (WHO, 1946) which the students were taught during HE lessons. Informed consent was obtained.

Data analysis

Data from the FGDs were analysed using grounded theory (Glaser & Strauss, 1967) for content and a preliminary analytical catalogue was developed for analysis of the health compositions. Drawing on Bourdieu's (1986) notion of capital, the notion of health was expanded compared to WHO's (1946) definition to include broader conceptualizations. Eleven larger meta-categories covering biological, mental, social, cultural, aesthetical, religious, political and economical/material aspects of health were developed. These included 18 subcategories for different perceptions of health, which were the result of the analyses of the FGDs. Each subcategory included several lay definitions of health. For instance, the meta-category of

“social aspects” consisted of three subcategories: “good manners”, “family issues” and “good social relations”. The subcategory “good social relations”, for instance, consisted of six lay definitions: knowing more about yourself; relate to others in good ways; live and share life together; socialise by going out over weekends; establish good connections to others; and establish social network.

Each composition had an average length of 182 words: 192 words average for first-year students ($n = 576$) and 165 words for second-year students ($n = 355$). The data in the compositions were then read and analysed using the initial analytical instrument for health conceptualization. Virtually all data fit into the preliminary framework except for two subcategories, which were discovered during subsequent reading of the health compositions and included in the catalogue. First analysed compositions were then reread and reanalysed according to the revised analytical catalogue. Findings were summarised in a spreadsheet along common lay definitions of the subcategories. The spreadsheet allowed for quantification of responses, given in Tables 1 and 2. Individual statements are also drawn on to illustrate the different aspects of health for first- and second-year students. The qualitative data were analysed using grounded theory from a randomly selected sample of 100 students' compositions.

Results

Health conceptualizations and determinants for health

The students' concepts of health covered 18 different sub-categories, as outlined in Table 1. In the health compositions it was observed that students leaned on concrete and practical terms and terms that required individual or collective action. This indicates that students related their action competence (Jensen & Schnack, 1994) as important aspects of being healthy (cf. Onyango-Ouma *et al.*, 2004).

Most students embraced several dimensions as important determinants for health. For instance, one composition was organised around at least six sub-categories of health conceptualizations: lack of disease, strong body, basic needs fulfilled, stress-free, good social relations, and good appearances. This indicates that students thought holistically about health:

Your body is healthy if you are able to perform all the body functions well without complaining of any abnormality, for instance you are able to walk, run, go to work without taking any drugs. Health also involves the environment. If the people near you do not stress you in life, or you stay in a beautiful place then your mind is relaxed and you can carry on with life well without complains of depressions or fear. A person who is healthy is able to learn, work and be a resourceful person. He always takes life positively, interacts well with other people and is flexible to handle situations in life as they appear. (Female student, 32 years)

Table 1 Student Teachers' Health Conceptualizations

Health concepts	No. of students (1 st and 2 nd year) reporting concept	
	<i>n</i>	(%)
Textbook definition	299	(32)
Lack of disease	582	(63)
Lack of pain	32	(3)
Clean environment	410	(44)
Basic needs fulfilled	667	(72)
Strong body	728	(78)
Good mood	217	(23)
Stress-free	156	(17)
Mental adjustment	35	(4)
Good manners	26	(3)
Good social relations	154	(17)
Family issues	10	(1)
Becoming learned	80	(9)
Good appearances	156	(17)
Religious aspects	82	(9)
Self-decision/empowerment	143	(16)
Being wealthy	255	(27)
Other	5	(1)

n = 931. As the students could give more than one answer, the sums are greater than 931 (100%).

The results in Table 1 indicate that the indicators “strong body” (78%), “basic needs fulfilled” (72%), “lack of disease” (63%) and “clean environment” (44%) were valued by almost half or more than half of the students as important health dimensions. This indicates that students viewed health in both negative and positive dimensions.

The following sections outline findings and statements from the analyses compared to students' health conceptualizations (see Tables 1 & 2).

Textbook definition

Thirty-two percent of the students recited the textbook definition given by WHO (1986) in their compositions. This might be because Kenyan student teachers at least have 12 years of formal schooling and exposure to Science and Home Science teaching where they are trained in WHO's health definition, before they enrol in a TTC.

Bodily concepts and environmental factors

“Bodily capital” (Bourdieu, 1986; Meinert, 2004) refers to health as the experienced relationship between socio-economic factors and health. The categories “strong body” (78%), “basic need fulfilled” (72%) and “lack of disease” (63%) were reported by the majority of students as important health determinants. In subsistence economies, including most of rural Kenya, acquiring enough food, working in the fields and avoiding sickness are regarded as

important facets of being healthy. Therefore the body is regarded as an important carrier of health capital. These concepts also are continuations of the biomedical health concept students have acquired during many years of schooling. At TTC bodily capital could also be seen in the way the body was used as an expression of social and sexual capital. During free time, female students often wore short skirts and low-cut jeans as a way of communicating bodily capital, though such clothing was forbidden within the college compound in all colleges. The complex of bodily strength, physical appearance and health was visible in many students' health compositions:

In my own personal opinion, I fully believe that a person's health can only be confirmed in the hospital after having done several tests on the blood and physical outlook of a person. This is because from the physical outlook one may appear to be very healthy but suffering very serious diseases internally. (Male student, 21 years)

Other students had more minimalistic understandings of health, which were coupled with bodily functions. For instance, a 22-year old male student wrote the following health definition: "A person is said to be healthy or can be detected healthy when he or she is still breathing".

Good mood, stress-free, and mental adjustment

Twenty-three percent and 17% respectively perceived "good mood" and "stress-free" as important for being and becoming healthy, whereas "mental adjustment" was considered important by only 4%. Two students' compositions demonstrated how many of the students connected positive emotions to social relations and health:

A person is said to be healthy when he or she is able to conduct normal activities with great desire and happiness without complaining of any hardship. Health can be promoted by cheering up others, healing the physically sick, talking to the emotionally disturbed and praying for those who have loosed hope as well as advising those who are stuck. (Male student, 21 years)

A healthy person is always happy while unhealthy persons may look gloomy and even confused. (Female student, 21 years)

Good manners, social relations and family issues

Falling sick and needing attention either for oneself or for relatives was something many students were concerned about. In a setting with limited resources and opportunities, it is important to establish and maintain good social relations. Consequently, 17% of the students felt that good social relations were important factors for health. The social and intersubjective nature of the understanding of health (Whyte, cited in Meinert, 2004, p. 13) was reflected in the way students thought about health and illness. A 20-year-old female student wrote: "A healthy person shows good behaviour and have good relationship with people".

Eriksen and Sørheim (2003, p. 117) discuss two ideal types of societies, a “modern” society with an individualistic culture and a “traditional” society with a collective culture. According to Eriksen and Sørheim, the tradition-bound family is characterised by a complex system of communal obligations. The individual’s rights and opinions are of lesser importance here than the continued existence and survival of the family system. Possibly this also influenced how many students connected social aspects and health to individual moral qualities:

Again if you want to remain healthy you should avoid running here and there especially according to marriage because nowadays we have a disease called HIV/AIDS this one is our current problem so to avoid this you must be faithful to married people, unmarried go for check up first. (Female student, 30 years)

Other students wrote more implicitly about how to discover the health status of a person, as connected to discovering the moral status of the person:

By just having a closer look at them and also by observing them for a duration of time. Also by looking at their eyes you can know they are healthy or not by looking whether they involve themselves in activities. (Female student, 23 years)

Becoming learned and exposed

Nine percent of the students associated health with “learnedness” and issues of becoming “exposed.” “Learned” and “exposed”—not “educated” and “experienced”—signalled how students embraced the issue of being schooled as a symbolic value and something that added status and prestige to their personal capital. Studies have demonstrated how parents’ educational background has significance for children’s health (Katahoire, 1998), and how schooling and “learnedness” are experienced as important factors for being and becoming healthy (Meinert, 2009); in local terms, “gifts of education” (Jacobsen, 1997). In many places in Kenya, investment in education is expected to give economic, social and cultural return among others through an eventual employment in “white collar-jobs”, which is the symbolic reference to jobs that require office clothing. Becoming learned and exposed is therefore associated with other positive assets such as being healthy, for instance in that one is able to read and use written instructions for medicine (cf. Meinert, 2004). For some students, learnedness was attributed to thinking skills: “A healthy person is able to think wisely” (male student, 24 years). Other students perceived learnedness more literally: “Once educated they [learned people] also proclaim and educate others on need of preventing diseases” (male student, 21 years).

Good appearances

Seventeen percent of the students mentioned good appearances such as clothing and aesthetical appearances as important aspects of health. For instance, students referred to HIV/AIDS infections by its bodily signs, by calling it “slim disease”. In a setting with high HIV/AIDS prevalence, it was probably important for students to dissociate themselves from the disease, poverty and lack of food in general, and therefore to appear “fat, oily, brown

and smooth”, as some students mentioned as signs of being healthy. Being able to dress well was another characteristic associated with health. Mostly people with a monetary income could afford what was considered “proper clothing” and “good appearances”. Since money and being able to buy clothes, cream and soap for instance, also were perceived assets of being able to cater for one’s health, a poor physical appearance was attributed to inferior health:

You can detect, if a person is healthy by his or her body characteristics. This happens when you may see a person being masculine, smooth skin and soft to all parts of the body and normally be smart. (Male student, 22 years)

Religious aspects and spirituality

Nine percent of the students associated health with religious aspects. Probably this was due to a complex of factors, including Kenya’s colonial past. The first schools and TTCs in Kenya were established by British missionaries (Sifuna & Otiende, 2006), and many of today’s local health clinics in the rural areas are run by local missionaries. A male 24-year-old student wrote in his composition: “Pray/praise God every time [for good health]”. A widespread traditional use of herbal medicine and witchcraft, for instance among the ethnic minority the Luo people in Kenya (Abe, 1981), probably also influenced students’ perceptions of the concept of health to include spiritual aspects in their health perceptions.

Empowerment and self-decision

The Western inspired term “empowerment” has often been used in connection to health and health promotion (WHO, 1986), but is a relatively new concept in health research in low income countries. Among student teachers it had a certain impact since 16% of the students mentioned self-decision and empowerment as important determinants for health in the compositions. Becoming “learned” and “exposed” meant acquiring a new, empowered and self-decisive identity:

Personally I can promote health by educating the public by participating in public health programmes to raise awareness. Also by pressing to the government through peaceful demonstration to ask them to take the matters of health serious than ever. (Male student, 19 years)

Material and economical wealth

During the fieldwork it became apparent that the vast majority of students came from non-urban settings, that is, rural areas, where primary health care is scarce. Here health is a resource, which in many instances depends on whether one has access to money and schooling. Material wealth was considered to have more practical influence on health:

Apart from gaining knowledge [at school] you can also acquire a job opportunity and this can help stabilize yourself financially, health wise and also materially. (Female student, 24 years)

Conceptual changes during TTC

Table 2 describes the changes in relative importance of various factors and conceptualizations of health between first and second year.

Table 2 Student Teachers' Health Conceptualizations at 1st ($n = 576$) and 2nd Year ($n = 355$)

Health concepts	No. of 1 st year students reporting concept		No. of 2 nd year students reporting concept	
	n	(%)	n	(%)
Textbook definition	177	(31)	122	(34)
Lack of disease	367	(64)	215	(61)
Lack of pain	14	(2)	18	(5)
Clean environment	264	(46)	146	(41)
Basic needs fulfilled	404	(70)	263	(74)
Strong body	468	(81)	260	(73)
Good mood	123	(21)	94	(26)
Stress-free	69	(12)	87	(25)
Mental adjustment	27	(5)	8	(2)
Good manners	15	(3)	11	(3)
Good social relations	75	(13)	79	(22)
Family issues	6	(1)	4	(1)
Becoming learned	44	(8)	36	(10)
Good appearances	92	(16)	64	(18)
Religious aspects	40	(7)	42	(12)
Self-decision/empowerment	66	(11)	77	(22)
Being wealthy	156	(27)	99	(28)
Other	4	(1)	1	(<1)

As the students could give more than one answer, the sums are greater than 576 and 355, respectively (100%).

Conceptualizations with increased importance for the concept of health

The results in Table 2 indicate that mental, social, religious, cultural, aesthetical, political and critical aspects of health, that is, all aspects other than bodily and material aspects of health, in general either maintained or increased their relative importance during the course of TTC training. The largest increases were found in mental aspects such as “stress-free” (from 12% to 25%), social aspects such as “good social relations” (from 13% to 22%), religious aspects (from 7% to 12%), and political aspects such as “self-decision/empowerment” (from 11% to 22%), whereas aspects such as “good manners”, “family issues”, “becoming learned”, “good appearances” and “being wealthy” only maintained or slightly increased values. An exception is “lack of pain” (increased from 2% to 5%).

Conceptualizations with diminished importance for the concept of health

Contrary to popular beliefs about how teacher training has experienced an ascendance of science (Cochran-Smith, 2004) which potentially results in increased belief in the importance

of science, students' health concepts generally developed to being less "biomedically" oriented over the course of teacher training. The concept "Lack of disease" decreased from 64% to 61%, "clean environment" from 46% to 41%, and "strong body" from 81% to 73%. "Basic needs fulfilled", however, increased (from 70% to 74%).

Discussion

The concept of health

Students' health conceptualizations appeared to be a distinctive mixture of biomedical health knowledge; steep social hierarchies based on kinship, gender, age and social position in the college; peer learning and socialization; and cultural, aesthetical, religious and political aspects of life and health in general. Diseases, resource deficiencies, institutional bureaucracy, peer-socialization, colonial and missionary past, and globalization of Western culture were some possible explanations of why students experienced and constructed their understanding of health in relation to different local moral worlds (Kleinman, 1992), taking the most appropriate and influential from each. Local moral worlds are contexts of shared experience, which are particular, intersubjective, and constitutive of the lived flow of experience in the micro contexts of daily life (Kleinman, 1992, pp. 171-172). Students' health conceptualizations could thus be defined as complex interplays of social, cultural, bodily and economic resources, experiences and action possibilities associated with the "good life", with reference to similar studies of health conceptualization in East Africa (cf. Meinert, 2004).

Changes in everyday settings and concepts of health during years at college

For many students, college is the first time they are away from home and family. Therefore college life for many students represents a new social and cultural universe, which influences the way they think about and act in relation to health. At college, students are confronted with the opposite gender and new ways of socializing than in the rural home context, where gender roles often are more separated, and where steep hierarchies of age, gender and generations often determine how social control and discipline is exercised (Onyango-Ouma, 2000). However at college most students seem to have more freedom than they have at home to socialise with peers and they can therefore better form individual opinions. Some of the students' aspirations for empowerment can be regarded as resistance against a disciplinary college culture, that is, a counterculture against the formal system of TTC (cf. Holland & Eisenhart, 1990; Willis, 1977) that develops as resistance towards what some students experienced as a disciplinary college context. However, being in a setting with increased freedom and opportunities for enlightenment is a good starting point for learning to decide for oneself in matters of one's life and health.

Students increasingly experienced mental factors such as good mood and being stress-free as important factors of health. The college nurse reported that an increasing number of students during their second year suffered from heartburn and stress symptoms—"hapa-hapa" syndrome (Kiswahili; meaning "here-here")—which referred to a number of indefinite bodily symptoms. This could be a reason why students attributed "stress-free" and "good mood" as increasingly important factors for health.

Social determinants, especially good social relations, had an increased effect on students' perceptions of health. As Levine and White (1986) note, it is the social relations and attachments which make individuals' choices meaningful. It is what and how the reference group - other students - thinks, acts and feels, which becomes a meaningful moral universe for students, and this is true also in the way health is constructed. If social relationships were not considered meaningful and significant in students' local moral worlds, students would most likely not have emphasised good social relations as important for health, the way they did. In the same way, students increasingly emphasised religious aspects as important determinants for health. Most colleges provide space and time for students to engage in religious communities, and this possibly had an effect on how students emphasised religious aspects as important for being and becoming healthy.

Though students became "learned" and "exposed" as a consequence of being students at TTCs, the health determinant "becoming learned" increased only from 8% to 10% during the years in college. One possible explanation is that students experience aspects related to the peer culture, for instance social determinants, as more important than the issue of learnedness in comparison to health and life at TTC. Similarly, the biomedical aspects of health seemed to decrease in importance. Biomedical health education is a result of what has been referred to as "ascendance of science in teacher education as the presumed solution to most educational problems" (Cochran-Smith, 2004, pp. 6-7). Students are exposed to the biomedical version of health during Health Education lessons at TTCs. Nevertheless, they do not seem to attribute this learning to their health perceptions. Probably other competing factors, such as peer culture, have more influence on how students think and act in health matters.

Conclusion

This paper demonstrates that Kenyan student teachers in general have comprehensive health conceptualizations, but also that teacher education influences these conceptualizations. However, Health Education lessons, where students are taught biomedical health knowledge, are probably not the dominant factor for how students develop their perceptions about health. Rather it is other contextual factors, such as peer socialization, increased access to religious communities, and individual aspirations for autonomy away from family and homes that lead students to think differently about health. Cochran-Smith (2004, p. 3) argues that "teacher quality" has emerged internationally as a significant factor in student teachers' educational achievement, yet there is no consensus about how to define or achieve it. With this paper we might have reached one step further to acknowledging that Kenyan teacher education is a positive resource in the Kenyan health promoting project, since it make students think more holistically and comprehensively about health.

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Biography

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College student snacking behaviour pilot study

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Abstract

This study examined the snacking behaviour of undergraduate college students using a comprehensive survey that included a Healthy Snacking Knowledge Test (HSKT), a Snack Frequency Questionnaire, a survey of psychosocial correlates related to snacking behaviour (Situational Self-Efficacy, Barriers to Healthy Eating, and Transtheoretical Model of Behavior Change), and demographic information. There were 105 student participants from two Midwestern universities. Results show 2.6 mean snacking occasions per day, and the snack food selections tended to be high in nutrient density. Upper classmen had more knowledge about healthful snack options than freshmen. These students were most confident about healthful snack choices in difficult or inconvenient settings. The main predictors of healthful snack consumption were the academic year, the higher level of stage of change, and the difficult/inconvenient subscale of snacking self-efficacy.

Introduction

In the last 30 years, the number of snacks consumed in one day by Americans has doubled and the percentage of adults who snack has increased from 59 to 90 percent (United States Department of Agriculture (USDA), 2010). Frequent snacking has been reported in adults 19 years and older (Piernas & Popkin, 2010a; Piernas & Popkin, 2010b). For the college student these snacks may be consumed in addition to meals or in place of meals. Each day snacks provide between 25-28% of the total calories consumed by college students (USDA, 2010). With a propensity for salty, high-fat, energy snacks and/or beverages, snacking has been identified as contributing to obesity (Guh *et al.*, 2009; Ogden & Carroll, 2010; Flegal, Carroll, Ogden, & Curtin, 2010). The American College Health Association (2005) reported that 30% of college students are either obese or overweight in the United States. Alternatively, snacking may increase the intake of food items such as fruits and whole grains which may be low or lacking in the diet of college students (Racette, Deusinger, Strube, Highstein, & Deusinger, 2008; Sebastian, Cleveland, & Goldman, 2008).

Few instruments exist to assess the snacking behaviour of college students. Knowledge of healthful snacks, stage of change, and environmental influences have been studied as influences on snacking (Cluskey & Grobe, 2009; Ha & Caine-Bish, 2009; Driskell, Young-Nam, & Goebel, 2005; Lloyd-Richardson, Bailey, Fava, & Wing, 2009; Racette *et al.*, 2008; Silliman, Rodas-Fortier, & Neyman, 2004). But one comprehensive investigation of the snacking knowledge, snacks consumed, eating episode frequency, associated psychosocial correlates, self-efficacy barriers, stages of change, and demographics of college students appears to be lacking and might prove helpful in predicting snacking behaviour. This information could guide initiatives to promote healthful snacking among college students.

Review of literature

Establishment and maintenance of a healthful diet is difficult for college students as they transition away from home for the first time (Cluskey & Grobe, 2009). Students have reported that campus cafeterias do not provide many healthful options, and students living off-campus have stated that eating healthful meals is more expensive and requires extra time (Cluskey & Grobe, 2009). Statistically significant weight gains and increases in BMI have been identified in college students (Racette *et al.*, 2008). As people become overweight or obese, mortality and morbidity risks and co-morbidity conditions increase (Guh *et al.*, 2009).

The daily energy intake was found to be associated with the number of eating occasions; eating more than three times per day was found to be associated with overweight and obesity. Half of all Americans eat 6.6 times per day (Popkin & Duffey, 2010). Environmental factors such as erratic class schedules have been reported to impact the number of times college students snack and the food items selected (Devine, 2005). According to the United States Department of Agriculture, over 50% of college students snack two to three times per day (USDA, 2010). In two studies, college students snacked on between one and four snacks each day (Driskell *et al.*, 2005; Greaney *et al.*, 2009). Results from studies indicated that knowledge of healthful foods did not necessarily result in healthful eating by college students (Cluskey & Grobe, 2009; Weijzen, deGraaf, & Dijksterhuis, 2008).

Other studies have focused upon the barriers and enablers of weight management and eating behaviours (Greaney *et al.*, 2009). The transtheoretical model (TTM) developed by Prochaska (1979) has been used to investigate fruit and vegetable intake decisions, self-efficacy, and stages of change in young adults (Horacek *et al.*, 2002). The TTM has been used in the investigation of healthful snacking correlates of the snacking behaviour exhibited by Midwestern women (Schunk, McArthur, & Maahs-Fladung, 2009). Another measure used in other studies is the snacking self-efficacy assessment (Huang *et al.*, 2003) which consists of three subscales: a negative/affective subscale indicating the emotional state of the participant; a positive social engagement subscale; and a difficulty with accessing healthful snacks subscale. This assessment is used to identify correlates or predictors of snacking behaviour.

The Body Mass Index (BMI) indicates body fatness and is used to screen people for weight categories such as overweight (25.0 and 29.9 kg/ m²) or obesity (BMI > 30.0 kg/m²). A higher daily energy intake was found to be associated with overweight or obesity BMI values (Howarth, Huan, Roberts, Lin, & McCrory, 2007).

Different aspects of eating and snacking by young adults have been investigated, but to our knowledge no one comprehensive snacking study of college students has been completed. This comprehensive study should incorporate a survey of psychosocial correlates, a snacking knowledge test, snacking consumption data, and demographic information. The results could provide a comprehensive view of college student snacking behaviours, identify predictors of healthful snacking, and guide the development of initiatives to encourage healthful eating.

Objectives

The objectives of this study are to investigate the relationship between knowledge of healthful snacks, snacking choices, actual snacking behaviour, and psychosocial correlates. A second objective is to identify predictors of healthful snack consumption by investigating the knowledge of healthful snacks; the types of snacks and snacking frequency; psychosocial correlates; stages of change; self-efficacy barriers; and demographic information to include academic year, gender, height, weight and BMI in college students.

Methodology

Participants and recruitment

In this cross-sectional study, 105 undergraduate students enrolled in family and consumer science programs at two Midwestern universities were recruited using convenience sampling. Faculty, not involved in this study, asked students in their classrooms to participate. All students who were willing to complete the surveys were included in our sample. Students completed each survey and immediately returned it to the researchers. The study was granted approval through the Committee on Human Subjects research at both universities, and all students gave written consent after presentation of the study objectives and methods.

Data collection

The measures of snacking behaviour were based upon a self-administered survey instrument developed by Schunk *et al.* (2009) that consists of four parts: a Healthy Snacking Knowledge Test (HSKT); a Snack Frequency Questionnaire (SFQ), from which a Snack Quality Index (SQI) is developed; psychosocial correlates related to snacking behaviour (Situational Self-Efficacy, Barriers to Healthy Snacking, Transtheoretical Model of Behavior Change) and demographic information.

Healthful snack knowledge test (HSKT)

The HSKT consisted of 14 items: the first 8 items ask respondents to check characteristics of healthy snacks (0 = no; 1 = yes) that include four healthful descriptors and four unhealthful descriptors (reverse scored). The second 6 items ask respondents to choose the healthiest from among three snacks, the one with the lowest or highest of certain characteristics (e.g., "Which snack has the lowest amount of salt?" and "Which snack has the highest amount of saturated fat?"); these were scored 1 = least correct to 3 = most correct. Thus, scores on this test could range from a 6 to a 26.

Snack frequency questionnaire (SFQ)

The SFQ is designed to assess the frequency of consumption of healthful and unhealthful snacks. Respondents are asked to indicate the frequency with which they consume 19 healthful (lower calorie, higher fibre and/or nutrient density) and 20 unhealthful (higher calorie, lower fibre and/or nutrient density) snacks with the following temporal categories: never, <1 day/ week, 1 day/ week, 3-4 days/ week, 5-6 days/week, once/day, 2/day and ≥ 3 /day, scored from 1 = never to 8 = ≥ 3 /day for healthful snacks and reverse scored for unhealthful snacks (8 = never to 1 = ≥ 3 /week). We further created three consumption

categories: low frequency consumption (<1/week), moderate frequency consumption (1-4/week) and high frequency consumption (≥ 5 /week). In order to scale unhealthful and healthful snacking the same and to use both in the creation of the Snack Quality Index (SQI; students are rewarded for healthful snacking and penalised for unhealthful snacking) we assigned "1" to the never category. Thus, when a participant "never" partook of an unhealthful snack, it was reverse-coded to an 8, or the highest possible score on the scale corresponding to the most healthful snacking pattern.

Snack quality index (SQI)

The SQI, derived from responses to the SFQ, assesses the healthfulness of snacking behaviour. The index is calculated by assigning scores to the frequency of healthful and unhealthful snack consumption: healthful snacks received a score of 5 = 1/day, 4 = 5-6/week, 3 = 3-4/week, 2 = 1-2/week, 1 = <1/week; unhealthful snacks were reverse scored (5 = <1/week to 1 = 1/day). This total score could range from 39-195 (19-95 for healthful snacks; 20-100 for unhealthful snacks).

Snacking self-efficacy (SSE)

The SSE is designed to assess respondents' situational self-efficacy (their confidence to consume healthful snacks under differing circumstances). Respondents were asked to rate how confident they were in their ability to consume healthful snacks in 17 different situations, with each item scaled from 1 = not at all confident to 5 = very confident. The questions were categorised into three subscales: a negative affective subscale (7 items, $\alpha = .89$) that tapped situations associated with emotional stress, for example, "When I am depressed or down"; a positive social subscale (4 items, $\alpha = .86$) that tapped situations associated with social celebrations, for example, "While having a good time with friends at a party"; and a difficult or inconvenient subscale (5 items, $\alpha = .79$) that tapped situations challenging to the use of healthful snacks, for example, "When I have to prepare healthy snacks for myself".

Healthful snack barriers (HSB)

The instrument developed by Schunk *et al.* (2009) was adapted to assess barriers to healthful snacking as perceived by college student participants. Respondents were asked to rate the importance of 16 potential barriers, arranged in four subscales: taste barriers (3 items, $\alpha = .67$) for example, "Don't enjoy the taste"; practical barriers (9 items, $\alpha = .83$), for example, "Too expensive." In this study, 5 items were added to the practical barrier subscale that were unique to college students, for example, "Friends or roommates won't eat them"; internal cue barriers (2 items, $\alpha = .70$), for example, "Don't give me the energy I need"; and barriers to the awareness of healthful snacks (2 items, $\alpha = .93$), for example, "Don't know where to find healthy snacks." Responses were scored from 1 = not at all important to 5 = very important.

The Transtheoretical Model (TTM)

The TTM assesses participants' stage of change or readiness to change. Respondents were asked to select one phrase that best described their intention to eat healthful snacks. The first three phrases represent the pre-action stages (pre-contemplation, contemplation, preparation) and the last three phrases the action stages (action, maintenance, termination). Scores ranged from 1 = pre-contemplation to 6 = termination.

Demographic information

Respondents were asked to self-report their age, academic year, gender, race/ethnicity, and height and weight, used to calculate their BMI (kg/m^2). Weight was classified as underweight ($\text{BMI} < 18.5 \text{kg}/\text{m}^2$), normal weight ($\text{BMI} = 18.5\text{-}24.5 \text{kg}/\text{m}^2$), overweight ($\text{BMI} = 25\text{-}29.5 \text{kg}/\text{m}^2$) and obese ($\text{BMI} \geq 30 \text{kg}/\text{m}^2$).

Statistical analysis

The SPSS (version 15.0, SPSS Inc., Chicago, IL) was used for statistical analysis, with a significance of $P < .05$. Descriptive statistics were used for mean and standard deviation and frequencies of responses. We conducted an ANOVA (controlling for BMI) to assess the influence of academic year (not including the nine freshmen students) on HSKT and SQI with post-hoc multiple comparisons with a Scheffé adjustment. Partial correlations were run controlling for academic year and BMI, to examine the relationship between the healthfulness of snacking behaviour (SQI) and psychosocial correlates. Finally, a hierarchical regression analysis was conducted to assess the predictive ability of each self-efficacy subscale and the stages of change variable on the outcome SQI, controlling for academic year and BMI. Because different results in the relationship between snacking and BMI have been reported by researchers and because only 4.9% (5 students) of this dietetic had a BMI $> 30 \text{kg}/\text{m}^2$, this investigation controlled for BMI.

Results (demo/HSKT/Quality of Snacking Behaviour/Psycho Correlates)

Frequencies of consumption were computed for each of the 19 lower calorie (healthful) and 20 higher calorie (unhealthful) snack choices in the snack frequency questionnaire. Table 1 displays these results according to lower frequency (students reported consuming the snack less than once per week), moderate frequency (students reported consuming the snack between one and four days per week), and higher frequency (students reported consuming the snack at least five days per week).

These choices were used to compute the SQI (Schunk *et al.*, 2009) for each participant. For the entire sample, the SQI ranged between 101 and 151; the median score was 128, the mean was 126.68, and the standard deviation was 8.45. Skew (-.22) and kurtosis (-.74) were well within limits for univariate normality.

Table 1 Consumption frequency of higher- and lower- calorie snacks by students

Type of snack	Lower frequency		Moderate frequency		Higher frequency	
	n	%	n	%	n	%
Popcorn, added fat*	100	95	5	5	0	0
Popcorn, low-fat	95	91	9	9	1	1
Chips, regular*	79	75	21	20	3	3
Chips, low-fat	68	65	33	31	2	2
Fruit canned in light/heavy syrup*	88	84	15	14	2	2
Fruit, fresh	6	6	40	38	56	53
Yogurt, regular*	78	74	22	21	4	4
Yogurt, low-fat	51	49	39	37	15	14
Cookies, regular*	82	78	20	19	2	2
Cookies, low-fat/low-sugar	94	90	10	10	0	0
Ice cream, regular*	89	85	14	13	1	1
Ice cream, low-fat/low-sugar	90	86	14	13	0	0
Fruit drinks/ades*	78	74	21	20	6	6
Real fruit juice	47	45	36	34	21	20
Cheese, regular*	24	23	56	53	24	23
Cheese, low-fat	53	51	44	42	7	7
Milk, whole*	98	93	5	5	2	2
Milk, low-fat/fat-free	21	20	24	23	58	55
Coffee with cream/sugar*	75	71	11	11	15	14
Coffee without cream/sugar	81	78	10	10	11	11
Pudding, regular*	102	97	3	3	0	0
Pudding, low-fat/low-sugar	90	86	12	11	1	1
Crackers, regular*	58	55	39	37	7	7
Crackers, low-fat	59	56	37	35	8	8
Cottage cheese, regular*	93	89	9	9	1	1
Cottage cheese, low-fat	79	75	21	20	5	5
Other higher-calories snacks*						
Pastry	80	76	23	22	2	2
Chocolate candy/bars	82	78	18	17	2	2
Candy, hard or soft	77	73	21	20	5	5
Nut/seeds	38	36	45	43	20	19
Pizza	75	71	26	25	2	2
French fries	90	86	14	13	1	1
Other lower-calorie snacks						
Pastry, low-fat/sugar	91	87	13	12	0	0
Choc candy/bars, low-fat/sugar	100	95	5	5	0	0
Candy, hard or soft/sugarless	96	94	5	5	4	4
Vegetables	14	13	44	42	44	42
Drinks						
Regular soft drinks*	93	89	6	6	5	5
Diet soft drinks	68	65	18	17	19	18
Bottled water	12	11	15	14	77	73

Lower frequency = consume the snack less than once per week, Moderate frequency = consume the snack between 1-4 days per week, Higher frequency = consume the snack at least 5 days per week.

*Higher calories snacks

Descriptive statistics related to the three subscales of the snacking self-efficacy scale and the four subscales of the barriers to healthful snacking scale are reported in Tables 2 and 3, respectively. We found significant difference in mean score for the three subscales of the self-efficacy scale (Wilk's Lambda = .803, $F(2,103) = 12.64$, $p < .001$) and for the four subscales of the healthful snack barriers scale (Wilk's Lambda = .590, $F(3,102) = 20.74$, $p < .001$). Post-hoc comparisons with a Bonferroni adjustment for the self-efficacy subscales revealed that aggregate scores on the difficult/inconvenient subscale ($M = 3.71$; $SD = .76$) were significantly higher ($p \leq .01$) than both the negative/affective subscale ($M = 3.34$; $SD = .95$) and positive/social subscale ($M = 3.32$; $SD = 1.0$). Thus, students tended to be most confident about healthful snacking when faced with difficult or inconvenient situations and least confident when emotionally distressed or in positive social settings.

Table 2 Mean ratings* on self-efficacy snacking subscales for students ($n = 105$)

Item	<i>n</i>	Mean	SD
Negative/affective subscale (mean subscale score 3.3, SD 1.0)			
When I am bored	105	3.5	1.3
When I am anxious or nervous	105	3.4	1.3
When I am angry or irritable	105	3.5	1.3
On days when things are not going my way and I feel frustrated	105	3.4	1.2
When I have had an argument with someone close to me and I feel upset	105	3.3	1.2
When I have experienced a tough day and am not feeling good about myself	105	3.4	1.3
When I am depressed or down	105	3.1	1.1
Difficult/inconvenient subscale (mean subscale score 3.7, SD 0.8)			
When I have to prepare healthful snacks for myself	105	4.5	1.0
When eating a less healthful snack is more convenient	105	3.5	1.2
When mostly less healthful snacks are readily available	105	3.3	1.3
In situations when eating a healthful snack is just too much trouble	105	3.2	1.1
When substituting a healthful snack for the less healthful one I really want is a pain	105	3.7	1.1
When eating a healthy snack means I have to prepare it	105	4.1	1.0
Positive/Social subscale (mean subscale score 3.3, SD 1.0)			
While having a good time with friends at a party	104	3.1	1.3
In situations in which I am celebrating with friends and family	104	3.2	1.3
While eating out at a restaurant with close friends	105	3.6	1.1
While enjoying the company of others at a picnic or barbeque	105	3.5	1.1

*Items scored from (1 = not at all confident) to (5 = very confident)

Table 3 Mean ratings* on barriers to healthful snacking for students (n = 105)

Item	Mean	SD
Taste barriers subscale (mean subscale score 2.5, SD 1.0)		
Don't enjoy the taste	3.3	1.5
Not salty enough	2.1	1.3
Not sweet enough	2.0	1.2
Practical barriers subscale (mean subscale score 2.5, SD 0.8)		
Not readily available	3.2	1.2
Take too long to prepare	2.8	1.2
Too expensive	3.3	1.3
Family won't eat them	2.2	1.3
Do not know how to prepare	1.9	1.2
Preparation would limit/interfere/takeaway from study time	2.6	1.4
Friends/roommates do not like	1.9	1.1
Boyfriend/girlfriend does not like	1.8	1.1
Difficult to take on campus	2.6	1.4
Internal cues barriers subscale (mean subscale score 2.8, SD 1.2)		
Doesn't satisfy a craving	3.2	1.4
Doesn't give me the energy I need	2.5	1.4
Awareness cues barriers subscale (mean subscale score 1.8, SD 1.1)		
Don't know how to choose healthful snacks	1.8	1.2
Don't know where to find healthful snacks	1.9	1.2

*Items scored from (1 = not at all important) to (5 = very important)

Post-hoc comparisons with a Bonferroni adjustment for the healthful snack barriers subscales revealed that aggregate scores on the taste barriers subscale ($M = 2.48$; $SD = 1.03$) were not significantly lower than the practical barriers subscale ($M = 2.47$; $SD = .82$), but were lower compared to the internal cues subscale ($M = 2.82$; $SD = 1.20$; $p = .002$) and the barrier awareness subscale ($M = 1.81$; $SD = 1.14$; $p \leq .001$). Aggregate scores on the practical barriers subscale were significantly lower than the internal cues subscale ($p = .004$) and higher than the barrier awareness subscale ($p \leq .001$); scores for the internal cues subscale were significantly higher than the taste barriers subscale ($p = .004$), than the practical barriers subscale ($p = .02$), and higher than the barrier awareness subscale ($p \leq .001$). Thus, students reported that knowing how to choose healthful snacks and knowing where to find healthful

snacks, combined to create the weakest barrier to their healthful snacking; whereas the two items for internal cues addressing that healthy snacks often don't satisfy cravings or provide needed energy combined to create the strongest barrier to healthful snacking.

The students did remarkably well on the Healthful Snack Knowledge Test (HSKT) which had a possible range from 1-26. Scores of participants in this study ranged from 20 to 26 ($M = 25.05$, $SD = 1.27$) and the median score and mode was 26. A supplemental analysis was conducted to examine whether or not year in school made a difference in total score on the HSKT, controlling for BMI. The mean score for the 28 sophomores was 24.43 ($SD = 1.50$); for the 29 juniors was 25.35 ($SD = .97$); and for the 39 seniors was 25.52 ($SD = .91$). The effect for Academic Year was significant: $F(2, 92) = 7.68$, $p = .001$; the test of homogeneity of variances was not significant so that assumption stood. Post-hoc multiple comparisons with a Scheffé adjustment demonstrated that seniors scored significantly higher than sophomores ($p = .001$) but not juniors ($p = 1.00$); juniors also scored significantly higher than sophomores ($p = .01$).

Inspection of descriptive statistics for the transtheoretical model (TTM) stages of change component revealed 95% of the total sample, or 100 students, reported their best intention regarding the eating of healthful snacks was in the action stage: 20 (19%) students selected the action phrase, 43 (41%) students selected the maintenance phrase, and 37 (35.2%) students selected the termination phrase. This sample of dietetic students, regardless of academic year, reported strong intentions to actively eat healthy snacks.

Partial correlations were run between HSKT and SQI ($n = 105$), controlling for academic year and BMI. Results for the partial correlation between SQI and responses to the stages of change question for the TTM ($r = .31$; $p = .001$) for the sample. Thus, more healthful snacking for all was significantly and positively associated with higher order stages of change scores on the snacking test.

In addition partial correlations were run, controlling for academic year and BMI, between SQI and each of the snacking self-efficacy subscales and each of the healthful snack barriers subscales. Each of the three self-efficacy subscales was significantly associated (one-tailed tests) with SQI: negative affect ($r = .24$, $p = .007$); difficult or inconvenient ($r = .31$, $p = .001$); and positive social ($r = .24$, $p = .02$). None of the four healthful snack barriers subscales was significantly associated with SQI.

Building upon the correlation results reported above a hierarchical regression analysis was conducted to assess the predictive ability of the stages of change variable and each self-efficacy subscale on the outcome SQI, controlling for academic year and BMI. First, a block of control variables including BMI and academic year was entered; this block explained 7% of the variance; $F(2, 102) = 3.96$, $p < .02$. Academic year was a significant predictor in this block ($\beta = .24$, $p = .01$), whereas BMI was not ($\beta = -.15$, $p = .11$). The second block explained an additional 9% of variance and included the stages of change predictor (controlling for the first block) and it added significantly to the overall model fit: $F(21, 101) = 10.36$; $p < .01$; significantly and positively predicting SQI ($\beta = .26$, $p = .008$). The last block of predictors included the three subscales of snacking self-efficacy and did not significantly add to the model fit, explaining only 4% more of the variance; however of the three self-efficacy

subscales, difficult/inconvenient approached statistical significance ($\beta = .18, p = .056$). Thus, based on these findings, the two snacking self-efficacy subscales were deleted and we re-ran the model. These results are reported in Table 4. This trimmed model explained 19% of the total variance, each block significantly added to the variance explained and controlling for academic year and BMI, the stages of change variable and the difficult and inconvenient subscale were both significantly and positively associated ($\beta = .20, p = .052$ and $\beta = .21, p = .043$, respectively) with higher levels of healthful snacking.

Table 4 Hierarchical regression analyses for predictors of snacking quality index ($n = 105$)

Predictor variables	Model 1 Controls			Model 2 State of change			Model 3 Difficult/Inconvenient		
	B	SE	β	B	SE	β	B	SE	β
Academic year	2.05	.82	.24*	2.01	.78	.24*	2.07	.77	.24**
BMI	-.33	.21	-.15	-.28	.20	-.13	-.18	.20	-.08
State of change				2.62	.81	.30*	1.78	.90	.20*
Difficult/Inconvenient							2.38	1.17	.21*
$F\Delta$			3.96*			10.36**			4.19*
R^2			.07			.16			.19
* $p \leq .05$ ** $p \leq .01$ (two-tailed tests)									

Discussion

The objectives of this study were to investigate the relationship between knowledge of healthful snacks, snacking choices, and actual snacking behaviour, and factors that influence this phenomenon; and to identify predictors of snacking behaviour. The snacking frequency reported was 2.6 occasions per day, consistent with the literature indicating one to four snacks are consumed per day by college age students. This population also appeared to know what made a snack healthful and the knowledge of seniors and juniors was significantly higher than that of freshmen and sophomores, as can be expected with the progressive courses in nutrition as indicated in other research studies. However, despite the high scores in knowledge, these students demonstrated low SQJ scores, indicating a disconnect between knowledge and behaviour which has been identified in other research. Two factors are proposed that may partly explain this phenomenon: first, the choice of “healthy” and “unhealthy” snacks is based primarily on caloric contribution and fat content of the snack items. Second, students were not asked to record whether the snacks were in lieu of skipped meals, or in addition to the meals. If consumed as meal replacement, the healthfulness of the snack may have been evaluated differently. Further, a relatively low percentage of our students were obese (4.9%) compared to the national average of 29.9% of college students. In this sample of students the focus was on the healthfulness of the snack food selections and the results indicate that the student choices of snacks were high in nutrient density and still healthful overall.

The findings regarding the three subscales of the snacking self-efficacy scale (i.e., difficult/inconvenient, negative/affective, and positive/social) of students were unique. Perhaps atypical of college students in general, the students in this study were most confident (self-efficacy) about healthful snacking in the face of difficult or inconvenient settings. It may be their knowledge of healthful snacking and its subsequent influence on physical health and well-being is a protective factor against such risks toward unhealthy behaviours. Or it could be that a combination of nutritional knowledge with the ease of transporting or accessibility of such high frequency healthful snacks such as bottled water, fresh vegetables, and fresh fruit contributed to this finding. One other factor the study did not assess was whether or not students ate their meals in food service settings or personal apartments. Upper division students who live near campus might return to their apartment for a snack or meal where healthful snacks are available or might provide their own healthful snacks via backpack when heading to school for the day.

This study extended the work of others by assessing the influence of known correlates of healthful snacking in a regression analysis with the SQI as the outcome variable. Two significant findings are shown in Table 4, Model 3. First, in Model 3, when the influence of academic year, BMI, stage of change are entered in Model 2 and thus, controlled for in Model 3, the addition of the difficult/inconvenient subscale measure from the snacking self-efficacy scale contributes positively and significantly above and beyond the other measures to the explanation of variance in participants' scores on the SQI. In regards to this subscale, the previous summarization holds when controlling for the influence of these other correlates, further strengthening that argument. In fact, it is suggested that applied research investigating the efficacy of preventive interventions focus on maximizing the concepts of the difficult/inconvenient subscale as a key to appropriate behaviour with this population. Second, Table 4, Model 3 demonstrates the positive and significant influence of (a) academic year, (b) higher levels of stage of change, and as mentioned previously, (c) the difficult/inconvenient subscale of snacking self-efficacy.

From these results it appears that nutritional knowledge matters. In addition, the self-reported stage of change matters. A possible interaction between nutritional knowledge and stage of change was investigated but was not found with this sample. Thus, these three predictors mattered most for this sample of undergraduate dietetic students: academic year, higher level of stage of change, and difficult/inconvenient factors. However, at the same time, a limitation worth noting in the final Model 3 is that only 19% of the variance in SQI was explained; in other words, 81% of the variance was left unexplained. Some of this variance may be addressed by including questions about the overall number of eating occasions to include meal and snack patterns; portion sizes of food items; definition of healthful snacks; other snack foods consumed; actual height and weight measurements; and the type, amount, and frequency of physical activity. To be more representative of all college students, this research might expand the sample to include a cross section of college students attending Midwestern universities.

Implications for future research and practice

Knowledge of nutrition and nutrient content of possible snack choices is vital to all consumers to make healthful snack choices. Consumption of unhealthy snacks, high in calories and fat, is

seen as a strong contributor to obesity. The reality is that providing people with more knowledge does not necessarily lead to improved snacking behaviour. This study has helped to elucidate aspects of healthy snacking behaviour and may help in effecting change. Identification of predictors of healthful snack selection and behaviour is new and should be further developed to further identify unhealthy snacking. A wider application is the contribution to increased understanding of the complexity of snacking behaviour, the possibility of disconnect between knowledge and practice, and the importance of examining factors that influence the snacking and eating behaviour of individuals. More research should be spawned to identify predictors of eating behaviours.

However, specifically, these researchers believe that this is the first study to investigate snacking behaviour specifically in undergraduate students who had taken at least one nutrition course. As future health professionals, knowing, from their own experience, the powerful influence of psychosocial correlates and readiness to change on snacking behaviour will greatly enhance their ability to provide effective counselling to individuals and communities. For educators, these outcomes will provide signposts to educational strategies in providing students with the necessary tools.

Biography

Dr Dallmeyer, Associate Professor of Family and Consumer Sciences at Bradley University, teaches Food Service Systems; Management in Food Services; Practicum in Foods, Nutrition, and Dietetics; Advanced Food Service Systems; Consumer Issues in Healthcare; and Study Abroad courses. Also, she taught dietetic and hospitality courses at Western Illinois University for over twenty-two years and served as the Associate Directory of the Centennial Honors College between 2006-2008. Before teaching at WIU, she was director of the undergraduate dietetic program at the University of Iowa. She completed her Ph.D. at the University of Tennessee. She has worked as a clinical dietician at Memorial Hospital in Belleville, Illinois; at Barnes Hospital in St. Louis, Missouri; at Indiana University Medical Center in Indianapolis, Indiana; and at OSF Saint Francis Medical Center in Peoria, Illinois. E-mail: mdallmeyer@bumail.bradley.edu

Jeannette Davidson, Professor of Family and Consumer Sciences, serves as Director of the Didactic Program in Dietetics and has served as the principal investigator of Bradley's Health and Aging Study for over ten years. She teaches Nutrition, Lifecycle Nutrition, Nutrition Assessment, Advanced Nutrition and Medical Nutrition Therapy. Dr Davidson completed a Ph.D. in Nutrition, Nutritional Biochemistry & Exercise Physiology from The Ohio State University. Additional research interests include obesity in children and adequate fuelling for recreational and athletic performance.

G. Kevin Randall, Associate Professor of Family and Consumer Sciences, earned his Ph.D. in Human Development and Family Studies with an emphasis in life span studies and a minor in gerontology from Iowa State University. His research focus covers both ends of the life span and includes an emphasis on factors

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Amanda Newell, Assistant Professor in the Department of Family and Consumer Sciences, teaches food and nutrition courses and serves as the Bradley University Dietetic Internship Director. Prior to teaching at Bradley, Ms Newell worked as a clinical dietician at OSF Saint Francis Medical Center in Peoria, IL. During graduate school she was a research assistant at the University of Illinois where her thesis focused on the chemopreventive potential of various herbal teas.

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Optimization of the pre-treatment process with acid cellulase enzyme to improve physical properties of handloom cotton fabric

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Abstract

Cotton is produced in over 50 countries worldwide, averaging 20-24 million tons per year. India is one of the largest consumers of cotton, accounting for about 60% of the total consumption. The handloom sector is known for its heritage and the tradition of excellent craftsmanship, but handloom cotton has some shortcomings, like higher maintenance costs for washing and ironing. It is also less preferred due to rough texture and low drapeability. Cellulase enzymes are extensively used in textile finishing to improve the hand of fabrics. The cellulolytic system of cellulase is composed of two exo-cellobiohydrolases, at least six multiple endoglucanases and two β -glucosidases. Exo-cellulases act on cellulose polymer chain ends and produce primarily cellobiose. Endo-cellulases act randomly along the cellulose polymer chains breaking very long polymers into shorter chains. β -glucosidases act on short, soluble oligosaccharides to produce primarily glucose. The careful control of enzyme treatment process variables, such as concentration, treatment time and temperature, are important for optimizing the cellulase enzyme activity for the enhancement of the product. Therefore, in the present study an attempt has been made to optimise conditions for the use of acid cellulase enzyme and evaluate the changes in physical properties like weight loss, moisture absorption, strength loss, bending length and crease recovery angle.

Keywords: Handloom Cotton, Acid Cellulase Enzyme, Swelling Agents

Introduction

Today the use of enzymes in textile processing is well established industrial technology. Being biological molecules and efficient catalysts, enzymes provide environmentally acceptable routes to replace harsh chemicals. Cellulase enzymes are highly effective in removing loose fibres from fabric surfaces, a process known as biopolishing (Etters, Lange, & Husain, 1999).

Handloom cotton has some shortcomings, like higher maintenance costs for washing and ironing. It is also less preferred due to rough texture and low drapeability. The annual reports of the handloom sector present a sorrowful picture of piling up of stocks in godowns (Sarvani & Balakrishnaiah, 2007).

The cellulolytic system of cellulase is composed of two exo-cellobiohydrolases, at least six multiple endoglucanases and two β -glucosidases. Exo-cellulases act on cellulose polymer chain ends and produce primarily cellobiose. Endo-cellulases act randomly along the cellulose polymer chains breaking very long polymers into shorter chains. β -glucosidases act on short, soluble oligosaccharides to produce primarily glucose (Karmakar, 1998).

The careful control of enzyme treatment process variables, such as concentration, treatment time and temperature, are important for optimizing the cellulase enzyme activity for the enhancement of the product. Therefore, in the present study an attempt has been made to optimise conditions for the use of acid cellulase enzyme and evaluate the changes in physical properties like weight loss, moisture absorption, strength loss, bending length and crease recovery angle.

Materials and methods

Fabric

Pure white handloom cotton fabric was procured from the market in Pantnagar (Uttarakhand).

Enzymatic treatment

The enzyme treatment was carried out in Metrex launderometer and consisted of commercial acid cellulase enzyme Americos Cellscos 450AP.

Test methods

Weight loss

Weight of the fabric samples before and after the treatment was calculated and percentage weight loss was calculated using the following formula:

$$\text{Weight loss (\%)} = \frac{(W1 - W2) \times 100}{W1}$$

Where W1 = Weight of the fabric before enzyme treatment

W2 = Weight of the fabric after enzyme treatment.

Moisture absorption

The moisture content of cotton fabric was determined using IS: 199-1973 test method. The percentage of moisture content in the test specimen was calculated by the following formula:

$$\text{Moisture, percent by mass} = \frac{(a - b) \times 100}{a}$$

where a = original mass, in g, of the test specimen, and

b = oven dry mass, in g, of the test specimen.

Strength loss

Raveled strip test method was used. The tensile strength was measured on the KMI electronic tensile strength tester. Strength loss (%) was calculated from the formula:

$$\text{Strength loss (\%)} = \left(\frac{S1 - S2}{S1} \right) \times 100$$

where S_1 = breaking strength before treatment
 S_2 = breaking strength after treatment.

Bending length

The bending length of the cotton fabric was determined on Eureka Cloth stiffness tester using IS: 6490-1971 test method. Samples of size 25 x 200 mm were cut from both warp way and weft way direction with the help of a template from different positions of the sample under test.

Crease recovery angle

The crease recovery angle of the cotton fabric was determined by IS: 4681-1968 test method. Warp way and weft way test specimens of 15 x 40 mm size were tested.

Results and discussion

Concentration

The F-value (1% level of significance) confirmed that there was a significant difference in the physical parameters related to different pH levels. It was also proved statistically by comparison of means that significant difference in the mean values of all physical parameters occurred among three concentration levels, that is, up to 1.5% concentration, after which no significant difference was found in concentration levels.

The results in Table 1 clearly demonstrate that the weight loss (0.99 - 2.99%) occurred with an increase in the enzyme concentration from 0.5 - 1.5%; however, further increase in concentration showed slight increase in weight loss. However, due to the unoptimised cellulase dosages, significant weight and strength loss may occur which may be fatal to the substrate. Due to this polishing effect some weight loss is observed, which however does not yet indicate any fibre damage (Buschle-Diller, Walsh, & Radhakrishnaiah, 1998).

It is clearly evident from the results (see Table 1) that the acid cellulase enzyme treatment slightly increased the tensile strength loss both in warp (0.38% - 0.41%) and weft (0.48% - 0.53%) direction as the acid cellulase enzyme concentration increased from 0.5% to 1.5%. However, it is important to maintain the fabric strength as it is a chief concern of processors using cellulase enzyme. Significant increase in moisture content, that is, from 2.26% to 3.06%, was found on increasing the concentration level from 0.5% to 1.5%.

The mean bending length in warp direction was 1.10 cm at 0.5% while it was reduced to 0.82 cm on increasing concentration to 1.5%, while in the case of weft direction the bending length was 0.93 cm at 0.5% and 0.67 cm at 1.5% concentration. Afterwards the increase in concentration showed a slight reduction in both warp and weft bending length. The significant increase in crease recovery angle both in warp (93° - 121°) and weft (108° - 129°) direction was recorded on increasing the concentration from 0.5% to 1.5%, after which insignificant increase in crease recovery angle with increase in concentration was recorded.

Results mentioned above revealed that handloom cotton exhibited major improvements in moisture content, bending length, and crease recovery angle, on increasing concentration up to 1.5%. Further increase in concentration showed insignificant improvements in physical properties. Thus, keeping in view all the physical properties studied, 1.5% concentration of acid cellulase enzyme was taken as optimum for the further study.

Table 1 Mean Value, Standard Deviation and F-value of Physical Tests at Different Concentrations of Acid Cellulase Enzyme on Handloom Cotton Fabric

Physical parameters	Concentrations										F value
	0.5% (owf)		1.0% (owf)		1.5% (owf) *		2.0% (owf)		2.5% (owf)		
	M	SD	M	SD	M	SD	M	SD	M	SD	
Weight loss (%)	0.99	0.40	1.73	0.28	2.99	0.40	3.06	0.43	3.13	0.89	16.63**
Moisture content (%)	2.26	0.46	2.52	0.23	3.06	0.47	3.26	0.70	3.39	0.46	8.10**
Bending length warp (cm)	1.1	0.03	0.99	0.04	0.82	0.06	0.81	0.08	0.79	0.06	25.22**
Bending length weft (cm)	0.93	0.05	0.90	0.05	0.67	0.05	0.64	0.05	0.63	0.02	43.00**
Strength loss warp (%)	0.38	0.004	0.39	0.005	0.41	0.005	1.28	0.008	1.95	0.005	66688.60**
Strength loss weft (%)	0.48	0.004	0.50	0.005	0.53	0.004	1.53	0.004	2.02	0.008	76061.05**
Crease recovery angle warp (°)	93	2.07	109	3.57	121	2.16	122	2.07	124	2.11	156.39**
Crease recovery angle weft (°)	108	3.80	117	2.30	129	0.89	132	1.94	134	1.51	118.66**

* Selected concentration, ** 1% level of significance

Treatment time

The F-values, as obtained from one-way analysis of variance, were found to be statistically significant at 1% level of significance. Hence, it was inferred that there was significant difference in the physical properties due to different treatment time. It was proved statistically by comparison of means at 1% level of significance that significant difference in the mean values of physical parameters occurred up to 45 minutes treatment time. Table 2 depicts that with an increase in treatment time from 25 to 45 minutes, a noticeable increase in weight loss was envisaged. The weight loss was 0.86%, 0.93%, 1.06%, 2.26% and 3.06% at 25, 30, 35, 40 and 45 minutes treatment time, respectively. However, it was observed that statistically insignificant difference in the mean values occurred up to 35 minutes treatment time, which indicated that variation in treatment time up to a certain extent does not produce significant weight losses. Varying treatment time beyond 35 minutes, however, produced significant weight loss on handloom cotton. Cellulase treatment breaks down the cellulose molecular chain from the terminal end or randomly causes weight losses, which increases the smoothness of the fabric.

Table 2 Mean Value, Standard Deviation and F-value of Physical Tests at Different Treatment Times of Acid Cellulase Enzyme on Handloom Cotton Fabric

Physical parameters	Treatment time										F value
	25 min		30 min		35 min		40 min		45 min*		
	M	SD	M	SD	M	SD	M	SD	M	SD	
Weight loss (%)	0.86	0.50	0.93	0.49	1.06	0.27	2.26	0.43	3.06	0.27	28.56**
Moisture content (%)	1.86	0.24	2.19	0.23	2.73	0.47	2.93	0.70	3.39	0.23	14.38**
Bending length warp (cm)	1.20	0.05	1.14	0.05	1.10	0.07	0.95	0.03	0.82	0.05	36.80**
Bending length weft (cm)	1.12	0.02	1.07	0.05	1.04	0.04	0.88	0.04	0.76	0.04	58.89**
Strength loss warp (%)	0.32	0.004	0.34	0.005	0.37	0.004	0.38	0.005	0.41	0.004	252.73**
Strength loss weft (%)	0.42	0.004	0.46	0.004	0.48	0.004	0.51	0.005	0.53	0.004	462.22**
Crease recovery angle warp (°)	87	2.40	90	2.77	105	2.20	115	2.01	125	1.95	161.29**
Crease recovery angle weft (°)	96	1.30	96	1.34	114	1.32	125	1.21	131	1.15	220.81**

* Selected treatment time, ** 1% level of significance

The moisture content was 1.86%, at 25 minutes, but it was significantly increased to 3.39% at treatment time of 45 minutes. The increase in moisture content could be possible because the surface of the cellulosic fibres is partially hydrolysed during enzymatic treatment and the weakened fibres get removed during the process. The bending length in both warp and weft direction decreased from 1.20 cm to 0.82 cm and 1.12 cm to 0.76 cm respectively on increasing the treatment time from 25 to 45 minutes. The maximum crease recovery angle in both warp (125°) and weft (131°) direction was found at 45 minutes.

Temperature

The F-value obtained at 1% level of significance confirmed that there was a significant difference in the physical parameters due to different temperature (see Table 3). It was proved statistically by comparison of means that significant difference in the mean values of all the physical parameters occurred up to three temperature levels, that is, up to 50°C. After increasing temperature beyond 50°C, no significant difference was shown in the mean values of the physical parameters.

Table 3 Mean Value, Standard Deviation and F-value of Physical Tests at Different Temperatures of Acid Cellulase Enzyme on Handloom Cotton Fabric

Physical parameters	Temperature										F value
	40 °C		45 °C		50 °C*		55 °C		60 °C		
	M	SD	M	SD	M	SD	M	SD	M	SD	
Weight loss (%)	1.19	0.60	2.13	0.37	3.06	0.27	3.13	0.18	3.26	0.14	30.24**
Moisture content (%)	1.26	0.46	2.13	0.23	3.19	0.23	3.39	0.46	3.93	1.18	33.73**
Bending length warp (cm)	1.19	0.04	1.11	0.04	0.88	0.04	0.85	0.03	0.83	0.05	68.80**
Bending length weft (cm)	1.14	0.04	1.10	0.03	0.77	0.02	0.75	0.03	0.73	0.05	125.66**
Strength loss warp (%)	0.38	0.004	0.41	0.004	0.44	0.004	1.05	0.004	1.53	0.004	65777.93**
Strength loss weft (%)	0.49	0.004	0.51	0.005	0.54	0.004	1.14	0.004	1.83	0.004	78616.45**
Crease recovery angle warp (°)	87	1.67	94	1.62	119	1.22	120	1.25	121	1.19	66.00**
Crease recovery angle weft (°)	95	1.22	101	1.27	128	1.13	129	1.24	131	1.32	244.63**

* Selected temperature, ** 1% level of significance

It may be seen from the Table 3 that there is maximum increase in weight loss (3.06%) at 50°C due to the action of the acid enzyme. By increasing the temperature beyond 50°C less increase in weight loss was found. It has been observed that the enzymatic treatment caused minimum tensile strength loss in both warp (0.38% - 0.44%) and weft (0.49% - 0.54%) direction. Weight loss is basically due to the surface hair removal and surface etching which subsequently reduces the tensile strength. Significant increase in moisture content, that is, from 1.26% to 3.19%, was found with increase in temperature from 40°C to 50°C.

The maximum effectiveness in the reduction of bending length in warp (1.19% - 0.88%) and weft (1.14% - 0.77%) direction was observed by raising the temperature from 40°C to 50°C. The significant increase in crease recovery angle in both warp and weft direction was up to 50°C, after which increase in temperature showed slight increase in crease recovery angle which was found to be statistically insignificant. The crease recovery angle at 50°C in warp and weft direction was 119° and 128°, respectively. The reduction in bending length and improvement in softness and crease recovery angle may be attributed to the improvement in softness and feel of the fabric. Therefore, 50°C temperature for acid cellulase enzymatic treatment was considered as optimum on the basis of the above physical properties studied.

Conclusion

Cellulase enzymes are important tools in the textile industry for processing cellulose fibres. They provide an economical and ecological way to treat cotton fabrics. Thus, it was concluded from the present study that the positive effects obtained with acid cellulase enzymes, that is, moisture absorption, bending length and crease recovery angle, were maximised by using the optimised enzymatic process variables. Nowadays, the use of cellulases in the pre-treatment process has found much broader acceptance as the effect of the treatment is long lasting. The colour of the dyed fabric also became brighter with more colour yield. The enzymatic pre-treatment of the textiles is not aggressive to fibres or environment. The “clean chemistry” approach is an advantage in comparison to the powerful alkalies, acids, oxidisers and reducers needed in traditional processes tending to attack the textile material as well as causing considerable contamination in the environment.

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Acceptance of home-prepared soy dishes in low-income rural Qwa-Qwa communities

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Abstract

Protein-energy malnutrition was identified in three low-income rural communities in South Africa. Strategies implemented included a home gardening programme to provide soy and vegetables. However, these households were unfamiliar with household consumption of soy. To support alleviation of PEM in a sustainable manner, ten recipes containing home-cultivated soy were developed within specific criteria and assessed using a five-point hedonic rating scale to ensure sensory and cultural acceptance at household level. The acceptance level for sensory attributes and utilisation (acceptance by all household members, eating soy as part of a meal, willingness to prepare dishes at home, and knowledge/skills regarding preparation of dishes), was high, with no statistically significant differences between groups ($p < 0.05$), indicating support for proceeding with the project. Subsequently, a survey determined recipe format preferences and measuring practices as a basis for food preparation training and formulation of a recipe book (separate article). A re-assessment will be conducted in a year to determine sustainability over time and the effect on PEM levels.

Introduction

Background

Poverty, and per implication the impact of increasing food prices, hit the poorest people in developing countries the hardest (US Agency for International Development (USAID), 2009). In South Africa an increasing lack of household food security is experienced, especially in rural areas (Koch, 2011; Food and Agricultural Organization, 2011). Because of the escalating constraints experienced by consumers at the lowest levels of income, it is difficult for them to afford a healthy diet within the normal range of food choice (Oldewage-Theron & Egal, 2010; Duvenage, 2010).

Context of the main study

Under-nutrition, including protein-energy malnutrition (PEM), was identified among children (Oldewage-Theron & Egal, 2010) and women (Oldewage-Theron, Duvenage, & Egal, 2012) in three low-income rural Qwa-Qwa communities in the Free State province of South Africa. In spite of the fact that 73% of this population (Thabo Mofutsanyane district) was living below the poverty line for South Africa (Punt et al., 2005), the clinical signs for PEM, namely oedema, diarrhoea and irritability, were not pronounced. Successful results for the

fortification of food with soybeans have been reported in the treatment for PEM (Obatolu & Cole, 1999).

Based on this evidence, a project entitled “Improving household food security in Qwa-Qwa” was launched to address household food insecurity and the resultant malnutrition in children and their caregivers. Strategies implemented to combat nutritional shortfalls and the consequences there-of included among others, the development and implementation of a home gardening programme. The aim was the sustainable provisioning of soy as source of affordable protein and energy that could be self-cultivated (together with other produce) by these low-income households.

However, it was found that home-produced raw whole soy was not habitually utilised by these households in food preparation as the individuals were unfamiliar with this foodstuff as a commodity for human consumption. The development and acceptance testing of recipes containing home-produced soy, that will be compatible with the household circumstances of this target population (as described by Oldewage-Theron et al., 2012), became a necessity.

Context of this article

This article focuses on the development and the consumer acceptance of ten dishes containing home-cultivated soy. The household constraints experienced by the three participating low-income rural Qwa-Qwa communities guided the criteria for recipe formulation.

Despite willingness to try new foods, low-income households may hesitate to spend money on foods or ingredients when they do not know how to prepare them, or whether they will like and eat them (Brown & Marczak as quoted in May, 2008). These factors may compromise the preparation and consumption of soy-containing dishes at household level.

In the general food environment, several considerations play a role during value negotiations in food choices, involving sensory perceptions, monetary considerations, convenience, health and nutrition, managing of relationships and perceptions of quality (Furst, Connors, Bisogni, Sobal, & Falk, 1996), which are unique for every household. Rational thought and memories, regarding satisfaction (functional benefit) and enjoyment (hedonic expectation and experience), come into play. Consumers therefore selectively use food product information to meet needs related to specific beliefs and predispositions (Lundahl, 2006). Accordingly, the acceptance or rejection of a food product is determined by the compatibility of the attributes of a food product with the needs of the specific target group (Earle, Earle, & Anderson, 2001; Grunert, Brehdahl, & Brunsø, 2004; Clark, 2008), whether conscious or automatic, habitual and subconscious (Furst et al., 1996).

A food product consists of a combination of attributes, including appearance, taste and texture (Green & Srinivasan, 1987). It is also known that consumer preferences, and therefore acceptance, differ between groups (Grunert et al., 2004), which necessitates acceptance testing of a target consumer group.

For low-income consumers, food choice (and therefore acceptance) is described by a mix of product attributes including both budget and non-price preferences (Hughes, 2002; Duvenage, 2010). Household composition, including household size, the presence or absence of a male partner and children, and the availability of additional income (Dobson, Beardsworth, Keil, & Walker, 1994) influences purchasing. Initial purchases (and food products prepared) need to meet the preferences of all household members to prevent wastage (Dobson et al., 1994) as no repurchasing can take place. It thus follows that acceptance of a food product is of high importance to promote consumption by a specific target consumer group.

The inclusion of proteins, such as soy, in a food affects sensory properties. Such an inclusion in the formulation of a recipe could bind flavours and off-flavours during the cooking process and release reactants that may produce flavours (Jideani, 2011) that could influence acceptability.

Consumer sensory evaluation “measures how much humans (current and potential users/customers of a product) like/dislike, prefer, and or accept/reject a product with a view of predicting sales/use” (De Kock & Schönfeldt, 1996, p. 1). The determining of overall liking or preference for a product or products, as well as the liking or preference for specific sensory attributes (e.g., appearance, texture) thereof, are examples of such procedures. These findings are applicable to the specific target group involved.

Rating scales are often utilised as a tool to reflect the perceptions or opinions of a target consumer group regarding the acceptability, liking or dislike of specific products or specific attributes of products, for example, liking of the taste of a dish containing soy (Guinard, 2001). The use of a five-point hedonic facial scale was found to deliver credible results when determining the acceptability of soy products by consumers with a low level of literacy. However, assistance was provided during assessment (De Bruin & Minnaar, 1994).

Methods

Ethics

The study protocol was formulated to meet the criteria stipulated by the South African Medical Research Council (MRC) and the Declaration of Helsinki for research on human beings (MRC, 1993; Office of Human Subjects Research, 2004). Approval was obtained from the University of the Witwatersrand Medical Ethics Committee for Research on Human Beings (M080931). Informed consent was obtained from all participating respondents. At all times the life, health, privacy and dignity of all human subjects was protected. Accordingly, only foodstuffs manufactured for human consumption were incorporated in dishes prepared for sensory evaluation, and a reasonable likelihood existed that participating households stood to benefit from the results of the research. The attention of respondents was drawn to the fact that persons with a soy allergy should not participate in this initiative.

Study population and sampling

Current or potential product users are selected for affective (preferences, acceptance, and/or opinions) testing (Sensory Research Division, 2005). Accordingly, one representative per household (from the communities participating in the main study), either a male or female adult, were included as part of the current study. On average the literacy level in these communities was quite high (53% completed secondary school), but diverse, as 12% had received no schooling. Approximately half of these low-income households were single-headed (51%), and/or female headed (52%). Most households (69%) also had no or only one contributor to household income (Oldewage-Theron et al 2012).

The criteria applied for purposive sampling in the main study (Babbie & Mouton, 2002) stipulated permanent residence in rural Qwa-Qwa, belonging to one of three specific communities, having children in the household, and participation in the home gardening initiative (implying household availability of soy) as well as having signed the informed consent forms.

In addition, opportunity sampling was applied during fieldwork for acceptance testing, including only household representatives who attended the different sessions. Over the different groups (Thibela n = 50 to 62, Dinkweng n = 15 to 27, Batlokwa n = 10 to 12), each dish was assessed by 75 to 101 respondents (Gacula & Rutenbeck, 2006).

Permission to arrange a contact occasion was obtained from the respective leader/chief of a community prior to any visit. Participants from the different communities were informed of the date and aim of a visit at least five days in advance. The respective local community halls were utilised for such occasions.

Study design

An experimental study design was followed during assessment for acceptance, with repetition in the three different communities (groups). Owing to the scope of the study and the fieldwork conditions, randomisation in the evaluation sequence within groups was not possible, but a randomised block design was applied between groups (Porkess, 2005). Although bias in results might have been incorporated, it is trusted that the sample size of the study (n = 75 to 101) and randomisation between groups have counteracted the problem (Babbie & Mouton, 2002).

Measurement tool

A limited five-point hedonic rating scale, ranging from “like a lot” to “dislike a lot” as illustrated by facial expressions, was utilised for acceptance testing (De Bruin & Minnaar, 1994, p. 25). This tool facilitated the reporting of the level of liking for each of the attributes for each of the dishes by each respondent. The product attributes assessed for acceptance included appearance, taste and texture, and the acceptance for household use included expected acceptance of the soy-containing dishes by all household members, willingness to consume these dishes as part of a meal, and willingness to prepare these dishes at home. The latter was complemented with the optional opportunity to report explanatory short comments related to the availability of ingredients, knowledge/skill to prepare the respective dishes,

preparation time, other ingredients that can be added for the respondent to like the respective dishes, and other (open option).

Procedures

A two-step approach was followed:

During the early months of 2011 a series of ten recipes containing soy was developed. Abiding to the constraints experienced by the participating households (Oldewage-Theron et al., 2012), the criteria for recipe formulation, using existing recipes as points of departure, included the following:

1. containing an equivalent of at least a half cup of dry soybeans per dish (to provide the equivalent of at least 20g soy per person per serving)
2. providing serving sizes suitable for a family of six (average household size of five persons)
3. affordable (as cheap as possible but with taste in mind, and cooking times as short as possible)
4. easy to prepare (level of food preparation expertise questionable as limited skills were needed for preparation of foods habitually consumed)
5. compatible with household circumstances (including habitual availability of ingredients and soy from the home gardens, utensils and facilities e.g. no ovens for baking, and general practicality).

These recipes were formulated and prepared in cooking laboratory conditions and adjusted to correct formulation problems until reasonable results were obtained, while satisfying the stipulated recipe formulation criteria. Recipes for basic dishes suitable for everyday habitual consumption (e.g., bread and milk), and main dishes to expand fish and meat utilisation, were developed. Additional soy-containing recipes included vegetables, dessert, accompaniments and snacks. These dishes were then assessed for acceptance by the target consumers.

Respondents were first familiarised with the procedure for assessment of consumer acceptance. A training session to explain and practise procedures was presented in each of the communities.

Each respondent was provided with a copy of the assessment sheet, indicating the facial expressions according to the five-point rating scale for the different food product attributes to be assessed. The meaning of the faces as reporting levels of liking was explained to the group. Then a bottle of water and a food test sample was issued to each respondent. Under guidance of the researcher and the field workers, the procedure for mouth rinsing before every assessment was demonstrated to and practised by the respondents (Heymann, 1995). A similar approach was followed for the assessment procedure of the food sample, including directions for chewing and assessment for acceptance. Respondents could ask questions throughout the process in order to clarify all issues. No training was conducted regarding the

meaning of terminology as responses have to be embedded within the context of the respondents' own understanding.

In order to familiarise participants with the inclusion of soy in home-prepared dishes and the knowledge/skills needed to prepare them, the preparation of the specific dishes was demonstrated prior to, but on the same day that, acceptance assessment for these dishes took place. This procedure also provided respondents with background information to form perceptions related to budget and non-price influences, as linked to the realities of their own lives that would guide their acceptance of the respective soy-containing dishes at household level (Furst et al., 1996; Hughes, 2002).

Consumer testing took place over three separate occasions in each of the communities. On no occasion more than four dishes were assessed in a day. At all times suitable time lapses were allowed between assessments for resting and mouth rinsing to prevent confusion of flavours and fatigue. To further enhance validity, a one-on-one interviewing technique was applied. Trained and experienced fieldworkers fluent in South Sotho assisted (but not influenced) individual respondents to record their perceptions and complete the assessment sheets on their behalf.

Food samples were served in white containers to limit bias, while serving sizes were displayed on dinner plates (or in clear glasses where applicable). All respondents received approximately equal-sized samples of a specific dish.

Because electricity was unavailable on the days that assessment for acceptance took place, food samples were served at ambient temperature. However unfortunate, this was not a situation with which these households were unfamiliar. Low-income consumers often prepare food only once a day and then consume what was left over, at ambient temperature, as a second meal at a later stage (e.g., left-over maize meal porridge is often consumed cold the next morning). The influence of the lack of electricity was a constant in the study, and the impact on the validity of the study is expected to be minimal.

Statistical analysis

Analysis included both quantitative and qualitative analyses. Successive numerical values (1 to 5) were assigned to the respective points on the five-point hedonic facial scale. Using Excel 2010, frequency tables were compiled to guide statistical interpretation. For each dish, the two ratings that received the highest number of endorsements were reported as representative of the level of consumer acceptance for that dish. Chi square (χ^2) values were calculated for all dishes versus sensory attributes (for the seven complete data sets) to report statistical correlation between dish and level of acceptance, using the Statistical Package for Social Sciences (SPSS), version 19.0. The level of acceptance (average \pm SD) was determined and the respective dishes were ranked accordingly.

Due to a stringent budget, complete data sets could be generated for only seven dishes over the three communities. For three dishes the assessment could be completed only for the largest community, to at least provide an idea of the acceptance level to be expected. For the incomplete data sets, results were extrapolated from the derived findings.

The explanatory short comments were captured and organised according to key aspects to allow quantitative analysis based on frequency of similar responses and to indicate the comments most frequently reported.

Results and discussion

Once the amount of soy to be included in each of the recipes was calculated, theoretical formulation, for which only general derived guidelines are reported here due to the individual nature of each recipe, could proceed. With completion of the laboratory testing, adjustment, and re-testing as needed, the assessment for consumer acceptance could be conducted and reported.

Amount of soy to be included

Soy is the only plant source of complete protein (United Soybean Board, 2011) currently utilised for human consumption. In order to benefit from soy consumption, an amount of at least 15 grams (g) of soy protein is recommended per person for daily consumption (Pelembé, 2009, p. 15). This amount represents approximately 60% of the amount recommended for full heart and other health benefits (Food and Drug Administration, 2009).

As mature soybeans contain approximately 38% protein (United Soybean Board, 2006, p. 9), at least 40g of soy needs to be consumed per person per day. It follows that the cooked equivalent of at least 240g (one cup) of raw dry soybeans (two cups of soaked soybeans or soaked minced soybeans) needs to be consumed per day by a household of six people, which could be distributed over separate dishes. So an intake of 15g protein (complete) and 627kJ per person per day could be realised from the soy alone (Wolmarans, Danster, Dalton, Rossouw, & Schönfeldt, 2010, section 4-5). This would constitute a meaningful contribution to the average daily nutritional intake of these households.

For the purpose of standardisation and workability the equivalent of 120g (half a cup) of dry soybeans was included in each recipe, necessitating the inclusion of two soy-containing dishes in the daily menu of a household of six members.

Formulation of recipes

As no clear-cut guidelines existed for the inclusion of soy or exchange of ingredients for that purpose, a trial-and-error procedure was followed, relying on food science principles as far as possible, and learning from experience.

As a point of departure, an existing recipe was theoretically adjusted for six servings. Approximately half of the dry starch in the recipe but not more than one cup (if applicable) was replaced by one cup of soaked minced soybeans. Due to this added bulk, the raising agent needed to be increased, additional liquid was necessary to combat dryness and problems with texture density in the final product, and the fat/oil in the original recipe needed to be diminished to balance the high oil content from the added soy. It was often necessary to limit the number of eggs (if applicable) to prevent a rubber-like texture. Adjustment to ensure balance with the rest of the ingredients received attention at this stage, with special focus on flavouring, salt and meeting the criteria for recipe formulation

(as stipulated in the procedures). If a cooking method used in a basic recipe was changed, for example, if bread needed to be steamed in a tin (often in a pot over a fire or on a one-plate counter stove) because no baking facilities was available, additional attention was allocated to texture.

Critical appraisal directed all adjustments for re-testing. Overall, adjustment for texture, taste, and meeting recipe criteria constituted the major challenges during recipe development. Input by traditional South Sotho speakers, who had first-hand knowledge and experience of living conditions of the target population, proved to be valuable.

Consumer acceptance for appearance, taste and texture

The pleasure, or hedonic, dimensions of food, especially taste but also appearance, are generally recognised as major influences in the quality perception of a food (Brunsø, Fjord, & Grunert, 2002). Appearance attracts consumer attention and relates to the visual properties of a food product. Basic attributes such as colour, visual shape and texture, and perceived flavour come into play (Imram, 1999; Lawless & Heymann, 1998). In order to ensure simplicity, such a distinction was not implemented in this study. However, these factors would be perceived and assessed subconsciously.

Table 1 indicates a very high level of acceptance by all groups for the appearance of the seven soy-containing dishes for which full data sets were completed. It can therefore be inferred that the appearance of these dishes will not hinder their inclusion at household level. The overall X^2 indicated no difference ($p > 0.05$) between groups for these recipes.

Taste generally exerts a major influence on food behaviour (European Food Information Council (EUFIC), 2005; Bogue, Delahunty, Henry, & Murray, 1999) and is not easily compromised for health benefits (Gilbert, 2004). But taste preference is based on experience (Harker, 2001; EUFIC, 2005). This highlights the importance of taste in the choice of dishes and flavourings during recipe development.

The acceptance of taste is crucial to sustain usage, especially when the respondents' own efforts will be involved in the production and preparation of the commodity. Approximately 75% or more of the respondents in all groups indicated a very high level of acceptance of taste for the assessed dishes (Table 1). No difference between groups was reported ($p > 0.05$).

However, the soy milk drink was the only dish with an unmasked soy taste as only a little sweetening was added. In order to explore the possible effect of familiarity due to exposure over time, a re-test was conducted in the largest community after completion of the series. A major change was reported in the acceptance level of the product (see values indicated in brackets) (Table 1). The level of sensory acceptance seemed to have been influenced by increased familiarity, reflected in the development of a "learned taste" (Clark, 2008, p. 642).

Table 1 Percentage of participants who indicated a high level of acceptance of the soy dishes.

	Appearance			Taste			Texture		
	Thibela ¹ %	Dinkweng ² %	Batlokwa ³ %	Thibela ¹ %	Dinkweng ² %	Batlokwa ³ %	Thibela ¹ %	Dinkweng ² %	Batlokwa ³ %
Soy-containing dishes									
Soy bread	100	100	100	95	100	100	91	100	100
Tasty soy meatballs with curry sauce	97	100	100	97	88	100	98	100	100
Fish cakes with spicy relish	97	100	100	97	88	100	98	92	90
Green bean soy fritters	98	100	100	98	100	100	92	100	100
Malva soy pudding	100	87	100	100	87	100	100	87	100
Soy milk drink	45 (4)	81	100	45 (88)	75	100	61 (82)	69	91
Healthy crumpets	100	100	100	100	100	100	98	100	100
Cocoa soy balls	100			100			98		
Spiced pumpkin with soy	83			81			79		
Bean soup with dumplings	76			75			80		

¹Thibela (n = from 50 to 62), ²Dinkweng (n = from 15 to 27), ³Batlokwa (n = from 10 to 12).

It could be reasoned that the taste of all assessed dishes (including the soy milk drink) was well accepted, which should facilitate the inclusion of all assessed dishes in the daily menus of these households.

Consumers normally have clear expectations of product texture and any changes from what memory indicates as expected are noted immediately and are regarded as a defect in quality (Mojet & Köster, 2005). Texture is also perceived as more pronounced in mild-flavoured products or when expectations are not met (Tuorila, 2007).

In spite of the challenges faced by the researchers, a quite high overall level of texture acceptance was indicated for the different dishes in each group, and there was no significant difference in level of acceptance between groups ($p > 0.05$) (Table 1). From the indicated findings, it is clear that the texture of the developed dishes was not likely to jeopardise the inclusion of these dishes in the daily menu of the target population.

Consumer acceptance for household use of soy-containing dishes

Target consumers' acceptance of the use of the soy-containing dishes, as related to the perceived needs and beliefs (e.g., financial constraints, culture) of their own households (whether conscious or unconscious), was reported in terms of expected acceptance by all household members, willingness to consume the dishes as part of a meal, and willingness to

prepare these dishes at home (Earle et al., 2001; Grunert et al., 2004). If food product acceptance by all household members could be ensured, the risk of non-acceptance and subsequent wastage (financially and health-wise) could be counter-acted (Dobson et al., 1994).

From the results in Table 2 it is clear that respondents from all groups expected a high level of product acceptance of the assessed dishes from the members of their respective households. This finding supported the initiative to include soy in dishes for household preparation and consumption. If any cultural constraints existed against any of the ingredients or dishes, it would have been noted here.

Most households in these communities consumed either two (30%) or three (63%) meals per day (Oldewage-Theron et al., 2012). The overall X2 showed no difference between the groups (p >0.05), indicating a very high level of willingness by all groups to consume the dishes containing soy as part of a meal (Table 2), confirming the importance of daily meals as a vehicle for the inclusion of soy as part of the dietary intake for these households.

Likewise, all groups indicated an enthusiastically high degree of willingness to try the preparation of the assessed soy-containing dishes at home (Table 2).

Table 2 Percentage of participants who indicated high levels of acceptance on three domains of use.

	Expected acceptance			Part of a meal			Preparation at home		
	Thibela ¹ %	Dinkweng ² %	Batlokwa ³ %	Thibela ¹ %	Dinkweng ² %	Batlokwa ³ %	Thibela ¹ %	Dinkweng ² %	Batlokwa ³ %
Soy-containing dishes									
Soy bread	93	100	100	100	100	100	96	100	100
Tasty soy meatballs with curry sauce	90	96	91	97	100	100	95	96	91
Fish cakes with spicy relish	90	100	100	97	100	100	95	100	100
Green bean soy fritters	94	100	100	98	100	91	98	100	91
Malva soy pudding	100	87	100	98	100	100	100	100	100
Soy milk drink	82	69	100	100	100	100	100	100	100
Healthy crumpets	100	100	100	98	100	100	95	100	90
Cocoa soy balls	100			100			72		
Spiced pumpkin with soy	79			98			88		
Bean soup with dumplings	83			100			87		

¹ Thibela (n = from 50 to 62), ² Dinkweng (n = from 15 to 27), ³ Batlokwa (n = from 10 to 12)

Dishes not assessed by all groups

No statistical difference existed between the three communities regarding the acceptance of the appearance, taste and texture attributes, and acceptance for use (expected acceptance by household members, inclusion as part of a meal, and willingness to try the preparation of the dishes at home). The acceptance of the three soy-containing dishes not assessed for consumer acceptance by two of the groups could therefore be extrapolated from the results reported for the larger group, suggesting acceptance by the other two groups.

Overall acceptance level

Over the different groups, average acceptance levels ranging between 99 \pm 2% and 91 \pm 11% were reported for the seven dishes for which full assessments were conducted. These figures are indicative of a high overall acceptance level, with relatively little difference between the respective dishes. According to rank order, the healthy crumpets were indicated as the best accepted dish (99 \pm 2%), followed by soy bread (99 \pm 3%), green bean soy fritters (98 \pm 3%), fish cakes with spicy relish (97 \pm 4%), malva soy pudding (97 \pm 6%), soy meatballs with curry sauce (96 \pm 4%), and the soy milk drink (91 \pm 11%).

Explanatory short comments

The short comments were of a general nature, mostly regarding the amount of salt and/or pepper in the respective dishes. As these aspects could be self-adjusted according to taste during household preparation, no re-adjustment and subsequent re-assessment of any recipe was required. A few other comments were related to the household availability of ingredients, mostly for ingredients such as cocoa that were not used on a daily basis, and appreciation for the short preparation time once the soy beans were soaked and minced/grinded for inclusion in the recipe. However, it became clear that various degrees of competency were perceived for knowledge/skills in the household preparation of the different soy-containing dishes.

Knowledge/skills for preparation of the soy-containing dishes

Familiarity with a product/commodity and a feeling of competence are important in food preparation. Even if there is a willingness to try a new food, a lack of food preparation skills can hinder change, especially if money needs to be spent (Brown & Marczak as quoted in May, 2008).

From Table 3 it is clear that a high level of knowledge/skills were perceived for the household preparation of green bean soy fritters and the malva soy pudding. When coupled with the results reported for acceptance of the sensory attributes (Table 1) and household use (Table 2), the inclusion of these two dishes on the menu of these households seemed assured.

It was of concern that a low rate of competency was perceived by the respondents for the preparation of the healthy crumpets and the soy bread (Table 3). The acceptance for appearance, taste and texture was reported as very high for both dishes (ranked respectively as best and second best accepted), which indicated possibilities for use of these dishes as supportive starch staple foods that could be consumed on a daily basis as alternative for, or in

addition to, the habitual maize meal consumption by these communities. The crumpets or soy bread could also be used for inclusion in lunch boxes for children going to school.

However, a very high level of competence was perceived for the preparation of the soy milk drink (Table 3). This versatile product, which consisted of a slightly sweetened cooked extract prepared from minced/grinded soaked soy beans and water, with a typical soy-like taste, could be used as a drink (as is or flavoured, for example, with seasonal fruit from the respondents own gardens), in tea or coffee (learned taste), and in the preparation of food (e.g., when preparing other soy-containing dishes).

With the high acceptance rate indicated for the assessed sensory attributes by all three communities (Table 1), the potential contribution by this dish to the daily intake of soy should not be under-estimated.

Table 3 Percentage of participants who indicated that they possessed the knowledge and skills required for preparation of the soy dishes

Knowledge/skills perceived for preparation			
Soy-containing dishes	Thibela ¹ %	Dinkweng ² %	Batlokwa ³ %
Soy bread	42	48	42
Tasty soy meatballs with curry sauce	21	58	91
Fish cakes with spicy relish	46	100	100
Green bean soy fritters	70	100	100
Malva soy pudding	77	100	100
Soy milk drink	100	100	91
Healthy crumpets	35	100	90
Cocoa soy balls	43		
Spiced pumpkin with soy	38		
Bean soup with dumplings	13		

¹Thibela (n=50 to 62), ²Dinkweng (n=15 to 27), ³Batlokwa (n=10 to 12)

Conclusion

A high level of acceptance was reported for the respective soy-containing dishes. If consumed on a daily basis in the quantities recommended, a significant contribution could be delivered to the protein and energy intake for which a shortfall existed in the dietary intakes of the caregivers and the children in these low-income rural communities.

The barrier against the possible inclusion of most of these recipes for home-preparation by the communities were therefore not constituted by a lack of acceptance for the sensory attributes of the dishes or the household use thereof, but by a lack of knowledge/skills in the preparation of the dishes.

Knowledge/skills in food preparation represent variables that are difficult to measure but, if not addressed, could possibly compromise the long-term goal of the main study to improve household food security in Qwa-Qwa. Further action is recommended in this regard.

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Biography

Dr Duvenage freelances as researcher, specialising in community-involved affordable food product formulation to meet nutrient deficiency and food product acceptance needs of low-income consumers. She has presented at conferences, supervised MTech research, authored/co-authored publications and is membership officer for the South African Association of Family Ecology and Consumer Science.

Professor Oldewage-Theron (PhD Dietetics) is a registered dietician and Director of the Research Centre of Sustainable Livelihoods (CSL). Her focus is on addressing household food insecurity and malnutrition, specifically micronutrient deficiencies and nutrition education, in low-income communities. She manages, markets and seeks funding for CSL. She has successfully supervised six DTech and 17 MTech students and is author/co-author of 35 full-length peer-reviewed papers, mostly in international journals. She has presented at various national and international conferences and co-authored 35 abstracts and six articles published as part of conference proceedings. She is the President of the African Nutrition Society (ANS).

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Health Status and Household Saving Behaviour

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Aim

The purpose of this study is to investigate the relationship between health status and household saving behaviours. According to Smith (1999), life-cycle models are a natural place to begin exploring how health is related to family savings decisions, but health has not generally been an integral part of theoretical and empirical work on motivations to save. Thus, we use a life-cycle saving framework to explore the relationship between self-reported health status and the act of saving.

Framework

The life-cycle framework is the standard way that economists think about the intertemporal allocation of money, time, and effort (Browning & Crossley, 2001). The life-cycle framework provides a model of saving over the lifetime (Modigliani and Brumberg, 1954), and the textbook version of the life-cycle model is very simple and intuitively attractive (Attanasio & Banks, 2001). Individuals have a hump-shaped income profile over the lifetime, with income rising with experience and tenure until retirement, after which there is a dramatic drop in income. Although income changes over the lifetime, consumption is kept either flat or slightly increasing or decreasing, and is dependent on the relationship between the discount factor and the interest rate.

Life-cycle theory aids in thinking about important policy questions such as how societies should provide for the increasing number of elderly citizens (Deaton, 2005). Households at different life-cycle stages, with different economic and demographic characteristics, should be motivated to save or dissave depending on their practical needs and long-term financial plans (Chang, 1994). In its most general form, the life-cycle framework simply asserts that individuals make sequential decisions to achieve a coherent goal, using currently available information as best they can (Browning & Crossley, 2001). In this paper we investigate how the saving decisions of households are affected by health using the life-cycle model of saving as the framework.

Literature review

An individual's health status affects his or her saving behaviour (Davies, 1981; Palumbo, 1999) and Kennickell and Lusardi (2005) argued the importance of including health risks in studies on saving, but relatively little is known about the relationship between health and general saving behaviours (Smith, 1999). Health has been shown to affect total wealth accumulation (Smith, 1995; Poterba, Venti, & Wise, 2000; Wu, 2003), with those in excellent health holding substantially higher levels of wealth than those in poor health (Smith, 1999). Many researchers have focused on the effect of socioeconomic status on health, but researchers are

only recently beginning to investigate the effect of health on economic resources (Smith, 1999) as well as the linkages between labour supply, health, and consumption (Browning & Crossley, 2001).

Although researchers have shown that health is negatively related to economic well-being, and wealth in particular, there is limited research focusing on the relationship between an individual's health status and the act of saving (Smith, 1999). The relationship between health and economic resources is very complex, and although many medical scientists have argued that variation in socioeconomic status produces health disparities, there is an increasing debate about why low economic status leads to poor health, and these studies have had limited input from economists (Smith, 1999). Thus, economists have more recently begun to investigate the impact of poor health on economic resources, as there are many ways that health can affect economic well-being. The connection between wealth and health has been inadequately explored partly because of a lack of data combining good information on health and economic variables. Though it has limited variables on health, the Survey of Consumer Finances (SCF) offers reliable data on a broad array of financial measures in addition to several variables on health status, and can be used to explore the relationship between health and saving.

There are several ways health can affect economic well-being. Poor health can restrict a family's ability to earn income or accumulate assets by reducing time in the labour market or increasing medical expenses (Smith, 1999). However, the prospect of high medical expenses is the main way in which health risks have been incorporated into life-cycle models (Lillard & Weiss, 1996; Palumbo, 1998; Smith, 1999). According to Smith (1999), out-of-pocket medical costs are modest for the average person and costs are relatively insensitive to the onset of even serious illnesses. The small probability of a very expensive outcome related to health care indicates that attitudes toward risk and uncertainty could be central to understanding saving behaviour (Smith, 1999).

Health could also affect savings by reducing work in the labour force by the person who is ill; however, other members of the household may work more to compensate for the reduction in income (Smith, 1999). In addition to income changes, health status is likely to affect the marginal utility of consumption (Browning & Crossley, 2001; Smith, 1999). If the marginal utility of consumption declines with poor health, individuals may wish to consume more when they are healthy than during the years they are ill. Households may also adjust to a decline in health by reducing financial transfers to their heirs (Smith, 1999).

Researchers have shown that health may be an important determinant of wealth and savings among the elderly (Diamond & Hausman, 1984; Kotlikoff, 1989; Smith, 1999). Diamond and Hausman (1984) found a negative relationship between poor health and retirement saving. Poor health has also been shown to have a negative relationship with general saving in models focused on uncertainty, saving motives, and horizon (Fisher, 2010b; Fisher & Montalto, 2010), and Fisher (2010a) found that poor health decreased the likelihood of short-term saving for women, but not men.

Age, marital status, and number of household members, all of which are classified as life-cycle variables in the present study, have been shown in the literature to have a relationship with saving behaviours. According to Bosworth, Burtless, and Sabelhaus (1991), saving rates increase until an individual reaches his or her mid to late 60s, after which the saving rate drops. Married couples without children have the highest saving rates in the population (Avery & Kennickell, 1991; Bosworth *et al.*, 1991). Larger household size is associated with a decrease in saving.

According to Yuh and Hanna (2010), having income higher or lower than normal over the previous year affects saving behaviours. Studies have shown that risk tolerance also has a strong relationship with saving behaviours (Fisher, 2010a), as does income uncertainty (not having a good idea of income in the next year; Fisher, 2010b). According to Lusardi (1998), an individual's life expectancy (age that the respondent expects to live to) accounts for the wide variation of wealth among households, and thus may apply in the present context. Wealth, income, planning horizon, race, and education are shown in the literature to have a relationship with saving. Demographics and household wealth are commonly used determinants of saving in household-level empirical studies (Aghevli, Boughton, Montiel, Villanueva, & Woglom, 1990; Masson, Bayoumi, & Samiei, 1995).

Methods

Sample

The data used in this study come from the 2007 wave of the USA Survey of Consumer Finances (SCF), a nationally representative data set that provides information on household assets and liabilities as well as self-reported financial behaviours. Households with a respondent and/or spouse who is retired and/or 65 years or older are omitted from the sample because their saving behaviours have been shown to differ from those of non-retired households and those 65 and older have access to Medicare, which may also affect their saving and consumption behaviours. The total sample size in the present study is 3,490 households.

Logistic regression is used to estimate the empirical model. When imputation techniques are used to fill in missing data, such as in the SCF, extra variability occurs in the data (Montalto and Sung 1996). This variability can be incorporated into empirical estimates by using "repeated-imputation inference" (RII) techniques, which estimate this variability and lead to more valid inference and tests of significance. RII techniques are recommended in order to produce estimates that incorporate variability in the data due to missing values (Montalto & Sung, 1996; Rubin, 1987). In this study, RII techniques are used for the logistic regression analyses. The coefficients in the logistic regression specifications are estimated based on the average value of other attributes.

Empirical Model

We use a measure of saving as the dependent variable, with the dichotomous dependent variable (saver) taking a value of 1 if the household: (a) saves regularly by setting aside a certain amount each month or saving the income of one spouse and (b) had spending that was less than income over the previous year. The explanatory variables include life-cycle

variables, health and health insurance variables, risk and uncertainty variables, a bequest motive variable, and socioeconomic controls.

The life-cycle variables include age, age-squared, marital status, and number of household members. The risk and uncertainty variables include having income higher or lower than normal over the previous year, risk tolerance, and income uncertainty (not having a good idea of income in the next year). The health and health insurance variables include health status (good to excellent - reference category, fair, and poor), smoking (yes/no), life expectancy (age that the respondent expects to live to), and health insurance status (no health insurance - reference category, both respondent and spouse (if present) have private health insurance, and both respondent and spouse (if present) have government health insurance). The bequest motive is a dummy variable based on whether the household lists leaving a bequest as one of their most important reasons for saving and spending. Socioeconomic controls include wealth, income, planning horizon, race, and education.

Results

Descriptive Statistics

About 34% of the overall sample are savers, with significantly different proportions of savers in the poor health, fair health, and good to excellent health groups. Only about 11% of households with a respondent and/or spouse in poor health are savers, as compared with 24% of those in fair health and 38% of those in good to excellent health. About 73% of households in the sample have a respondent and spouse or partner (if present) in good to excellent health, while 21% of households have a respondent and/or spouse or partner in fair health and about 6% are in poor health.

About 14% of the good to excellent health group do not have health insurance as compared with 21% of the fair health group and 19% of the poor health group. About 44% of the poor health group have government health insurance (e.g., Medicare, Medicaid, VA) while only 11% of the good to excellent health group have government health insurance. Almost half of the poor health group smokes (respondent and/or spouse or partner, if present) as compared with about one quarter of the good to excellent health group.

Not unexpectedly, the age of the poor health group is higher (49 years) as compared with the fair and good to excellent health groups (46 and 42 years, respectively). Household size for those in fair or good to excellent health is about the same (2.6), while the household size for those in poor health is significantly lower at 2.4. The risk tolerance distributions of households in the three groups are significantly different, with about two thirds of those in poor health reporting low risk tolerance as compared with only 51% and 31% of those in fair health and good to excellent health, respectively. About 8% of households with a respondent and/or spouse or partner (if present) in poor health have above average to substantial risk tolerance, while one quarter of those in good to excellent health and 17% of those in fair health report above average to substantial risk tolerance.

A significantly higher proportion of households in poor health experience income uncertainty (47%) as compared with the two other groups (40% fair health and 32% good to excellent

health). The life expectancy of households with a respondent and/or spouse in poor health is significantly lower at 73 years as compared with 78 and 83 years for the fair health and good to excellent groups, respectively. The proportion of each group reporting a bequest motive was also significantly different, with about 8% of the good to excellent health group, 11% of the fair health group, and 14% of the poor health group wanting to leave money for their heirs. Wealth and income were significantly different for the three groups, with both being highest for the good to excellent health group and lowest for the poor health group. More than one third of the poor health group have a planning horizon (for saving and spending) of the next few months as compared with about 30% of the fair health group and 18% of the good to excellent health group. The education distributions were more heavily weighted toward higher levels of education for the good to excellent health group, and more heavily weighted toward the lower levels of education for the poor health group, with the fair health group falling in between.

Logistic Regression Results

The results of the likelihood ratio test, the score test, and the Wald test show that the logistic regression model is a significant improvement over the null model ($p < 0.0001$). The Hosmer-Lemeshow (H-L) test of the logistic regression model yielded a χ^2 of 7.59 and was insignificant ($p > .05$), suggesting that the model fit to the data well. For the assessment of the predicted probabilities, the percent concordant was 74.1.

Being in poor health is associated with a significantly lower likelihood of saving regularly ($p < 0.01$), as is being in fair health ($p < 0.05$). Those in fair health have odds of being a saver that are 0.8 that of those in good to excellent health, while the odds for the poor health group are 0.47 that of those in good to excellent health. Households with a respondent and spouse or partner (if present) who have private health insurance are significantly more likely to be savers ($p < 0.001$), as are households with government-sponsored health insurance (e.g., Medicare for seniors and Medicaid for low-income; $p < 0.05$). The odds of being a saver for those with private health insurance are 1.66 times that of a household without health insurance. The odds of being a saver for a household with government health insurance are 1.37 times that of a household without health insurance. Households with a respondent and/or spouse or partner (if present) who smokes are significantly less likely to smoke ($p < 0.001$), with odds of saving that are 0.68 times that of a household without a respondent and/or spouse or partner (if present) who smokes.

Households with a separated/divorced, widowed, or never married respondent are significantly less likely to be savers as compared with household heads who are married. Respondents who are separated/divorced show the lowest odds of being a saver (OR = 0.44) as compared with odds of 0.49 and 0.65 for widowed and never married households, respectively. Having a greater number of household members is associated with a lower likelihood of being a saver ($p < 0.001$), as is having lower income than normal ($p < 0.001$). Low risk tolerance and income uncertainty are also associated with a significantly lower likelihood of being a saver ($p < 0.001$). Having a saving horizon of the five years or longer is associated with a significantly higher likelihood of being a saver ($p < 0.001$). Being a college graduate is associated with a significantly higher likelihood of being a saver ($p < 0.01$), with odds of

saving that are 1.59 higher for college graduates as compared with those who did not complete high school.

Conclusion

In this exploratory study we investigated the relationship of fair and poor health with household saving. The results indicate that households with a respondent and/or spouse (if present) in fair or poor health are less likely to save regularly than those without such an individual in fair or poor health. Poor health leads to a greater decrease in the likelihood of saving as compared with fair health, indicating that these households with a respondent and/or spouse (if present) in poor health may be spending more on health care or experiencing a greater loss in income. This finding is in agreement with the argument of Smith (1999) that savings may fall as current health deteriorates because poor health reduces current income or increases consumption or medical expenses. Further research on why these households are less likely to save is necessary, such as whether their medical expenditures are higher, their income is lower, or they choose not to save because they do not think they will live much longer.

The results show an interesting connection between health insurance and savings behaviour, as both private health insurance and government health insurance are associated with an increased likelihood of saving as compared with those who do not have any health insurance. Means-tested government assistance programs, such as Medicaid, generally have asset limits in order to be eligible and thus provide a direct incentive against asset accumulation (Scholz & Levine, 2003). We grouped all government health insurance programs together into one variable, so we do not know if there are differences in the relationship between these types of government health insurance programs in terms of their relationship with saving behaviour. Future research separating out the different types of health insurance could provide more information on this topic.

Households with a respondent and/or spouse (if present) who smokes were shown to be significantly less likely to save, with odds of saving that were 0.68 that of households without a respondent and/or spouse (if present) who smokes. This may indicate that those who smoke focus more on the present rather than on the future. However, the smoking variable is highly significant ($p < 0.001$) even when adjusting for planning horizon. Those with a longer life expectancy were significantly more likely to save, indicating that the belief that one will live longer may increase saving. It would be interesting to explore how the saving behaviours of smokers differ from those of non-smokers, as there are many factors that could affect this finding, as well as to explore how smoking and life expectancy mediate the relationship between health and saving using other statistical methods.

The results of this study do not show a significant difference in saving among different racial/ethnic groups after adjusting for all other variables in the model. This is in contrast to previous studies showing evidence of a difference in saving behaviours among different racial and ethnic groups. Thus, researchers may want to consider including factors such as health status, health insurance status, and smoking behaviour in models of saving in the future.

The results also fail to provide evidence of a relationship between income and saving or between wealth and saving, which is in contrast to many studies showing that wealth and income are positively related to saving. Including wealth and income in the model as categorical variables rather than continuous variables could show different results and will be explored in the future. A limitation of the present study is that a dichotomous measure of saving was used, so a future study based on the amount saved could provide richer information.

The current results regarding the relationship between health and saving show that poor or fair health status are associated with a lower likelihood of saving. As a large body of research shows that health and economic well-being are closely related, it is important to continue investigating the links between the two. It is also important to consider health status in any study on economic well-being. Much is unknown about the relationship between health status, health insurance, and saving behaviours, and continued research on this relationship is necessary.

Table 1 Characteristics of Sample and by Health

Variable	Total Sample (n = 3,490)	Good to Excellent Health (n = 2,539)	Fair Health (n = 746)	Poor Health (n = 205)
Saver ^{***}	33.72%	38.41%	24.09%	10.74%
Health status				
Good to excellent	72.76%	-	-	-
Fair health	21.37%	-	-	-
Poor health	5.88%	-	-	-
Health insurance status				
No health insurance ^{***}	15.45%	13.50%	21.04%	19.17%
Govt health insurance ^{***}	15.65%	11.08%	23.54%	43.66%
Private health insurance ^{***}	68.90%	75.42%	55.42%	37.17%
Smoke ^{***}	29.06%	23.96%	41.71%	46.16%
Age ^{***}	43.59	42.40	46.06	49.28
Marital status				
Married ^{***}	50.54%	51.07%	50.76%	43.25%
Living with partner ^{***}	9.13%	8.02%	11.73%	13.37%
Separated/divorced ^{***}	19.68%	19.43%	18.55%	26.90%
Widowed ^{***}	3.84%	3.16%	5.76%	5.39%
Never married ^{**}	16.81%	18.33%	13.21%	11.08%
Number of household members ^{***}	2.63	2.64	2.65	2.39
Income higher than normal ^{**}	9.69%	9.91%	8.46%	11.48%
Income about normal ^{***}	73.52%	75.04%	70.63%	65.09%
Income lower than normal ^{***}	16.79%	15.05%	20.91%	23.42%
Risk tolerance				
Above average to substantial ^{***}	22.95%	26.03%	16.50%	8.25%
Average ^{***}	39.30%	42.55%	32.17%	24.97%

Variable	Total Sample (n = 3,490)	Good to Excellent Health (n = 2,539)	Fair Health (n = 746)	Poor Health (n = 205)
Low ^{***}	37.75%	31.41%	51.33%	66.78%
Income uncertainty ^{***}	34.58%	31.87%	40.46%	46.74%
Life expectancy ^{***}	81.59	83.21	78.45	72.92
Bequest motive ^{***}	8.87%	7.94%	10.59%	14.15%
Wealth ^{***}	\$467,957	\$557,870	\$251,671	\$141,067
Income ^{***}	\$84,490	\$94,842	\$58,149	\$35,070
Planning horizon				
Next few months ^{***}	22.01%	18.48%	29.50%	38.50%
Next year ^{***}	11.82%	11.78%	12.57%	9.65%
Next few years ^{***}	25.97%	25.63%	28.34%	21.60%
Next 5-10 years ^{***}	25.60%	28.62%	17.73%	16.78%
Longer than 10 years ^{***}	14.59%	15.48%	11.86%	13.48%
Race				
Non-Hispanic White ^{***}	67.22%	68.97%	61.64%	65.91%
Non-Hispanic Black ^{***}	13.57%	13.10%	13.97%	17.96%
Hispanic ^{***}	14.59%	13.08%	20.09%	13.30%
Other ^{**}	4.62%	4.86%	4.29%	2.84%
Education				
Less than high school ^{***}	11.86%	8.12%	19.75%	29.61%
High school ^{***}	31.59%	28.88%	37.64%	43.14%
Some college ^{**}	19.44%	20.19%	18.50%	13.52%
College graduate ^{***}	37.11%	42.81%	24.11%	13.73%

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 2 Logistic Regression Results

Variable	Coefficient	Odds Ratio
Health status (good to excellent)		
Fair health	-0.220*	0.80
Poor health	-0.750**	0.47
Health insurance status (no health insurance)		
Government health insurance	0.311*	1.37
Private health insurance	0.507***	1.66
Smoke	-0.393***	0.68
Age	0.045*	1.05
Age-squared	-0.001*	0.99
Marital status (married)		
Living with partner	0.069	1.07
Separated/divorced	-0.812***	0.44
Widowed	-0.714**	0.49
Never married	-0.432**	0.65

Variable	Coefficient	Odds Ratio
Number of household members	-0.165***	0.85
Income compared to normal (about normal)		
Higher than normal	-0.108	0.90
Lower than normal	-0.612***	0.54
Risk tolerance (average)		
Above average to substantial	0.067	1.07
Low	-0.590***	0.55
Income uncertainty	-0.313***	0.73
Life expectancy	0.007*	1.01
Bequest motive	0.094	1.10
Wealth	-0.000	1.00
Income	0.000	1.00
Planning horizon (next few months)		
Next year	0.192	1.21
Next few years	0.262	1.30
Next 5-10 years	0.587***	1.80
Longer than 10 years	0.756***	2.13
Race (non-Hispanic white)		
Non-Hispanic Black	0.068	1.07
Hispanic	0.063	1.07
Other	-0.245	0.78
Education (less than high school)		
High school	-0.091	0.91
Some college	0.151	1.16
College graduate	0.464*	1.59

* $p < .05$. ** $p < .01$. *** $p < .001$

Biography

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PIP-Model for pre-service teachers in the practices of ESD

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Abstract

The purpose of this research is to develop a model for improving pre-service teachers' skills in Education for Sustainable Development (ESD) and examine its effectiveness. To attain this purpose, the model, Projection Images by Photography (PIP) was adopted and the PIP-Method was developed. The participants consisted of 140 Japanese pre-service teachers. First, the pre-service teachers identified issues of sustainability, and next they took photos based on their own problematic awareness of sustainable issues. Then the pre-service teachers planned their own ESD practices. Pre-service teachers compared their own photos with those taken by the children, and found similarities and differences regarding how teachers and children respectively interpreted their own problematic awareness of sustainable issues. Finally, they reflected on their own plans through the use of the PIP and the revised plans, referring to the children's photos. The effectiveness of the PIP-Model was measured by the notions of how pre-service teachers revised their improved teaching plans for ESD practices. The result indicated that pre-service teachers comprehended problems in the first ESD practice plan and were able to improve their plans, taking into account children's sustainable developmental processes. Thus, we have proved that the PIP-Model is effective teaching for ESD practice.

Introduction: The concept of ESD in JAPAN

It is widely recognized that sustainable development refers to development that meets the needs of the present without compromising the ability of future generations to meet their needs (Brundtland, 1987). In 1992, the UN Conference on Environment and Development (Earth Summit) was held in Rio de Janeiro, and the common recognition was reaffirmed that "Education" is the foundation for achieving Sustainable Development (SD). Thereafter, the UN Commission on Sustainable Development (CSD) proceeded to investigate the role of education in sustainable development (ESD). Thus, it is vital to improve pre-service teachers' skills in ESD, since they need to learn Family and Consumer Sciences as part of teacher training courses in the university and will teach ESD to children in the future.

As the country proposing the Decade of Education for Sustainable Development (DESD), Japan has set to work promoting ESD with the cooperation of ESD-related international organizations, government agencies, NGOs and grass-roots organizations. Japan has accumulated a wide range of knowhow and experience regarding the implementation of ESD as well as insights into tasks that still need to be tackled (Maruyama, 2011). However, it is not easy to answer this simple question, "What is ESD?" The general understanding about ESD in Japan is that ESD differs from traditional environmental education in the way that teachers

and students change their own lifestyles, values and behaviour beyond transferring knowledge, simply for the protection of the natural environments at school levels (Maruyama, 2011). This implies that the concept of ESD covers a very wide territory. The Asia-Pacific Cultural Centre for UNESCO (ACCU) describes ESD as learning about how children and adults become capable of investigating, thinking, sharing opinions, and taking action together in schools, families, communities, countries, as well as on the world stage to continue to live sustainably in the future (ACCU, 2009).

ESD practices in school education and universities in JAPAN

In school education, currently, the government's new curriculum guidelines emphasize SD, and ESD content has been introduced to Japan's compulsory education and is expected to advance ESD activities effectively. Actually, ESD practices are already somewhat familiar to us within the subjects of Family and Consumer Sciences, Social Studies, Science, Moral Education and Integrated Studies introduced in 2000. ESD practice resides in various other subjects at school levels for each developmental stage, that is, elementary school (Kodama, 2009; Kishimoto & Sato, 2010), junior high school (Ezaki, Nomura, & Kawakami, 2010), and high school (Yuasa et al., 2010; Yuasa et al., 2011). Some remarkable practices have been observed in these schools.

There are local NGOs, international organizations and research institutes leading the cooperation with schools. UNESCO Associated School Project Network (ASPnet) has been rapidly growing in recent years to encourage their learning activities to focus more on ESD than other types (Maruyama, 2011). ACCU introduces good examples of the practices that collect good ESD practice, explain a common approach to ESD, and justify this with the competency which students and adults would obtain through the practice (ACCU, 2009).

The role of higher education and research has much to contribute to the global efforts for ESD. ESD practices in higher education levels in Japan are the most active groups in the world and have been actively practised in Japan (Nomura & Abe, 2010). There are two types of ESD practices in higher education in Japan: research-based ESD and education-based practices (Nomura, Ota, & Takahashi, 2010). The research-based ESD practices are characterized as interacting with the community for regional contributions (Oguri, 2010; Tomita, Ito, Hara, & Fujii, 2010). Moreover, the research network is strengthened by higher education institutes called "Univ-net" on a national level. The eight universities assist the ESD programme development at the local school level and exchange information among local areas in Japan (Nomura, 2010).

The education-based ESD practices are divided into two types. One is the ESD practices in liberal arts education to develop human resources for practitioners of SD (Honoki, 2008; Tama, 2009). The other is for professional training as part of teacher education, professional education for educational leaders, and community educators (ESD/RCE Promotion Committee, Muiyagi University of Education, 2009). Similar efforts have been undertaken by several universities (Kawata, 2011). However, limited research has been reported about models for enhancing pre-service teachers' skills in ESD.

Projection Images by Photography (PIP) Method Design

Nagata (2009) pointed out that mutual learning and self-reflection were required in the practices of ESD. In this sense, the model for pre-service teachers is needed for the following components:

1. enhancing pre-service teachers' awareness of Sustainable Society,
2. deepening their knowledge in order to understand Sustainable Development,
3. knowing what children are thinking about sustainability and finding out the similarities and differences between pre-service teachers' images and those of children,
4. reflecting on their first plans in ESD, and
5. revising their first plans and creating new versions.

To cover these components, Projection Images by Photography (PIP) was adopted. PIP is a projective method that uses photographs to capture perceived environments. Oishi (2010) pointed out the following three advantages of this method: (a) it can express an individual and the surrounding environments as integrated, instead of as independent beings; (b) the internal world of an individual, which cannot be measured by verbal expression, can be visually prompted; and (c) it is free of disadvantages from drawing skills and spending too much time. PIP made it possible to become acquainted with the children's everyday lives and their thoughts through revealing "favored features", "greatest concerns" and "most significant memories" (Oishi, 2010, p. 131).

PIP has been used in architecture, psychology, and other related fields, and has been proven effective in these fields (Kamiyama & Dohi, 1996; Okamoto, Hayashi, & Fujiwara, 2009; Tsuzuki, 2005; Ziller, 1990, 2000; Ziller & Lewis, 1981). Recently, the PIP has made it possible to not only subjectivize, but also objectivize the relationships between an individual and an environment by requiring comments that describes the picture (Tseng, Endoh, & Morinaga, 2001).

This model, including PIP for self-reflection, was developed on the basis of the action research model (McKernan, 1996; McTaggart et al., 1982). Action research was known to be able to empower teachers to become critical practitioners (Carr & Kemmis, 1986). Additionally, Moreira, Vieira, and Marques (1999) argued that it was effective for pre-service teacher development through the use of action research. This was why the PIP Method was developed, based on the action research process.

The PIP Method consists of five steps, as shown in Figure 1:

- Step1: Pre-service teachers identify issues of sustainability,
- Step2: Pre-service teachers come up with their own ideas for ESD practices,
- Step3: Pre-service teachers create their own plans for ESD practices,
- Step4: Pre-service teachers reflect on their own plans through the use of the PIP,

- Step5: The revised plans follow these stages.

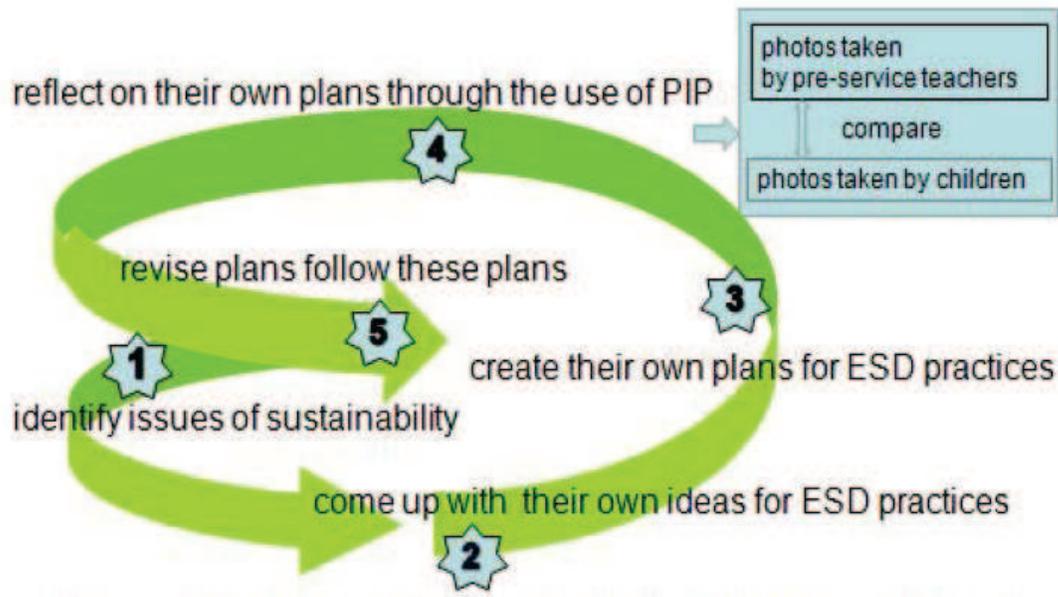


Figure 1 PIP Method for improving pre-service teachers' skills for ESD practices

Method

Participants

The participants consisted of 140 Japanese pre-service teachers (75 males and 65 females) who were studying in the Training Division for Elementary School Teachers of the Faculty of Education in a university on the mainland of Japan. They were studying to obtain teaching certificates for elementary school in this training division. This university is one of the largest state-run universities located near to the Tokyo metropolitan area on the main island of Japan. As shown in Table 1, the participants' ages ranged from 19 to 27; they are in the second year of their 4-year studies.

A teaching practicum is a required course that trains pre-service teachers through actual teaching under the guidance of elementary school teachers for a period of 4 weeks. Chiba University Training Division provides student teachers' teaching practicum in the third year of their 4-year studies. Therefore, in the second grade, participants have to learn practical teaching skills for preparing for the teaching practicum.

Table 1 Sample Characteristics of Participants ($n=140$)

Characteristic	n
Sex	
Male	75
Female	65
Age (in years)	
19	45
20	70
21	10
22	4
23	4
24	2
25	2
26	2
27	1

Procedures

The PIP Method was set up in the class of Teachers Training of Elementary School in Family and Consumer Sciences. The aim of this class is for pre-service teachers to acquire teaching skills including acquisition of knowledge, attitudes and beliefs to understand their studies of Family and Consumer Sciences. Improving the quality of life is of central importance to family and consumer sciences education. In order to improve the quality of life, sustainable lives should be pursued for future generations rather than affluent and convenient lives, as is the case at present. Therefore, it seemed to be salient to enhance pre-service teachers' teaching competencies in Family and Consumer Sciences Education from the standpoint of SD. As shown in Figure 1, the PIP Method consisted of five steps.

Firstly, pre-service teachers learned about sustainable lives and identified issues of sustainability. Based on their problematic awareness, they took two photographs on the theme "Sustainable Development" using digital cameras or mobile phones with a built-in camera. Next, they discussed how they related the issues of sustainability to ESD practices. Then the pre-service teachers came up with their own ideas for ESD practices. As the next step, the pre-service teachers created their own teaching plans for ESD practices. At the same time, they had to decide their objectives and materials for their own plans.

The pre-service teachers then compared the photos they had taken themselves with those taken by elementary school children. Beforehand, the authors had asked two elementary

school teachers who taught second- and fifth-graders to collect the photos taken by children on the theme of sustainable development (37 second-graders and 20 fifth-graders). The pre-service teachers analyzed similarities and differences between their photos and those of elementary school pupils and reflected systematically on their teaching plans using the photo data. Finally they carried out practical assessments of their work and reexamined the objectives and materials of their own first teaching plans for ESD practices, taking into account the pupils' awareness of SD. Based on their assessments and re-examinations, they revised the new teaching plans.

In order to clarify the educational effectiveness of the PIP Method, pre-service teachers were asked to evaluate their own promotions of the improved ESD practices comparing with first ones. In other words, the effectiveness of the PIP Method and pre-service teachers' professional development for ESD were measured by comparing the revised teaching plans with their original ones. Additionally, the pre-service teachers were asked to give comments about their experiences when they finished the PIP Method. Their comments reflected how they perceived and valued the method.

Measurement

The purpose of the research was to develop the PIP model for improving pre-service teachers' skills in ESD and to examine its effectiveness. To this effect, the checklists to evaluate pre-service teaching plans were developed on the basis of the views which the Japan Council on the UN Decade of Education for Sustainable Development (2006) called "the essence of ESD". This council advocated that the organizations and individuals from various fields of education that are covering various social issues - including the environment, development, human rights, peace, gender, cultural diversity and social welfare -- should be connected under the umbrella of ESD. In addition, it stressed the importance of the essence of ESD which consisted of "Values", including human co-existence and human dignity; "Abilities desirable to be developed", such as the multilateral point of view and communication skills; and "Methods of learning", such as the method of participatory learning and the method of consensus-building.

McKeown (2002) showed that ESD must also give people practical skills including the ability to communicate effectively and to think critically about value issues. "The essence of ESD" of the Japan Council and McKeown's practical skills was modified, and checklists compiled for the evaluation, taking into account pre-service teachers' professional development levels. This evaluation was used for pre-service teachers to identify how they revised the new teaching plans from the original ones and on which points of values, abilities, and methods of learning they focused for revising them. In summary, the results of the checklists for the evaluation indicated the improvements in their teaching plans. The contents of the checklists for the evaluation were as follows:

1. Values which ESD prioritizes:
 - The value that human dignity is invaluable.
 - The value of our responsibility for establishing a socially and economically fair society.
 - The value that the current generation is responsible for future generations.

- The value that human beings are a part of nature.
- 2. Desirable Abilities to be developed through ESD:
 - The ability to think critically about value issues.
 - The ability to communicate effectively.
 - The ability to accept and respect different values.
 - The ability to seek concrete solutions.
 - The ability to implement them spontaneously.
- 3. Methods of Learning which ESD prioritize:
 - The participatory methods are utilized.
 - The methods in which learners work on real issues in a practical manner.
 - The methods in which individual initiatives of the learners are respected.
 - The methods in which the parties involved can learn from each other.
 - The methods in which learners are not induced to the one and only correct answer prepared initially.

Moreover, pre-service teachers were asked to make or give their own comments on what they felt and thought about after using the PIP Method.

Results

Pre-service teachers' teaching plans

Table 2 indicates the issues that the pre-service teachers selected in their teaching plans for ESD practices. It shows that their awareness of issues for sustainability ranged over various aspects. Food-related issues were mostly chosen; then, more than 20 pre-service teachers selected the promotion of ecological life and the reduction of waste amounts as the issues for the ESD practices.

Table 2 Selected Issues in ESD Practices (N=140)

Issues	n
Food-related issues	41
Ecological life	28
Wastes issues	25
Recycling	12
Energy issues	10
Gender issues	7
Natural resource issues	6
Welfare issues	3
Others	8

Improvements of revised teaching plans

Table 3 demonstrates the selected items in value, abilities, and methods of learning which pre-service teachers prioritized when they revised their teaching plans. As shown in Table 3, 44 pre-service teachers (31.4%) gave priority to the value of “we are responsible for establishing a socially and economically fair society.” Also, the values of “the current generation is responsible for future generations” and “human beings are a part of nature” were chosen by more than 30 pre-service teachers as the important values for ESD.

Table 3 Selected Items for Improvements of Revised Teaching Plans

Item	Frequency <i>n</i> = 140	
	<i>n</i>	%
Values which ESD prioritise		
The value that human dignity is invaluable	27	(19.3)
The value of our responsibility for establishing a socially and economically fair society	44	(31.4)
The value that the current generation is responsible for future generations	34	(24.3)
The value that human beings are a part of nature	35	(25)
Desirable abilities to be developed through ESD		
The ability to think critically about value issues	18	(12.9)
The ability to communicate effectively	23	(16.4)
The ability to accept and respect different values	18	(12.9)
The ability to seek concrete solutions	45	(32.1)
The ability to implement them spontaneously	36	(25.7)
Methods of learning which ESD prioritise		
The participatory methods are utilised	38	(27.1)
The methods in which learners work on real issues in a practical manner	36	(25.7)
The methods in which individual initiatives of the learners are respected	26	(18.6)
The methods in which the parties involved can learn from each other	22	(15.7)
The methods in which learners are not induced to the one and only correct answer prepared initially	18	(12.9)

However, 45 pre-service teachers (32.1%) prioritized “The ability to seek concrete solutions” and 36 of them (25.7%) placed importance on “The ability to implement spontaneously” in ESD practices. “The ability to communicate effectively” was selected by more than 20 pre-service teachers as the ability that they intended to develop through ESD.

As the methods of ESD learning, 38 (27.1%) and 36 (25.7%) pre-service teachers gave priority to “participatory methods are utilized” and “learners work on real issues in a practical manner”. A few pre-service teachers valued the learning methods of “individual initiatives of the learners are respected” and “the parties involved can learn from each other” while carrying out ESD.

Educational effectiveness of PIP Method

Pre-service teachers’ comments indicated the educational effectiveness of the PIP Method for ESD practices. One female student teacher noted, “the PIP is a good method. It is easy for us to understand children’s thinking and learning about ESD even if they are at an early stage of development.” A male student wrote, “This method makes us able to crystallize our own thoughts about ESD and share our ideas with others easily by giving the shape of a picture.” One pre-service teacher voiced his opinion as follows, “I believe this method makes it possible to improve my teaching skills.”

Discussion

Pre-service teachers’ understanding of children’s sustainable developmental processes appeared to be improved by the use of the PIP. Pre-service teachers explicitly comprehended children’s thoughts and perceptions concerning sustainability, comparing the photos they had taken themselves with those taken by children. Based on their understanding of children’s sustainable developmental processes, pre-service teachers could improve their initial plans. After the PIP, they became aware of the important values which had to be prioritized for ESD practices (Japan Council on the UN Decade of Education for Sustainable Development, 2006; McKeown, 2002). For instance, they, as people in the current generation, prioritized that they are responsible for establishing a socially and economically fair society, for being responsible for future generations, and the value that human beings are a part of the nature.

Additionally they revised their teaching plans through the PIP, commending more respectful consideration of the ability to seek concrete solutions and of the ability to implement their plans spontaneously. The National Commission for UNESCO in Japan (2007) and Department for Education and Skills in England (2005) also recommended that teachers develop these abilities in ESD. Furthermore, in order to enhance such abilities in children through the use of ESD practices, pre-service teachers recognized the importance of participatory methods and learning about real issues in a practical manner.

As these results have shown, the PIP helped pre-service teachers make progress in teaching skills in ESD. In the comments, pre-service teachers said that they had learned that children develop their own sustainability as they play and interact with each other naturally utilizing the PIP, and the PIP was instrumental in modifying their teaching plans for the better. Oishi (2010) also pointed out that the PIP made it possible for participants to become acquainted with children’s everyday lives and thoughts. This was congruent with the results of this research.

Conclusions

In this research we were able to clarify the effectiveness of the PIP Method. In order to improve any educational models, we have to understand children's behavior and actions. Although children could not express their own thoughts and awareness of sustainability very well, we have proved that the PIP was useful for understanding children's thoughts and awareness of sustainability more explicitly. The pre-service teachers in this study appeared to comprehend problems on the first ESD practice plans and were then able to improve their plans. The result of the study indicated that by improving certain issues, the PIP model seemed to be effective. In particular the PIP model is instrumental for pre-service teachers to develop their own teaching skills autonomously.

At the same time, we were able to imagine children's behaviour and actions through the photos taken by children. In modern society cell phones with cameras and digital cameras are becoming a natural part of children's worlds. This research suggests some useful functions of those devices for education.

Biography

Yoko Ito is a professor of Faculty of Education at Chiba University in Japan. She received her doctorate in educational psychology from Ochanomizu University in 2003 and her master's degree in child development from Ochanomizu University in 1983. She has served as the chief editor of the JAHEE from 2007 to 2011. She has published numerous articles and book chapters on child development education in Home Economics. Her current research interests include Education for Sustainable Development in Home Economics. She also takes part in cross-cultural studies of pre- parenting education in China, Japan, the United States and Sweden. E-mail: itoh.yoko@faculty.chiba-u.jp

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Assessment of the competitiveness of the apparel manufacturing industry in Malawi

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Abstract

The success of any business entity depends on its ability to compete favourably both at domestic and international markets. The objective of this study was to assess the status of the apparel manufacturing industry in Malawi and to assess its competitiveness using Porter's Theory of Competitive Advantage. Using qualitative research methods, government officials, owners of companies producing for export, and employees completed open-ended and multiple-choice response questionnaires and participated in in-depth oral interviews. Questions were designed to address four basic research questions. The total sample size was 20, including 11 participants for the paper and pen questionnaire and 9 for the in-depth oral interview. Institutional Review Board (IRB) approval was obtained prior to conducting research. Content analysis was used to analyse data.

Results of this study showed that the Malawian apparel manufacturing industry responsible for export does not satisfy any of the criteria of Porter's Theory of Competitive Advantage. More work needs to be done in the area of infrastructure, transportation, raw materials, capital, and qualified personnel among others. The government can continue to invite foreign investors as suggested; however, as long as the domestic problems exist, investors will relocate to other countries that offer more favourable investment conditions.

Key words: Assessment, competitiveness, apparel industry, manufacturing, Malawi

Introduction and objectives

The apparel manufacturing industry in Malawi has potential for growth and competitiveness because of availability of cheap labour that attracts foreign investors, local production of cotton, a burgeoning textile industry, and an environment conducive to modern technology adoption at relatively low cost (Kim, Traore, & Warfield, 2006; Muradzikwa, 2001; NWGTP, 2009; RATES, 2003). In addition, Malawi's participation in several trade agreements, both within and outside Africa, and its affiliation to international bodies such as the World Trade Organization has created opportunities for the industry to participate in international trade, thereby opening up more business opportunities for the apparel manufacturing industry.

Although there have been a number of studies about apparel manufacturing in Sub Saharan Africa, some of which have been generalised to Malawi (Adhikari & Yamamoto, 2005; Frazer, 2008; Jauch, 2002; RATES, 2003; SOMO, 2003; Traub-Merz & Jauch, 2006), more studies are needed in order to have a more complete understanding of the manufacturing industry in

Malawi. Some studies conducted in Malawi show variations in the number of companies producing apparel for export (MCCCI, 2008; Nakagawa *et al.*, 2009; NWGTP, 2009; Weathers, 2003). Nkhoma (2007) and the NWGTP (2009) reported a small number of large manufacturers dominating the apparel manufacturing sector. These authors did not provide the exact number of companies producing for export. Other sources reported eight companies that produce for export (MCCCI, 2008; Nakagawa *et al.* 2009). Weathers (2003) reported that as of August 2002, three apparel companies were exporting apparel products under AGOA. According to the chairperson of the Garment and Textile Association of Malawi (GTMA), the apparel and textile industry used to produce assorted men and women's wear, cotton, blankets and assorted textiles. The industry's performance has been declining over the past 10 years as evidenced by the small number of companies producing apparel for export.

There has also been a decrease in the amount of apparel products exported to the US under the African Growth and Opportunity Act (Malawi Ministry of Trade and Industry, 2011) and inability of the apparel and other manufacturing industries to retain foreign investors (Chikhasu, 2007; Kazembe & Namizinga, 2007). Such variation was an indication of the need for research to identify the current industry's status. This study adds to the literature because it provides a more recent picture of the apparel industry. In addition, previous studies have focused on other aspects such as the decline of the apparel industry. This current study assesses the competitiveness of the apparel industry in a global market.

Initially this study focused on the export market. However, due to closure and relocation of some companies, data were collected from one company producing for export and two companies that are producing for domestic consumption but had exported in the past. The variations in the literature and the decline of the Malawian apparel industry over the last ten years solicited the question "Is the Malawian apparel manufacturing industry competitive?" The purpose of this study was to describe the status of the apparel manufacturing industry and assess the competitiveness of the Malawian apparel manufacturing industry using Porter's Competitive Advantage Theory.

Operational definitions

Malawi is a landlocked country located in the north-eastern part of Southern Africa with a population currently estimated at 13,077, 160 (Malawi National Statistical Office). It shares borders with Mozambique in the south, Tanzania in the northwest, and Zambia in the east.

Definition of export processing zones

According to the World Bank (1998), Export Processing Zones (EPZs) are industrial estates with a size range between 10 and 300 hectares specializing in manufacturing for export. In Malawi, there are no specific industrial estates dedicated to export processing; however, firms are designated the status of Export Processing Zones (EPZs) and are located in areas of choice and convenience to the investor (Nkhoma, 2007). Any company can apply for EPZ status under the Export Processing Zone Act (Nkhoma, 2007; SADC, 2011). Malawi regarded Export Processing Zones as an important and reliable strategy for integration into the global economy (Jauch, 2002). The significance of this concept is that Malawi's definition of EPZ is different and does not suit the descriptions by others (Deardorff, 2011; Jauch, 2002; Kusago &

Tzannatos, 1998; The World Bank, 1998). Such an understanding is important for foreign and domestic investors as well as all stakeholders in their pursuit of export processing, trade agreements, and future decisions regarding the apparel manufacturing industry in Malawi.

Definition of Industrialization

In simple terms, industrialization refers to heavy manufacturing. After gaining independence in 1964, the Malawian government embarked on three phases of industrialization to develop the economy. The period between 1964 and 1979 was mainly import substitution industrialization. From 1980 to 1994, the government adopted an export-oriented strategy. From 1994 to the present, the government embraced trade liberalization with most trade policies favouring export-oriented manufacturing (Chatima, 2007). This concept provides a basis of understanding the phases of trade in Malawi, that is, from an agricultural to a capital economy.

Definition of Export Promotion

Export promotion is producing apparel for international trade with an aim of increasing exports and usually the government uses special policies to achieve this objective (Deardorff, 2011). Malawi adopted this type of trade strategy since the 90s to increase exports at international markets in most manufacturing industries, including apparel (Chirwa, 2002; Traub-Merz & Jauch, 2006). Export promotion is a good strategy for contributing to the advancement of companies that have potential for developing and competing at international markets. The concept of export promotion is significant because it is the trade strategy used in Malawi since 1990 (Chirwa, 2002).

Definition of Import Substitution

Import substitution is an economic development strategy that replaces imports with domestic production (Deardorff, 2011). The government of Malawi adopted import substitution from the 1960s to 1980s with the expectation of developing the domestic apparel manufacturing industry and protecting it from foreign competition. Malawi actively participated in ownership partnership with domestic and foreign private capital between 1960s and 1980s (Jauch, 2002). This concept is significant because it is the first phase of the industrialization process in the Malawian apparel manufacturing industry since independence in 1964.

Definition of Trade Liberalization

Marchant and Snell define trade liberalization as a "...complete or partial elimination of trade-distorting government policies" (Marchant & Snell, 1997, p. 4). In the 1990s, most Sub-Saharan African countries including Malawi failed to pay foreign debts. These countries were advised by the World Bank and the International Monetary Fund to become liberalised economies (Traub-Merz & Jauch, 2006). Implementation of trade liberalization or openness aimed at helping industries in developing countries to grow and integrate into the global economy (Bhalla, Chipeta, Taye, & Mkandawire, 2002). The government of Malawi liberalised its economy in the 1990s, thereby becoming more open to foreign investment and international competition. The literature on trade liberalization gives the impression that there is a positive relationship between trade liberalization and economic growth of an apparel

manufacturing industry. This concept is significant in this study because it is associated with the decline of the apparel manufacturing industry in Sub-Saharan Africa.

Definition of Second Hand Clothing

Second hand clothing refers to used clothing (Frazer, 2008). In this study, second hand clothing refers to used clothing imported into Malawi from Western Europe and North America, initially meant for charity, but subsequently it became booming business (Field & Schmitz, 2007; Mhango & Niehm, 2005). The government of Malawi legalised importation of used clothing in 1994 (Mhango & Niehm, 2005). In this study, the concept of second hand clothing is significant because literature identifies it as one of the contributing factors to the decline of the apparel manufacturing industry in Malawi.

Porter's Competitive Advantage Theory

Porter's Competitive Advantage Theory (1990), also known as the Diamond Model, guided this study. The major underpinning of Competitive Advantage Theory is that success of an industry is based on four interrelated factors, namely, (1) factor conditions, (2) demand conditions, (3) related and supporting industries, and (4) firm strategy, structure and rivalry (Campaniaris, Hayes, Jeffrey, & Murray, 2011; McRee, 2002; Porter, 1990; Watchravesringkan, Karpova, Hodges, & Copeland, 2010).

Four Determinants of Competitive Advantage Theory

Competitive Advantage Theory provides insights into how companies can achieve competitive advantage, which is necessary for positioning and strengthening companies within the business environment. Figure 1 provides the four Theory of Competitive Advantage determinants.

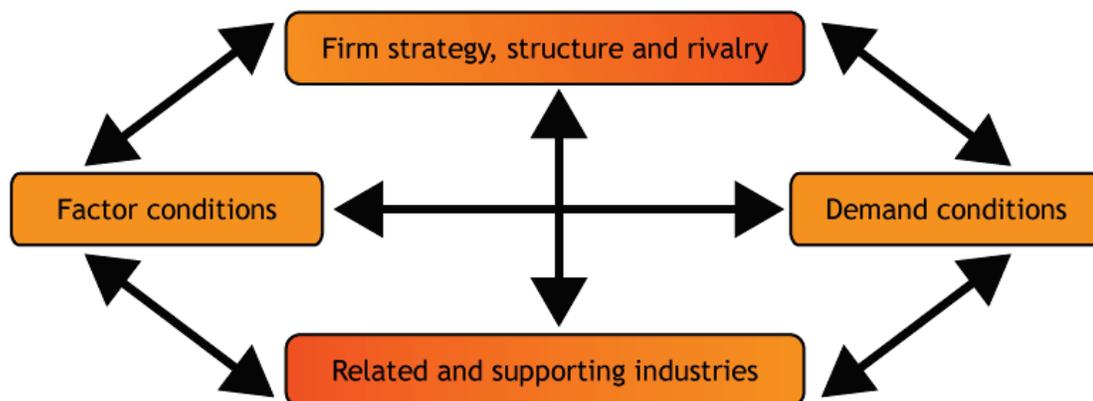


Figure 1 The four elements of Competitive Advantage Theory.

Determinant one: factor conditions

Factor conditions are drivers of production (Grant, 1991; Jin, 2004) and can be either basic or advanced (Porter, 1990). Basic factors such as natural resources, climate, location, unskilled, and semi-skilled labour are inherited passively. On the other hand, education and professional training helps foster advanced factors such as Computer Aided Design proficiency (Watchravesringkan *et al.*, 2010). Sledge (2005) found a positive relationship between advanced factor conditions and an industry's competitiveness.

Determinant two: demand factors

The Competitive Advantage Theory describes demand factors in terms of the number and type of buyers in the demand market (Jin, 2004). An industry's competitiveness depends on the domestic demand for a particular product or service (O'Shaughnessy, 1996; Watchravesringkan *et al.*, 2010). Competitive Advantage Theory also stresses the important role played by sophisticated, demanding, and influential domestic consumers in promoting an industry (Campaniaris *et al.*, 2011; Grant, 1991).

Determinant three: related and supporting industries

Industries that are highly competitive and interconnected influence the focal industry's competitiveness through innovation, upgrading, information flow and shared technology development (Grant, 1991; Jin, 2004; Porter, 1990; Watchravesringkan *et al.*, 2010). Watchravesringkan *et al.* (2010) reported that sustainability of an apparel industry's competitiveness depends on availability of advanced textile industries, educational institutions, related research organizations, and consulting firms in a particular country.

Determinant four: firm strategy, structure, and rivalry

Firm strategy, structure, and rivalry focus on conditions that govern the creation, organization, and management of companies besides the nature of the domestic rivalry in a country (Porter, 1990). Campaniaris *et al.* (2011) noted that the industry's strategy, structure, and rivalry shape stakeholders' attitudes towards market institutions, degree of domestic competition, and other factors that influence business transactions. These transactions occur between companies, companies and the government, as well as companies and their employees. Thus, success of a company depends on goals pursued, degree of competition from rivalry companies, and the nature of relationships among various stakeholders.

Other factors: chance and government role

Besides the Competitive Advantage Theory four elements, Porter identified another factor that affects the four determinants, namely chance and government role. Porter described chance factors as "events or occurrences that have little to do with circumstances in a nation and are often largely outside the power of firms to influence" (Porter, 1990, p. 124). For instance, political decisions and war by foreign governments are examples of chance factors (McRee, 2002; Porter, 1990; Watchravesringkan *et al.*, 2010). Chance factors are significant because they can disturb the competitive advantages of companies in different countries (McRee, 2002). They can annul the firms' established advantages and pave way for new

companies (Porter, 1990). Porter viewed the government as having both positive and negative influence on the Diamond Model.

Four determinants in the Malawian apparel industry context

In order to assess the Malawi's apparel manufacturing industry's competitiveness and capability to produce for both domestic consumption and export, this study incorporated questions developed using the four determinants of Porter's Competitive Advantage Theory as shown in Table 1. All aspects of the Diamond model were used to assess the Malawian apparel manufacturing industry's competitiveness.

Number and Determinant	Question
One Factor Conditions	Does Malawi have sufficient basic and advanced factors necessary for production?
Two Demand Factors	What is the demand market for apparel produced in Malawi? Describe the type of buyers in the Malawian apparel market.
Three Related and Supporting Industries	What supporting and related industries exist in Malawi? How have these industries contributed to the growth of the apparel manufacturing industry in Malawi?

Table 1 Assessing the Malawian apparel manufacturing industry using Porter's Competitive Advantage Theory

Since Determinant 1 (factor conditions) drives production. Questions on basic and advanced factors will provide insights into human and non-human resources available for production in the Malawian apparel manufacturing industry. Conversely, Determinant 2 (demand factors) relates to consumers. Even though this study focused on apparel manufacturing companies producing for export, questions on demand factors were crucial to the understanding of the size and type of consumers in Malawi. Determinant 3 (related and supporting industries), which deals with the availability and role of supporting and related industries, is necessary to verify the focal industry's competitive advantage. The focal industry in this study is the apparel manufacturing industry producing apparel for export. Examples of related and supporting industries are companies that produce raw materials for apparel construction, training institutes and research and development centres. Determinant 4 (firm's structure, strategy, and rivalry) provides an avenue for analysing relationships between the government and industry representatives, cluster and interconnected industries and the industry and their employees. Such an understanding is vital for future decisions regarding the industry. Lastly, questions on other factors present a basis for understanding the role and impact of government and chance factors on the apparel manufacturing industry.

Exploring chance factors is important because due to its geographic location, Malawi depends on neighbouring countries to ship raw materials and apparel products. Investigating the government's contributions is necessary in understanding the role of trade policies and strategies implemented by the government of Malawi to promote competitiveness in the apparel manufacturing industry. In general, Competitive Advantage Theory provides some insights into how countries achieve or fail to achieve competitive advantage. Results of this

study will provide some insights into whether the industry meets Porter's criteria of competitiveness or not.

Methodology

This section provides information about research questions, population and sample, instrument used, data collection, and analytical techniques. This study was conducted in Blantyre, a commercial and industrial city located in southern Malawi. Most companies producing for either export or domestic consumption are located in this city. It is important to note that there were several changes made in the sample size, data collection and analytical techniques.

Research questions

Due to variations in the literature about the number of companies producing apparel for export and the industry's decline over the past 10 years, several research questions were formulated, given Competitive Advantage Theory determinants. These research questions were:

- What is the status of the apparel manufacturing industry in Malawi?
- What factors are responsible for the status of the industry?
- What strategies have been put in place by the government and other stakeholders to improve the Malawian apparel manufacturing industry?
- Does the Malawian apparel industry meet Porter's criteria of competitive advantage?

Population and sample

Since literature indicated that there were eight companies producing apparel for export in Malawi, this study aimed at collecting data from 102 respondents selected from the eight companies, government departments responsible for trade, and a representative from the Garment and Textile Manufacturers Association of Malawi (GTMA). However, during data collection, it was found that all companies except one company was producing apparel for export. Other companies had closed, relocated to other countries or embarked on domestic production. This development brought changes in the sample size and data collection techniques. Data were thus collected from three companies, namely A, B, and C. Companies B and C no longer produce for export.

Paper and pen questionnaires respondents ($n = 11$)

The number of respondents who completed the paper and pen questionnaire is eleven ($n = 11$) and these respondents were employees from Company A. Ten employees who perform different jobs completed the employee questionnaire and one personnel responsible for managerial issues completed the manager's questionnaire.

In-depth oral interviews respondents ($n = 9$)

Of the total number of respondents ($n = 20$), nine ($n = 9$) participated in the in-depth oral interviews. Out of the nine participants, five were government representatives from different departments and who are directly involved in both domestic and international trade. Three respondents were owners of Company A, B, and C. The expert in Garment and Textile Manufacturers Association (GTMA) issues also participated in the in-depth oral interviews. The respondents and company names were represented by codes and letters respectively in order to preserve their identity. Company A is the only one producing apparel for export. Companies B and C are currently producing for domestic consumption. Even though most companies had ceased producing for export, collecting information from the owners of some of these companies was necessary because they had experience with exporting and would therefore provide information relevant to this study.

Data analysis

In this study, all interviews were transcribed, coded, and classified into major themes. The data under each theme were counted to determine their frequencies, which were converted into percentages and presented as figures and tables. The major themes identified during the analysis included status of the apparel manufacturing industry, contributing factors to that status, government's strategies to improve the apparel manufacturing industry, and suggestions for further improvement. Content analysis was used to analyse the usable data. Content analysis transposes qualitative data into quantitative data. It is a useful method for tabulating results of interviews and open-ended questions (The Texas State Auditor's Office, 1995). To achieve this, researchers count various aspects of the content identified under a particular theme, and present results as numbers and percentages (Colorado State University, 2005). Counting the number of responses or each theme helps to remove any subjectivity and simplify the identification of relationships, similarities, and differences within each identified theme. According to Taylor-Powell and Renner (2003), content analysis is useful for analysing and interpreting narrative data. Interviews with government and apparel manufacturing industry representatives yielded numerous and varied data, that had words and phrases that shared a commonality (Graneheim & Lundman, 2004), but needed to be translated into major themes (United States General Accounting Office, 1996), hence the use of content analysis (Elo & Kyngäs, 2008). Trochim (2000) and Stemler (2011) observed that content analysis is an unobtrusive and relatively rapid method for analysing data. The use of interview and questionnaire responses to create the database agreed with Trochim and Stemler's unobtrusive characteristic of content analysis.

Results and discussion

Status of the apparel manufacturing industry in Malawi

Figure 2 presents results of the study from the manager's pen and paper questionnaire and in-depth oral interviews with government and industry representatives and the expert in GTMA issues in Malawi ($n = 10$). Respondents described the industry using multiple terms as shown in Figure 2. There were no major differences in the percentages of respondents who categorised the industry as, being uncompetitive, experiencing slow growth, and having potential for

growth. Even though all respondents indicated that the industry is currently struggling, they acknowledged that it has potential for growth.

Contributing Factors to the Current Status

Figure 3 presents the percentage of respondents who identified a factor as contributing to lack of competitiveness of the Malawian apparel manufacturing industry. The major contributing factors to lack of competitiveness of the industry include poor infrastructure, electricity and water shortages, and lack of raw materials, high transportation costs, and imported apparel products. The abbreviations *Tl* and *ta* stand for trade liberalization and trade agreement.

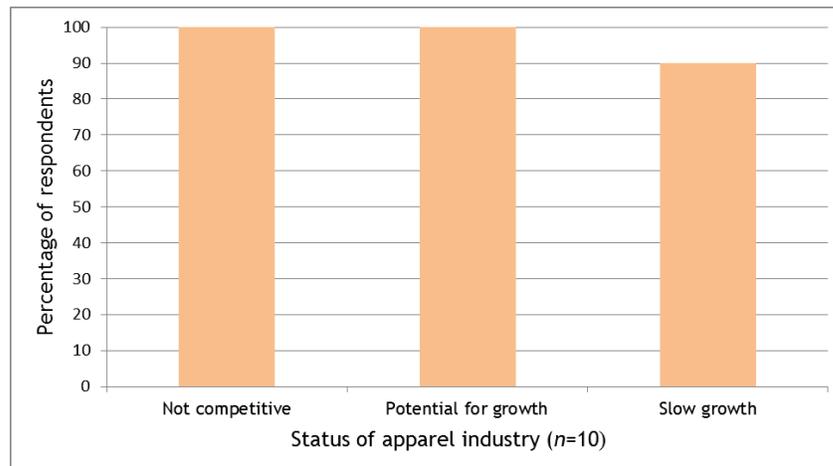


Figure 2 Respondents views of the status of the apparel manufacturing industry (In depth oral interviews).

Factor Conditions

As stated in the introduction, factor conditions are either basic or advanced in nature. While basic factors are inherited passively and may require little or no new investment, advanced factors, which require investment and innovation, form the basis for the sustainable competitive advantage of countries (Porter, 1990; Smit, 2010). Sledge (2005) noted a positive relationship between advanced factor conditions and an industry's competitiveness. Figure 3 shows that Malawi lacks sufficient basic factors such as raw materials and water resources but offers unskilled labour. All respondents ($n = 10$) indicated that the apparel manufacturing industry experiences water shortages and lacks raw materials for production. The knowledge resource base, the Garment and Textile Manufacturers Association of Malawi (GTMA) is weak, according to five respondents. Advanced factors, such as, skilled labour, capital and infrastructure also lack in the apparel industry. Respondents noted that Malawi relies on foreign expertise for jobs like designing, quality inspection, and pattern development using different computer software. According to all respondents, Malawi has poor infrastructure, poor electricity and water supplies, poor telecommunication networks and poor sewerage systems. However, they acknowledged that the government has embarked on several projects to develop infrastructure. It is important to note that respondents did not provide much information on government's efforts to improve the water supply.

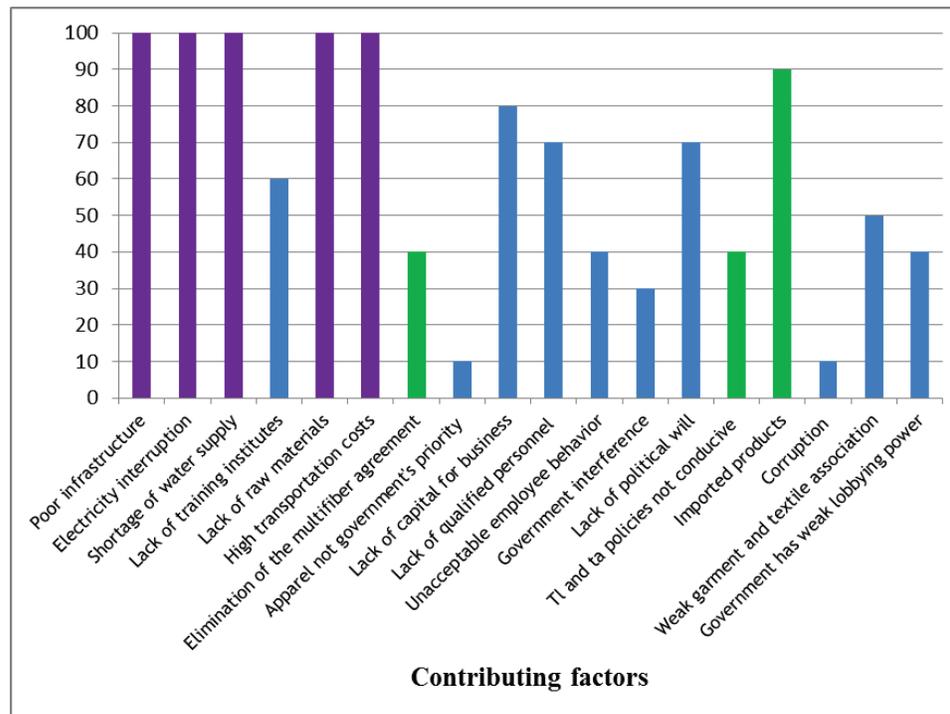


Figure 3 Percentage of respondents who identified a factor as contributing to lack of competitiveness of the Malawian apparel manufacturing industry ($n = 10$).

Demand Factors

Nakagawa et al (2009) noted that salaries in Malawi are very low and therefore most Malawians rely on cheap products such as, second hand clothing, thus, making the apparel industry a difficult business entity to enter. During data collection, all respondents ($n = 10$) reinforced observations made by Nakagawa et al (2009) that Malawi has two groups of consumers. Minority can afford new, expensive and fashionable clothing. Majority rely on second hand clothing, which is cheap and affordable.

Support and Related Industries

As of summer 2010, no industry in Malawi was producing raw materials and accessories for garment production. Respondents reported that the cotton textile and garment value chain is fragmented as indicated by RATES (2003). In terms of firm's strategy, structure and rivalry, all respondents acknowledged that the company producing for export (Company A) has no rivalry and that the domestic manufacturers are challenged with low prices of second hand clothing and cheap products from Asian countries.

Other Factors: Government and Chance Factors

Respondents observed that the government of Malawi has made strides in improving the industry by attracting foreign investors, participating in several trade agreements, and offering institutional support as shown in Figure 4. However, retention of foreign investors has been a challenge. Participation in trade agreements both within and outside Africa are

some of the strategies and policies the government of Malawi pursues to improve the apparel industry. All respondents ($n = 10$) pointed out that the Malawian apparel industry is not exporting apparel to South Africa or the US under the African Growth and Opportunity Act. Representatives of Company A stated that the company does not export its products under AGOA; the company finds its own markets. Even though trade agreements open up business opportunities for Malawian apparel manufacturers, no company is exporting under AGOA.

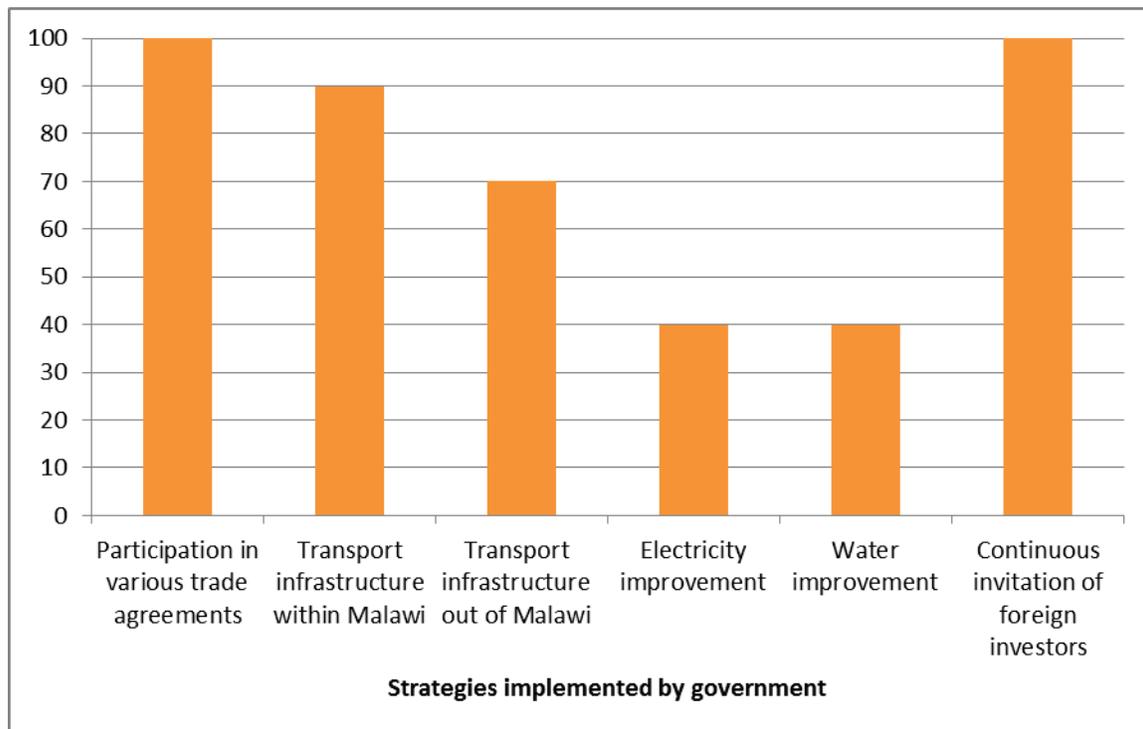


Figure 4. Percentage of respondents who identified strategies implemented by the Malawi government to improve the apparel manufacturing industry.

In terms of chance factors, respondents alluded to the fact that the Mozambique war in the 1970s destroyed the Nacala railway line, a cheapest route for transporting Malawian apparel products to ports of shipment such as Durban in South Africa. Based on the Malawian apparel model, results of this study show that the apparel manufacturing industry in Malawi does not have sufficient human and non-human resources that determine an industry's competitiveness.

Suggestions Derived from In-Depth Interviews

Suggestions for improvement as presented by the respondents ($n = 9$) who participated in the interviews showed that the government of Malawi has a major role to play in the improvement of the apparel manufacturing industry as shown in Table 2. The respondents gave multiple responses to the question "What should be done to improve the apparel manufacturing industry?" It is interesting to note high percentages in regard to certain suggestions, such as, continued invitation of foreign investors, improving domestic industry,

encouraging domestic investors to export, Malawi's participation in trade agreements within SSA, and reviving the cotton textile and garment value chain.

Variable	Respondents
Need for a Malawian representative at the World Trade Organization (WTO)	3
Diversification	4
Lobby for appropriate trade agreement and trade liberalization policies	7
Improve domestic industry and encourage domestic investors to export	8
Apparel industry to learn from Chinese investors	2
Government must continue inviting foreign investors	9
Need for political will	7
Malawi should participate in trade agreements within Sub-Saharan Africa	8
Government must facilitate reduction of interest rates in lending institutions	7
Revive cotton textile and garment value chain and encourage domestic production	8
Create training institutions	6

(n = 9)

Table 2 Suggestions from in-depth oral interviews for further apparel manufacturing industry improvement

In sum, the apparel manufacturing industry producing for export is growing very slowly and is uncompetitive but it has potential for growth. The domestic challenges were the major contributory factors to the slow growth of the industry. Respondents acknowledged government's commitment to improving the industry through several initiatives such as, inviting foreign investors, participation in several trade agreements and improving transport infrastructure. Respondents also suggested several strategies for further improvement of the industry, such as, the need for political will, government to continue inviting foreign investors, reviving the cotton, textile and garment value chain, creating training institutes and many others. In addition, the Malawian Competitive Advantage Model showed that Malawi does not fully satisfy any of the determinants of Porter's Competitive Advantage Theory. Chapter 5 discusses results of this study in detail isolating similarities and differences between results of the study and the reviewed literature.

Limitations of the study

Even though the reviewed literature identified eight companies producing apparel for export under the Export Processing Zone status, results of this study revealed that there were only six companies producing apparel and out of the six only one company was still exporting. Therefore, data from this company could not be generalised to all apparel manufacturing companies in Malawi. Second, the sample size did not have adequate numbers for different

categories of employees in the apparel manufacturing sector for the same reason. Therefore, this study lacks information on working conditions and views of employees in the apparel manufacturing sector. The small sample size and lack of employee information may have affected the validity and reliability of the results of the study. Third, this study focused on apparel manufacturing companies involved in international trade only. Therefore, results of this study could not be generalised to all apparel manufacturing companies. Lastly, this study examined Malawi's participation in trade agreements outside Sub-Saharan Africa. Any inferences drawn in this study are applicable to the WTO and trade agreements outside Sub-Saharan Africa, particularly, AGOA and EPZs and would therefore not be generalised to all trade agreements.

Conclusion

During the planning phase, this study aimed at collecting data from three levels of the apparel manufacturing industry. Data used in this study were from policy makers' and managerial levels. Future studies may consider doing an in-depth examination of the working conditions. In addition, the owners of the apparel manufacturing industry indicated that their needs were not represented when the government negotiates for foreign investment in the industry. Perhaps there is need to revive the Garment and Textile Manufacturers Association of Malawi (GTAM) to act as a mouthpiece for the industry. Since retention of foreign investors in the industry is challenging, the government might consider encouraging domestic investors to export apparel to existing international markets.

Considering that the textile value chain in Malawi is still fragmented, and that some neighbouring countries like Zambia have several textile manufacturing companies, the government of Malawi might consider negotiating with the government of Zambia to produce yarn and fabric from cotton grown in Malawi, and send the products back to Malawi for use in the industry. Since this study mostly focused on the World Trade Organization (WTO), Export Processing Zones (EPZs) and the African Growth Opportunity Act (AGOA), future studies may target trade agreements within Sub-Saharan Africa. Furthermore, the apparel manufacturing industry in Malawi is classified into two categories. One category produces apparel for domestic consumption and another for export. This study only dealt with companies that produce apparel for export. Therefore, companies that produce apparel for domestic consumption are another area for future research. One other important factor for future research is looking at the possibility of other companies in the Export Processing Zones merging with the apparel and textile industry to create better and stronger business opportunities. Alternatively, the textile and apparel industry could merge to restructure and strengthen the industries' strategies, operations, and market processes, thus eliminating the shortcomings of individual companies. Besides the industries joining forces, they could work with universities in Malawi to explore ways in which the industry's needs could be met through collaborative research and resource sharing.

Biography

Miriam Kumwenda was a Master's Graduate student in Apparel Design and Production, Oklahoma State University. Miriam is a lecturer in Clothing and Textiles at Chancellor College, a constituent of the University of Malawi. The college works hand in hand with the Malawian Textile and Apparel manufacturing industries to identify challenges facing the industry and explore ways of addressing those challenges.

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Reviving creativity and innovation for a sustainable future: the one hour dress

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Abstract

This study, a combination of historical research and creative scholarship, centred on the “One Hour Dress,” a promotional effort put forward by the Woman’s Institute of Domestic Arts and Sciences (WI) between 1923 and 1925. Successful marketing of the One Hour Dress demonstrations called attention to Home Economics subjects, supported local businesses, and motivated women to seek additional knowledge of dress and clothing construction skills. Revived for the present, the One Hour Dress was constructed to explore its viability today. The One Hour Dress and its promotion can serve as a template to increase visibility and impact. Home Economists could seek partners in innovative ways and work with them on exciting projects, calling attention to the concrete improvements we make in quality of life. Through examples such as this, we can adapt past successes to create a sustainable future and enhance human capital.

Introduction

As Home Economists, one of our goals is to “provide opportunities through practice, research and professional sharing that lead to improving the quality of everyday life for individuals, families and households worldwide” (IFHE, 2011). For more than 100 years, we have been continually innovative and effective in this mission. The purpose of this study was to explore past methods and techniques and examine the feasibility of employing them to inspire future efforts for learning and refining essential knowledge and skills.

This research, a combination of historical study and creative scholarship, centred on the “One Hour Dress,” a promotional effort put forward by the Woman’s Institute of Domestic Arts and Sciences (WI) between 1923 and 1925. Successful marketing of the One Hour Dress demonstrations called attention to Home Economics subjects, supported local businesses, and motivated women to seek additional knowledge of dress and clothing construction skills. Through examples such as this, we can revive past successes to create a sustainable future and enhance human capital.

Home study

A division of the International Correspondence Schools in Scranton, Pennsylvania USA, the WI offered three courses of study by mail in Sewing, Dressmaking, and Tailoring; Millinery; and Cookery. It enrolled its first student in February 1916 and “membership grew as if by magic” (Harmeling, 1926, p. 8). By September 1921, the school had 125,000 students in every USA state and 38 countries. They were enrolling 3,000 to 5,000 new students each month (Nutall, 1928; “Percentage Certificate,” 1928; “Woman’s Institute,” 1921).

Mary Brooks Picken (1886-1981), author of the dressmaking course, Vice President, and Director of Instruction oversaw 200 instructors and more than 300 clerical assistants in a state-of-the-art \$1,000,000 building constructed with one year's profits (Sumner, 1952). The WI was the "the most extensive project in home study of the household arts that had been undertaken up to that time in the United States" (International Correspondence Schools, 1951; Picken, 1964). Mrs Picken asserted "such a remarkable growth can be due to only one cause--[that it] is supplying a great human need" (Dunn & Kashuba, 2007 p. 66; "Woman's Institute," 1921, p. 161).

Initially, the three courses of study were given equal billing, but in the first two years, it became apparent that the bulk of inquiries were for the clothing programs. "Requests poured in by the thousands and tens of thousands for information about the courses in dressmaking and designing" (Sumner, 1952, p. 74). Vice President of Advertising G. Lynn Sumner (1885-1952) provided an explanation.

A woman may be perfectly willing to admit her inability to make a dress that she would wear before the critical eyes of her friends, but she believes she is quite able to prepare three meals a day that will reasonably satisfy her family at home (Sumner, 1952, p. 74).

The millinery and cookery courses continued to be offered, but WI advertising and promotion increasingly focused on dressmaking.

Mary Brooks Picken (see Figure 1), a Home Economist in business joined the American Home Economics Association (AHEA) in 1921 and was a member for at least 50 years ("50-Year Membership," 1971). She wrote at least four articles for the *Journal of Home Economics*, offered workshops for professionals, and lectured at universities (Flashes, 1954; News Notes, 1929, 1944, 1961; Picken, 1929, 1932, 1932, 1941; Study of Fashion, 1930; Work and Clothing Classes, 1933). Mrs. Picken was a member of the Home Economics in Business Division of the AHEA and contributed to "Home is What You Make It," a radio series and book produced by the AHEA during World War II.



Figure 1 Mary Brooks Picken at Sewing Machine Surrounded by Woman's Institute Instructors. (c. 1924). Collection of the author.

Woman's Institute

Through extensive advertising and promotional materials such as *Dressmaking Made Easy*, the WI was making its presence known.

The Institute was actually giving instruction to more women and girls than had ever been taught at any one time by any one school, and its mass influence was making itself felt in every community throughout the United States. The Institute's full pages of fiction-type advertising were running in all the leading women's magazines, and judging from the 50,000 inquiries a month that came pouring in, a large part of the female population of the country was reading them (Sumner, 1952, p. 93).

The AHEA also noticed the work of the school. Woman's Institute texts and methods were reviewed in the JHE, adopted by the Canadian government for Home Economics courses and included in the Home Economics curriculum of some public schools in the United States (Denny, 1924; Denver Public Schools, 1925a, 1925b; "A Guide for Home Economics, Kansas Secondary Schools," 1949; "New Domestic Arts," 1921). The connection between the WI and Home Economics was further demonstrated when Mary E. Sweeney, AHEA President spoke on the topic of "Home Training" at the new building dedication ("Fine Speakers," 1921; "Governor Sproul," 1921; "Thousands at Exercises," 1921; "Woman's Institute," 1921).

WI courses were conducted entirely by mail. As head of advertising, Sumner (1952) remembered, "we were always looking for ways to increase its fame and its enrolment, and with 200,000 students to talk about, we felt we had something that might be capitalised in a new way" (p. 93). "The idea that kept recurring to us was that in teaching that woman to sew, we had helped to create a potential customer for a sewing machine, fabrics, patterns, thread, buttons, slide fasteners, and an infinite variety of sewing supplies and accessories" (Sumner, 1952, p. 93). He computed the impact.

We found that if those 200,000 women spent only \$10 a year for materials, a sum which they might easily spend on a single dress, it meant sales of \$2,000,000 a year to the stores they patronized. If the average student spent \$50 a year, which was more likely, it meant sales of \$10,000,000. Our records showed that the average age of students at the time of enrolment was 27. If they continued to buy piece goods and accessories at the rate of \$50 a year for 20 years, their purchases meant \$200,000,000 in business to their home town merchants. In creating such a potential purchasing power, we felt we had something to capitalize with retail stores (Sumner, 1952, p. 93).

The Woman's Institute conducted "a survey of what was happening in the piece-goods business" (Sumner, 1952, p. 93). The results of a questionnaire received from 189 department store executives were reported in an article in the *New York Times* on June 24, 1923, which began, "Women, so to speak, have jumped from short dresses into a shortage of dressmakers" (p. E7). It included an interview with David N. Mosessoehn, Executive Chairman of the Associated Dress Industries, quoting him,

In analysing this question, it is apparent that there is a real reason for an increasing use of ready-made dresses and a decreasing desire on the part of the average woman to make her own clothes or have them made by a local dressmaker...When it is completed it just screams 'home-made,' and does not bear that chic, natty air of a garment designed, cut and tailored by experience craftsmen and artists ("Are Dressmakers Becoming Fewer?," 1923, p. E7).

Sales of ready-to-wear clothing through department stores and mail-order houses were growing sharply in the 1920s. The article attributed this growth to advantages in both style and cost. "Even the simple house dress...is available at so low a price and in such snappy, attractive styles that every woman would buy one rather than make it herself" ("Are Dressmakers," 1923, p. E7). The author explained,

The change that has taken place in recent years in which the home dressmaker is finding her services less in demand is a change due to the development of the science of dressmaking, a desire on the part of our women to get the best styles made up in an attractive manner, and logical but extensive advertising by manufacturers and department stores throughout the country ("Are Dressmakers," 1923, p. E7).

What the WI survey found in 1923, Home Economists had been reporting for at least seven years. In the August 1916 *Journal of Home Economics*, Charlotte Gibbs Baker concluded, "For the busy woman who wants simple garments of good material there is little saving in making them at home" (p. 450). Two years later, Janet G. Cation (1918) of Iowa State College reported, "Although we proved that wool dresses that cost about \$15 ready made, could be made for \$7, several of the girls were not willing to give up the ready made ones. They liked the spick span tailored look, and thought a home made dress looked the part" (p. 442).

Of the survey, Lynn Sumner (1952) said, "The result confirmed our belief. The day of the professional dressmaker was largely over" (p. 93). This, too, was already apparent to Home Economists. A February 1917 *JHE* article read in part, "Except for plain mending and renovation, home dressmaking as such no longer exists" (Murtland, p. 51). In contrast, there was another phenomenon noted in the *New York Times*, "Recent reports tend to show that the dress-fabric departments of stores all over the country have been doing a big business over the counter" ("Are Dressmakers," 1923, p. E7). Mr. Sumner (1952) confirmed, "Department stores everywhere were intensely interested in encouraging women to sew and make their own clothes" (p. 93). He thought, "...by rendering an instruction service, we were creating piece-goods buyers. Merchants all over the country were eagerly looking for piece-goods buyers, but there was no logical contact between us...What we needed was an idea that would make co-operation profitable to us both" (p. 94).

Motivations for the popularity of dressmaking courses were partially explained in the *Journal of Home Economics*.

The woman who attends dressmaking courses in the evening schools or in part-time courses does so because she wishes to learn methods by which she

can produce clothing of as good style and attractiveness as her neighbors and friends buy in the store, or secure from the dressmaker. She also wishes to learn time-saving methods in her work (Murtland, 1917, p. 51).

One Hour Dress

The perfect solution, which connected “good style” and “time-saving” was an innovation of Mary Brooks Picken.

Mrs. Picken conducted in the instruction department of the Institute a practical dressmaking shop, where skilled dressmakers were constantly engaged in experimental work. On this particular afternoon she came into my office with one of the girls she used as a model,” she exclaimed, “We made it since lunch! We made it in an hour. It’s a one-hour dress!’ ‘A one-hour dress!’ The moment the phrase was spoken we both knew that we had the idea we had been looking for... (Sumner, 1952, p. 94).

Mary, Lynn, and their teams began preparing a booklet which showed pictures and “simple directions” about how to make the One Hour dress from three yards (2.74 m) of fabric without a pattern. The process was tested several times with satisfactory results (Sumner, 1952).



Figure 2 Cover of *The One Hour Dress and How to Make It* (Picken, 1923).

Written by Mrs. Picken, the booklet *The One Hour Dress and How to Make It* was published in early 1923 (see Figure 2). The dress was described as: “A kimono waist cut lengthwise of the material, and a straight skirt that has a selvage edge at the bottom instead of a hem and as a result is crosswise of the material, constitute this one hour dress. The neck, sleeve, and

pocket edges are bound. A narrow sash holds the dress in place at the waist line. A pocket on each side serves also as a drapery for the skirt” (Picken, 1923, p. 4). It was easy to make and suited to current fashions (Picken, 1923).

Readers were assured that the dress only required four measurements, three seams, five bound edges, and a sash. They were advised “To make a dress in an hour, two things are essential: first, to know what you are going to do; and second, to do this in a systematic way, going from one operation to the next with confident quickness” (Picken, 1923, p. 4). The dress offered “many possibilities of variation” and was “especially desirable for children” (Picken, 1923).

With an overarching theme to attract students to the Woman’s Institute dressmaking courses, the back cover of the *One Hour Dress* booklet was a sales appeal. It read in part,

The ‘One Hour Dress’ was designed by the Woman’s Institute as proof that with proper instructions you really can make pretty, becoming dresses at wonderful savings, right at home, no matter how little spare time you may have. It is just an example of the amazingly simple methods used in the Woman’s Institute New Course in Dressmaking and Designing (Picken, 1923, p. 16).

Once the instructional materials were completed, Sumner (1952) thought about marketing.

Could there possibly be a better place to make that demonstration than in department stores, with hundreds of women watching? Could there possibly be a better way to bring potential piece-goods buyers into the store and at the same time convince women who were thinking about taking the Institute’s dressmaking course that by taking it, they really could learn to sew?...Then we developed a complete plan for a department store—a plan for a Home Sewing Week with a demonstration of making the One-Hour Dress as the feature (pp. 94, 95).

The test was carried out in Brooklyn, New York’s Abraham & Straus Department Store in early 1923 (Sumner, 1952). “We offered the services of the best dressmaker from the Institute’s model shop to do the demonstrations, and we offered to supply copies of the instruction booklet to all women who attended” (Sumner, 1952, p. 95). Always looking for a way to enhance marketing, they tapped into the enrolment records by sending a personalised invitation to every WI student and known prospective student in the area. For its part, Abraham & Straus promoted the “affair” through newspaper advertising and window displays (Sumner, 1952). (See Figure 3.)

The demonstrations of making the One-Hour Dress were staged twice each day at ten o’clock and two on a platform set up in the piece-goods department. An important feature of the event was the timing of the making of the dress. A large clock on stage in full view of the audience was started on the hour as the dressmaker began her work. An announcer from the

Institute's instruction staff described each operation as she proceeded. Her progress became a race against time, with the audience excitedly watching the dressmaker and the clock. The longest time taken to make any dress during the week was 55 minutes; the shortest, 47 (Sumner, 1952, p. 95).



Figure 3 Advertisement for Demonstration of the One Hour Dress. ("It's Home Dressmaking Week!, 1923).

A success for both Abraham & Straus and the WI, the demonstrations drew record crowds to the piece-goods department and were reported in both the local newspapers and *Women's Wear Daily*, "and the plan was thus brought to the attention of stores throughout the country" (Sumner, 1952, p. 96). The second demonstration was at Kaufmann's Department Store in Pittsburgh, PA. "This one was staged in the store's auditorium. More than 10,000 women attended the 12 demonstrations during the week. The promotion was attracting so many customers that it was continued for three days into the following week, with an attendance of 2,000 more" (Sumner, 1952, p. 96). Afterwards, the merchandise manager of Kaufmann's commented, "We practically tripled our business of a year ago. Right now we are planning on dates for fall and spring" (Sumner, 1952, p. 96).

The event generated a great amount of publicity for the Woman's Institute.

Many women, after seeing the demonstration, were convinced that it would be easy to make their own clothes when they had had proper instruction. At Kaufmann's more than one hundred women, most of them among our invited prospective students, took advantage of the opportunity to enrol on the spot. Thus we came away from this demonstration with over \$5,000 in sales and the promises of many prospects to enrol later (Sumner, 1952, p. 96).

Promoting the One Hour Dress

The major launch of the One Hour Dress promotion occurred at the second USA Merchandise Fair in New York City from July 23 to August 3, 1923. Located on the main floor of the Grand Central Palace, the Woman's Institute booth included a stage and big clock. Mary Brooks Picken's instructors "cut, basted, and stitched" the dress twice a day ("Buyers Still Busy," 1923; "Fair Here," 1923; "Mrs. Hylan," 1923). Three days into the fair, "despite a sore

finger,” Lenore McCormack set a record for making the One Hour Dress in 34 minutes (“Buyers,” 1923; “Fair Here,” 1923; “Mrs. Hylan,” 1923; Picken, 1924; “Still Bigger,” 1923). The *New York Times* reported a “crowd gathered about the booth...and there was handclapping when she had finished” (Buyers,” 1923, 24).

Newspaper articles provided information for retailers interested in bringing the program to their stores. “The ‘One-hour dress’ has been featured by firms who use it to help sell new material. It is a simple model which can be varied to some extent, and can be made by any woman in an hour.” It continued, “Many department stores have girls who make these dresses while customers wait for them and have been used to increase sales. Many women buyers have expressed the desire to watch and study the simple process of manufacture...They can be adapted for almost any sort of wear by varying the cut somewhat” (“Buyers,” 1923, p. 24; “Fair Here,” 1923, p. 16).

On Thursday, August 2, Miss McCormack repeated the process “in response to many requests from visitors.” This time an “evening dress of gold and green metallic cloth was completed in 44 minutes” (“Buyers,” 1923, p. 24; “Still Bigger,” 1923, p. 23). The demonstration was reported throughout the country. One paper stated that the dress “can be made by any woman who is ordinarily skillful with a needle in from 45 minutes to one hour” (“National Merchandise Fair,” 1923, p. 8). But it was not without criticism. The *New York Times* interviewed Mme. Gisela Bennati, a dressmaker from Chicago, “a guest at the booth of the Woman’s Institute” who said, “The reason Miss McCormack can make this dress in an hour is that she has studied every step and knows just what to do” (“Still Bigger,” 1923, p. 23).

Later that month and throughout 1923, the One Hour Dress was demonstrated in many prominent USA department stores (“It’s Home Dressmaking Week,” 1923; “One Hour Dress Creates Sensation,” 1923; “The One Hour Dress is Drawing the Crowds,” 1923; “The One Hour Dress Has Taken Hartford By Storm,” 1923). Most stores organised “Home Dressmaking Week” with advertisements over the course of several days in each city’s main newspapers. These featured an image of the One Hour dress and an illustration of the \$1,000,000 Woman’s Institute building. Copy read,

The several seamstresses, instructors from the Woman’s Institute of Domestic Sciences and Arts [sic], of Scranton, Pa., will be glad to give all the information about home sewing that you may ask. For instance: What line is your most graceful one?...Is it possible to fit the back of your own waist? In short, every question regarding your own personal appearance and clothes will be answered intelligently and without cost to you (“Learn How to Make,” 1923; “The Talk of the Community,” 1923).

Demonstrations included samples of the One Hour Dress, made up in fabrics available in each retail store. Attendees received a copy of the instruction booklet and were aided in choice of fabrics and trims. Along with free copies of *The One Hour Dress and How to Make It*, visitors received the *Guide to Correct and Becoming Dress* (“Learn How to Make,” 1923; “Talk of the Community,” 1923). The *Guide*, “an attractive booklet setting forth in an authoritative manner the style of dress, hat, wraps, shoes, gloves and dress accessories the well-dressed

woman should wear on every occasion” was gleaned from the WI lesson plans and the *Secrets of Distinctive Dress*, a stand-alone book published by Mrs. Picken in 1918 (“Creates Sensation,” 1923; “Home Sewing Week,” 1923; “How to Make the One Hour Dress,” 1923 “The One Hour Dress,” 1923).

Booklets were stamped with the name of the retailer and store windows were “attractively decorated in honor of the event.” An advertisement read, “One display presents graphically the steps taken in making the dress and indicates the time required for each operation. Another display, a reproduction of an oil painting in full color, shows the completed garment as it appeared on Mae Marsh, the famous screen star, when her likeness was painted by W. G. Kriehoff, a noted American artist...” (“Creates Sensation,” 1923, p. 14).

Some advertisements recounted incredible scenes. For example, “Hundreds of interested women crowded the sidewalks in front of Peck’s store yesterday to see the display of the sensational ‘One Hour Dress.’ Hundreds more congested the aisles inside to examine the garment more closely, and to learn by what magic it is possible to make a dress in sixty minutes without the sacrifice of beauty, style, and distinction” (“Creates Sensation,” 1923, p. 14). Another reported, “Already more than 300 women in Hartford are learning dressmaking by this fascinating new plan. These young women welcome the opportunity to talk to you about your personal problems of dress. Come in and meet them and let them help you with your home sewing” (“Drawing the Crowds,” 1923). A September 1923 ad boasted, “The One Hour Dress Has Taken Hartford By Storm!” It read in part, “In four short days it has become the most talked-of success in town. And no wonder. For it presents the new styles for Fall in charming simplicity, yet it can be made in an hour in your choice of material and in any one of a dozen pleasing variations” (p. 9).

The success of the promotion led to an updated booklet, written by Mary Brooks Picken and produced by the Woman’s Institute, titled *The One-Hour Dress with Seventeen New Designs for 1924*. Inside was a letter from J. H. Nixon, Business Manager of the National Merchandise Fair who certified that Miss Lenore McCormack made the One Hour Dress in 34 minutes (p. 1). It included an image of “Mary Brooks Picken wearing a One Hour Dress (see Figure 4) and an essay, “Making a Dress in an Hour” by Mrs. Picken. It began,

A smart, up-to-the-minute dress cut out, completely made, all ready to put on within an hour! You may receive a phone call at one o’clock inviting you to a little impromptu gathering of friends at three and you can go, if you wish, wearing a dainty new frock made in the time you would ordinarily spend wondering what to wear. Such is the delight you can find in making your own clothes now that is easily possible to make an attractive becoming dress in an hour (Picken, 1924, p. 2).

A postcard for store visitors to inquire about Woman’s Institute courses was slipped inside the booklet (Sumner, 1952).



Figure 4 Mary Brooks Picken in the One Hour Dress. (Picken, 1924, p. 1).

Expansion and success of the program

The One-Hour Dress demonstrations provided an increase in retail sales since several stores held another round, some only six months after their first one (“Auditorium,” 1924; “Auditorium (Eleventh Floor),” 1924; “Home Dressmaking Week,” 1924; “In the Auditorium,” 1924; “One Hour Dress Demonstration,” 1924; “The One Hour Dress Demonstration,” 1924). Over time, the promotion changed from offering the free booklet to “all visitors” to a booklet for “every woman purchasing material for a dress in our Dress Goods Departments this week...” (“Home Dressmaking Week,” 1924, p. 7). It may have been too costly for retailers to provide booklets to “hundreds of interested” women.

Some of the 1924 promotions included the added service of dresses made to order. Advertisements of this type read, “During the demonstration we will make to your measure any dress selected from the 17 models, fit and workmanship guaranteed, for \$7.00 above the cost of the material” (“Home Dressmaking Week,” 1924). In his book, *How I Learned the Secrets of Success in Advertising* (1952), Sumner recounted an instance when this promotion backfired.

In Bridgeport, Connecticut, a store completely underestimated the power of the promotion. They wrote us that they were going to announce in their advertising that if a woman would buy the material for a dress, they would make it for her...We advised them not to do it, but they went ahead...It took two dressmakers three weeks to make up the materials purchased (p. 98).

Mary Brooks Picken personally demonstrated the One Hour Dress at the Davis Store in Chicago on May 12, 1924 ("Special Demonstration," 1924). The event, advertised in the *Chicago Tribune*, was clearly designed to elevate Davis' fabric sales.

All the materials used for demonstration purposes come direct from our own Davis mills. This is an event with a special purpose. First, to show you how to make a dress in a few minutes time. Second, to acquaint you with the Davis yard goods department that can be reached by all elevated trains direct to our yard goods, entrance. Third, to see how we make it possible for you to save money on your sewing materials at all time ("Special Demonstration," 1924, p. 15).

In 1924, The Woman's Institute began offering the program "on a self-operated basis to a list of selected stores" with a promise of exclusivity. A letter sent to "the most desirable store in each city," resulted in inquiries from more than 1,000 stores (Sumner, 1952, p. 98). Hiring local dressmakers to practice the One Hour Dress technique ahead of time, retailers presented them making it in the piece-goods department or the store window for a week at a time (Sumner, 1952). The Woman's Institute provided advertising copy, publicity releases, suggestions for window displays, and "a complete plan for putting on the demonstration." Instruction booklets were provided to the store at a cost per hundred with an inquiry card inside (Sumner, 1952, p. 98).

"Within three months after this plan was announced it was put on independently by more than 200 stores in 41 states" (Sumner, 1952, p. 98; "The One-Hour Dress," 1924a; "Come In and Learn," 1924; "The One-Hour Dress," 1924b; "Saturday," 1924; "This is the Last Day," 1924). It increased fabric sales and brought attention (and students) to the Woman's Institute. At one store, 2,040 women visited the piece-goods department in just four days (Sumner, 1952).

Derivations of the One Hour Dress booklets were also used to promote fabrics, without the demonstration. For example, a March 27, 1924 advertisement offered the booklet, "Two Smart Frocks of Everfast and How to Make Them in an Afternoon," with fabric sales ("Free," 1924a, 1924b; "Free With Each Dress Length," 1924). The booklet "contains complete instructions for making two smart summer frocks, with suggestions for varying them in many charming ways. They were designed by Mary Brooks Picken, Director of Instruction of the Woman's Institute, and are delightfully easy to make" ("Free," 1924a, p. 4).

But, "many big city stores, having heard and read about the shows at Abraham and Straus and Kaufmann's, wanted the original production" (Sumner, 1952, p. 98). These prominent retailers included Rich's in Atlanta where it was reported that "several hundred women...thronged to the second floor" and the City of Paris store in San Francisco ("Makes Dress in Less than Hour," n.d.; "Shown at Rich's," 1924). The San Francisco retailer "closed the week with an evening mass-meeting performance in the Civic Auditorium" (Sumner, 1952, p. 100). A telegram from the store president stated in part, "Ten thousand people listened with intense interest...From reports of all it was the biggest thing put over by any dry goods

store” (Sumner, 1952, p. 100). City of Paris reported a 105% increase in piece-good sales from the same week the year before (Sumner, 1952).

An updated booklet, *The One Hour Dress: 21 New Designs with Complete Instructions for Making* was produced in 1925. The dress was demonstrated at least twice in the spring of that year, but there is no evidence that the One Hour Dress was presented after April 1925 (“One-Hour Dress Demonstration,” 1925; “See a Dress,” 1925).

The One Hour Dress Today

It is clear from its history that the phenomenon of the One-Hour dress led many women to seek further knowledge of dressmaking in the 1920s. In addition to historical research, the purpose of this study was to examine the feasibility of using this method to encourage and teach sewing today.

The 1923 booklet, *The One Hour Dress and How to Make It*, was used for this phase of the research (Picken, 1923). The statement, “To make a dress in an hour, two things are essential: first, to know what you are going to do; and second, to do this in a systematic way, going from one operation to the next with confident quickness,” was followed with the booklet read from cover to cover three times prior to beginning (Picken, 1923, p. 4).

Under “Materials Required,” the booklet included, “Any medium firm material that does not have a definite up and down, such as stripes, is suitable for this type of dress” (Picken, 1923, p. 5). A plain weave printed cotton was selected to meet these requirements as well as update to contemporary tastes. Using a dress form with a 38 in. (96.5 cm) bust, directions stated that 40-in. (1.0 m) wide material was appropriate. This was not available in local outlets, so 45 in. (1.1 m) wide fabric was used. Directions called for 3 to 3½ yards (3.2 m). Three and one half yards were purchased and 18 in. (46.0 cm) were left at the end of the project. Requirements included “from 2¼ to 2½ yards of binding” (2.1-2.3 m). A three yard (2.7 m) package of “bias tape/extra wide double/fold” was purchased. One spool of thread completed the materials. The sewing machine was threaded before beginning.

Table 1 Measurements and Notes for the One Hour Dress.

Name	Definition	Notes	Measurement
Length of the dress	From the shoulder at the neck to the hem length	Add 1½ to 2 in. (3.8-5.1 cm) extra at the bottom over the desired finished length to accommodate blousing with sash.	45 in. (1.1 m); 46½ in. (1.2 m) allowing for blousing
Length-of-blouse	From a point 3 to 6 in. (7.6-15.2 cm) below normal waistline over shoulder at neck and down the back to waistline.	To align with current styles, it was decided to make the bodice fall three inches below waistline.	41 in. (1.0 m)—3 in. (7.6 cm) below normal waistline
Hip	At the fullest part of hips		39 in. (1.0 m)
Armhole	Around the arm at the shoulder, holding the tape slightly loose		18 in. (45.7 cm)

Four measurements were taken as seen in Table 1. Measuring took approximately 10 minutes. The 11 steps in making the One Hour Dress and approximate times to complete are seen in Table 2. Directions were followed and some adjustments made as indicated Table 2 notes. For example, cutting out and attaching the pockets proved to be a challenge. This may have been because of the extra width in the fabric and because the pockets are external to the side seams, which is not a common feature of contemporary clothing. Also, attaching the skirt to bodice incorporating the pockets was somewhat difficult, especially in the turn where the pockets meet the dress. These seams had to be done three times to achieve a satisfactory result.

Table 2 Steps, Notes, and Times for Making the One Hour Dress.

Step	Notes	Time
Measuring the Waist Length	Calculated at $\frac{1}{4}$ hip measurement plus $1\frac{1}{2}$ in. (3.8 cm); 11 inches (27.9 cm)	15 minutes
Dividing the Material	Instructions provided for tearing or cutting the material. Because tearing sometimes interferes with straight of grain, cutting was used.	
Cutting Out the Skirt	Imbedded in the directions was a necessary calculation which was "length of skirt." This was done by subtracting: Length of dress minus $\frac{1}{2}$ length of blouse. Since the fabric was wider than the 40 in. (1.0 m) recommended, a wider belt was allowed. The belt was made from a 6 in. (15.2 cm) wide length of fabric.	
Cutting Out the Waist	After the dress was completed, it was apparent that the sleeves were 5 in. (12.7 cm) longer than the design as the fabric was 45 in (1.1 m wide). Future constructions of the dress could include cutting off this excess if a shorter sleeve style is desired.	
Binding the Sleeves	Directions called for pinning on the binding, but this resulted in slipping and an uneven appearance, so basting the binding before sewing on the machine was done.	One hour
Binding the Neck		
Seaming the Skirt	As the directions did not include seam allowance width, $\frac{1}{2}$ in. (1.3 cm) was used on all seams.	One hour
Making the Pocket	Pocket pieces needed to be cut to 12 in. by 10 in. (30.5 by 25.4 cm) to fit.	
Seaming the Dress	The directions/diagrams took time to understand.	Two hours
Making the Belt	Finished belt was $2\frac{1}{2}$ in. (6.4 cm) wide.	
Finishing and Pressing	Basting thread was removed.	

Therefore, with the measurements taken ahead of time, the One Hour Dress took four hours to complete. The finished dress is seen in Figure 5. At the onset, it was assumed that it would take longer to construct the first time, and with practice, the production time could definitely be shortened. This includes a better understanding of the pocket and side seam

construction. Observer Mme. Gisela Bennati was correct in saying, “The reason Miss McCormack can make this dress in an hour is that she has studied every step and knows just what to do” (“Still Bigger Fair,” 1923, p. 23).

As advertised, the finished product was comfortable and nice looking. Prominent pockets at the hips are useful, but this style may not suit contemporary tastes. Modifications, published in 1924 and 1925, from the original pattern included pleats or gathers rather than pockets, which add a more updated dimension. Future research will include further modifications with an eye toward current fashion trends in fabric and silhouette.



Figure 5 One Hour Dress. Front and Back. (2011). Collection of the author.

Nonetheless, this method proved to be successful in creating an attractive and wearable dress. Even at four hours, it is a short time and simple construction, making the One Hour Dress an interesting project for teaching people to sew. In recent years, Bramcost Press has reproduced the 1924 and 1925 One Hour booklets in spiral bound form (Picken, 2007, 2008a, 2008b, 2008c). Using wider fabric would result in long sleeves with adequate yardage for

additional skirt length. This may better suit those who desire clothing that is more “covered up.”

In conclusion, this study reveals the impact of marketing and promotion in calling attention to Home Economics subjects while supporting local businesses. It can serve as a template to increase our visibility and impact. One Hour Dress demonstrations were heavily advertised “events.” The WI determined what helped local retailers (to sell more fabric), while helping themselves (to increase enrolment). This win-win partnership was of benefit to both. Home Economists could take this example to seek partners in new ways and collaborate on exciting projects, thus calling attention to the concrete improvements we make in quality of life. By using creative problem-solving skills and innovative ideas like the One Hour Dress, Home Economics professionals can revive past examples of successful outreach, encouraging a sustainable future.

Biography

Dr Catherine Amoroso Leslie is an Associate Professor in The Fashion School at Kent State University in Kent, Ohio, U.S.A. She has published in the International Journal of Consumer Studies; International Journal of Fashion Design, Technology and Education; the Family and Consumer Science Research Journal, the Journal of Family and Consumer Sciences, Consumer Sciences Today, and Human Perspectives on Sustainable Future. Her first book, Needlework through History: An Encyclopedia was released in April 2007. Dr. Leslie is currently working on a second book, a biography of the pioneer sewing educator and fashion expert, Mary Brooks Picken (1889-1981). E-mail: cleslie1@kent.edu

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Functions of Ethnic Dress of the Mau Ogiek People, Kenya

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Abstract

When the social and behavioural sciences were being established at the turn of the 20th century, one of the first questions to interest anthropologists and psychologists was, Why do people wear clothes? That is, what are the functions of dress? Many studies on dress have focused on the western style dress, with little attention being given to African ethnic dress. This paper discusses the functions of the Mau Ogiek's ethnic dress. The study adopted a qualitative approach using hermeneutic research design. The data were collected by in-depth key-consultant interview and focus group discussion, augmented by photography and observation. The data were collected from the museum collection, the people's extant dress and publications. The pre-existing dress was worn for the traditional functions of protection, adornment, modesty, immodesty, in addition to identity, medical therapy, compensation, to perform rituals and secure dress. The post-existing dress serves the already stated functions as well as economic, educational, non-verbal communication, enculturation, daily wear, exchange of gifts, provide privacy, shape the body, entertainment and for counting and blessing. The documentation of the dress has provided a cross-cultural point of view on the universal theories and practices of dress and adapting the same to an African ethnic dress.

Keywords: Dress, Mau Ogiek people, Pre-existing dress.

Note: All figures appear at the end of this paper on page 240 including examples of *oguriet op inderit*, *mwenigg op itig* and *taet*; *menegupet*; *rungut op metit* and *rotwetop chok*; *morogiit* and *motoget*; *chepkuleit*, *angeet* and *ngotiot*; girl-initiate in *gelteet*; *lepele*; boy-initiates in girls' dress, *kauya* and *leginjus*; *mwenigg ingongonoit*, *gariig op itig*

Introduction

The Mau Ogiek people are an ethnic minority who are forest-dwelling hunters and gatherers who inhabit and claim the Mau Forest Complex in Kenya their ancestral land (Ng'ang'a, 2006). The term Ogiek means "caretaker of all" plants and animals (Ogiek Peoples' Development Programme [OPDP], 2010). The community has faced several evictions from the forest, first by the colonial administration and later by successive independent governments. In addition, the group has been acculturated to some extent by the large neighbouring ethnic groups namely Maasai and Kipsigis. The Mau Ogiek people are referred to by some ethnic groups using derogatory terms such as *Dorobo* or *Il-Torobo* to mean "a poor person, a person who has no cattle and who therefore lives on the meat of wild animals" (Ng'ang'a, 2006; Ogot, 1981).

The population (of the Ogiek by 2009) stood at 78,691 or 0.2% of the total Kenyan population (Kenya National Bureau of Statistics [KNBS], 2010). Despite the discrimination, the Mau Ogiek people have held on to their culture, both material (dress) and non-material. Dress is both a noun and a verb, thus it encompasses acts and forms of appearance management. As a noun, dress is an assemblage of all outwardly detectible body modifications and all supplements/materials added to it by a person in communicating with other human beings. The definition is gender-neutral. As a verb or a process, dress refers to the act of altering or adding to appearance (Eicher & Higgins, 1997; Kaiser, 1997).

Functions of dress

The functions of dress relate to its use. Traditionally the use or function of clothing has been guided by the following early theories, namely: modesty, immodesty/sexual attraction, protection and adornment or decoration (Kaiser, 1997; Horn & Gurel, 1981). The theories explain why people wear dress. Studies however show that dress such as ethnic dress is worn to perform more functions.

Modesty

According to Kaiser (1997) the modesty theory suggests that people first wore clothing to cover or conceal the “private” parts of the human body. The theory was derived from a Christian, biblical explanation of clothing, namely that clothes were initially worn by humans (Adam and Eve) to cover nakedness due to instinctive shame. Standards of modesty therefore vary from one culture to the next, and from one historical era to the next (Horn & Gurel, 1981), even within a society depending on age, gender, sub-cultural groupings, locations and situational factors. Yet modesty is frequently acknowledged as a factor in why people continue to wear clothes (Kaiser, 1997).

Immodesty

According to Kaiser (1997) the immodesty/sexual attraction theory recognises that humans not only cover their bodies but also display them to attract others. Proponents of this theory point out that individuals may have first worn clothing in order to attract attention to, rather than conceal, the sexual organs. The theory was based on the doctrine that familiarity breeds indifference, whereas concealment breeds interest. Women use clothing to cover the body in various degrees, but with attraction as the major purpose (Horn & Gurel, 1981). Cross-cultural differences on immodesty exist. Further, individuals may appear either clothed or nude before others with accompanying feelings of modesty or immodesty (Kaiser, 1997).

Adornment

The most widely accepted theory, assert Horn and Gurel (1981), used to explain the original purpose of clothing, relates to adornment or decoration, the creative urge for an artistic experience. The adornment theory refers to the decorative nature of clothes and other forms of appearance modification for purposes of display, attraction, aesthetic expression or identification (Kaiser, 1997; Horn & Gurel, 1981). Horn and Gurel (1981) state that it is probable that various forms of adornment such as body painting, tattooing, scarification,

cicatrization, mutilation and deformation that are all common in many African communities, preceded the actual wearing of clothes.

Protection

According to Horn and Gurel (1981), the protection theory suggests that clothing is worn to provide protection, both physical and psychological, and to assist in performing certain tasks. Kaiser (1997) mentions that, clothes protect humans from the elements, animals or even supernatural forces. This functional aspect of dress is the same for rich and poor people (Horn & Gurel, 1981). Individuals also need physical protection when at war, or raiding or hunting wild animals, or collecting honey. The Mau Ogiek's warriors were involved in hunting wild animals and livestock raiding. Clothing that provides physical protection of the sex organs rather than hiding them has always been important. Examples of such protective dress include the loincloth and aprons worn by indigenous people. However, the conspicuous decorative coverings such as beads, shells and paint rather direct attention to these parts (Horn & Gurel, 1981). Dress provides psychic or magical protection. Many items of dress worn for psychological protection have become part of the folkways and customs of a society, their origins and meanings often lost in history (Orobator, 2008; Kaiser, 1997; Horn & Gurel, 1981).

According to several studies it can be deduced that dress may be used to perform the traditional functions as well as additional functions. Thus Orobator (2008), Barasa (2007), Ng'ang'a (2006), Nyaben (2006), Simba Maasai Village Museum (2005), Arthur (1997), Baizerman (1997), Eicher and Higgins (1997), Joshi (1997), Kaiser (1997), Billington *et al.* (1991), Fisher (1987), and Achebe (1966) assert that dress may be used to perform rituals (child naming, rites of passage, weddings, funerals, burials, rites of intensification, religious), recapture one's heritage, economic or commercial purpose, educational purpose, identity (ethnic group, social status or situation, moral or religious ideas, age, gender or sex differentiation, sexual maturation, relationship between a wife and husband, cultural, political beliefs, masculinity or femininity, marital status, economic position, international identification, aesthetic ideas, personal achievement, creative power and technical changes, among other aspects), communication (non-verbal), payment or currency, competitive sports, socialization, medicinal or therapeutic, court finery, daily wear versus ceremonial wear, exchange of gifts, provide privacy, stability of marriage and bestow authority.

Research has shown that the functions of dress may change over time. The *holokū* of Hawaiian women was originally worn as a symbol of one's social class, social decorum and economics. However, when the monarchy came to an end in 1893, there were no *ali'i* (royalty) after that time, hence, the distinction between royalty and commoners disappeared. The gown is now worn by all women as a symbol of Hawaiian ethnicity without the connotation of a commoner class. The *holokū* is worn to dance hula, to be married, or to attend numerous Hawaiian cultural events (Arthur, 1997).

The role theory was espoused by Ervin Goffman (1922-1982) and is rooted in a symbolic-interactionist perspective by Herbert Blumer (1900-1987). However, role theorists focus on the role an individual plays in the larger drama of society. Accordingly, individuals acquire masks to adopt certain roles for performance, and people's perceptions of self and actions are shaped by these masks (Kaiser, 1997). Role is similar to a position a person occupies in a

social situation or a unit of culture. For this position, society has already provided a “script” for one to follow (Kaiser, 1997; Horn & Gurel, 1981). Different roles have different dress expectations that result in successful performance. These expectations may be standards, implicit or written in a dress code, for a particular group (Storm, 1987). Examples of roles are gender, age and occupation, among others (Kaiser, 1997; Horn & Gurel, 1981). In traditional African societies, there are diverse occupations such as medicine man, diviner, priest, ruler, witch doctor, judge and others. In the performance of these occupations, the individuals must don their specific dress.

An article of dress may serve more than one function. Men’s ornaments often have a practical value as well as being aesthetically pleasing; may double as weapons, some are thought to give the wearer protection, while others are used as containers. Thus, *akoli* (a thumb knife) made of iron and bound with copper wire is used by Karamojong and Turkana men for both fighting and domestic purpose (Fisher, 1987). Sometimes the functional aspect of dress may be more important than the wearer’s comfort. Moreover, both the quantity and quality of dress are indicators of one’s economic position. Hence, the prosperous Hausa Chief of Northern Nigeria wears a “layered look”. The chief wears as many as twelve embroidered robes, one on top of the other (Kefgen & Spencht, 1986) despite the humid climate.

Theoretical analysis

Functions of Mau Ogiek’s pre-existing ethnic dress

Pre-existing dress is indigenous or ethnic dress the Mau Ogiek wore before the coming of colonialists, foreign religion and education, and before the settlement in Kenya of other ethnic groups, namely Maasai, Kikuyu and Kalenjin. The dress performed the traditional functions, specifically that of protection, adornment, modesty and immodesty. The dress was also used for identity, medical therapy, to perform rituals, secure dress and for compensation.

Protection

It emerged that the Mau Ogiek’s dress provided both physical and psychological protection. Physical protection was from the cold and rain thus the wearers were kept warm and dry respectively. *Oguriet op inderit* (hyrax pelt cloak) worn by all the members of the community, provided warmth to the wearer. *Rosiet* (general term for headdress) also provided warmth to children, *rwaganig* (unmarried circumcised males) and *poisionig* (married circumcised males of any age). *Leginjus* (women’s beaded leather vest) and *menegupet* (men’s leather vest) also provided warmth to the wearer. The hunters—exclusively men—also needed to protect themselves from wild animals, the harsh forest environment and enemies. It was only men who wore *kweog* (men’s sandals) for protection. The men also donned *oguriet op poinet* (bushbuck pelt cloak) for protection as it is hard and stiff; thorns and other sharp plants cannot pierce the cloak. *Njoriboit* (hyrax pelt cloak) was only worn during honey harvesting. The wearer covered the whole head with it to protect oneself from bee stings. The community also faced frequent attacks from their enemies, especially from Laikipia and the Maasai. The *rwaganig* hence provided security and wore dress such as *ingerut* (arrow), *guiyang’nta* (bow), *long’et* (shield) and *tenget* (spear) to fight the enemies. Dress enabled the

wearer to perform certain tasks. Hence, among the people, hunting and gathering tools such as *rotwop chok* (sword), *ingerut*, *guiyang'nta*, *rotwet* (knives), *pineet* and *inaing'omiit* (indigenous match stick) *long'et*, *chogeet* (scabbard), *morogiit* (quiver), *tenget*, *orpangait* (machete) and *motoget* (honey bag) were part and parcel of men's dress.

Psychological protection entailed protecting oneself from the "evil eye", death and a curse. The people believed that death, especially among young children, was brought about by curses, witchcraft or sometimes ancestors' anger. Death by a general curse may follow a family for generations. When a child was born to the family, a small part of the ear was cut to shed blood so as to protect or ward off any death in the family in future. In case a mother lost her first child, the next child she bore needed to be protected from death. To do so, the new born was dressed in *pirir orog* (necklace of red wooden pieces) or *taet* (brass bracelet). A curse could come about if one killed someone. The killer was required to wear *oguriet op saamput* (baboon pelt cloak) to take away the curse. The finding is similar to Mann (2011) that the Samburu don a strand of small glass beads necklace to which a protective amulet is attached.

Adornment

The people never went without adornment, namely *ilmintoisieg*, *mwenigg op itig* (men's and women's earring respectively), bracelets and *gariig* (necklaces). The first two types of adornment were donned by *poisionig*, *intaasatutig* (elderly women), *rwaganig*, *mureret* (unmarried initiated females) and *tyepoosa* (married *mureret*), while necklaces were mainly for women—both young and old. One *intaasat* donned *mwenigg op itig* and proudly smiled when the researcher expressed appreciation of its beauty. In addition, one *poisionig* stressed that when walking or singing the *ilmintoisieg* would swing, and he demonstrated the swing with a smile. There was laughter due to the beauty expressed.

Further, the community practised *lotet op kelegg* (removal of at least two front teeth) which was believed to enhance one's beauty or aesthetic appeal. Young men and women applied *oweyet* (indigenous jelly) on their bodies. Other articles of adornment included *mungenig* (bushbuck pelt armband) and *ng'oisit* (bushbuck pelt apron) which were worn by girl-initiates on the eve of *tumdo op tipiik* (girls' initiation rite).

Modesty and Immodesty:

Cloaks, capes and vests provided modesty to the wearer, especially women. *Leginjus* covered the *tyepoosa* and *mureret* from the chest to below the calves, as women were not allowed to reveal their legs. In addition, *leginjus* (skirt version) and *kauya* (beaded rectangular leather skirt) were worn for modesty. The skirts extended to below the calves. Young girls wore *kerepeita* (scraped bushbuck skin apron) to cover their genital area. On the other hand, *menegupet* covered the wearer from the chest to mid-thigh. The men had no shame of exposing their thighs and legs. By wearing *gariig*, *mwenigg op itig* and bracelets women tried to sexually attract men as these items enhanced their beauty.

Identification

Oguriet op inderit is known to be exclusively worn by the Mau Ogiek, thus it gave the community their ethnic identity. The result is similar to Ademuleya (2011) who asserts that *aso-oke* (cloth from the hinterland) is the traditional Yoruba hand-woven cloth. The cloth is made of spun yarn, derived from cotton or the cocoons of anaphe, a species of wild moth, woven on *ofi* (a loom). Hence, cloths made on a loom are called *aso-ofi*. The finding further concurs with Hill (2011) that in 1958, the first president of Ghana wore *kente* cloth on his state visit to the United States of America, as a symbol of his nation's cultural heritage. Sometimes the Mau Ogiek's dress was used to conceal or misrepresent a child's gender. Thus, the boy child donned girls' dress to hide his gender. The misrepresentation was done to protect the boy from witches who mainly targeted boys. *Girwogindet* (traditional chief) wore *oguriet op saamput* and carried *rungut op metit* (club with incisions) for role identity during a traditional court case.

Ethnic dress was also used to identify sexual maturation, whereby the *mureret* dressed in skin, that is, *kauya* and *leginjus* and *mwenigg op itig* for the first time. The *mureret* also wore *ingongonoit* (beadwork headband) and *tuoleg* (a series of bells). The two were worn till one got married. The *rwaganig* also wore *ilmintoisieg* for the first time. The Mau Ogiek engaged in non-verbal communication. Thus, when the girls were ready for female genital mutilation (FGM), they walked around the neighbourhood each carrying *ngotiot* (fly whisk) and a whistle. The girls moved around whistling to notify people of the forthcoming occasion and the venue.

Therapeutic and Compensation Purposes

Medical therapy was provided by *lotet op kelegg*. The practice ensured that if one fell sick and probably lost consciousness, the individual could be fed through the gap created between the lower teeth. If two people had a fight and one was injured, *segereg* (cowries) were used for medicinal purposes. The uninjured party strung together the cowries to make a bracelet and tied it on the right hand wrist of the injured person. The injured person then got well. In the earlier days, it was taboo for a girl to fall pregnant before undergoing FGM. If it happened, *oguriet op saamput* was used for compensating the family of the girl. The cloak was given to the girl's family by the family of the boy responsible for the pregnancy.

Perform Rituals

Findings revealed that during the eclipse the *intaasatutig* would wear their special dress namely *kauya* and *leginjus* and would march outside carrying the leaves of the pencil cedar tree. The women prayed to *Tororet* (God) to "break the eclipse" and restore light. The people's ethnic dress was used for burial and cleansing purposes. During burial, the body of the deceased was wrapped in one's *oguriet op inderit* and taken to the bush far away from where people lived. A few days after the burial of a family member, the entire bereaved family except the children ritually shaved the hair in small portions around the head, for cleansing and protection purposes. The hair was shaved at the front, temples and at the back. The aim was to protect the family from future death, as the people believed that death could lurk in a family. In case a family member was away when the death occurred, one could

not enter the house until one's hair was ritually shaved. However, the practice has been abandoned.

Secure Dress

Legetiet and *annuet op chogeet* (women's and men's leather belts respectively) were worn to secure various articles of dress. A thin version of *legetiet* secures the *leginjus* (skirt) and *kauya*. The skirt is wrapped around the waist, secured by the belt and folded down. *Annuet op chogeet* is tied on the waist and on top of *oguriet op inderit* or *oguriet op poinet* to secure them. The belt is also used to suspend *chogeet* and *rungut op metit* at the waist. The findings concur with Hill (2011) that *Oni* (Ife king) wears a wrap skirt secured by a wide, fringed sash, the ends of which hang down on the left side. Further, the Fulani males secure their long loose garment with belts ornamented with bright metal pieces (Adepegba, 1986).

Functions of the Mau Ogiek's post-existing indigenous dress

The post-existing ethnic dress of the Mau Ogiek performs more functions than the pre-existing dress. Probably the community has been more exposed to life in terms of interacting with different ethnic groups such as the Maasai, Kikuyu and Kalenjin. However, some of the functions are similar in both cases. Study findings revealed that the indigenous dress performs the following functions: protection; adornment; modesty and immodesty; medicinal/therapeutic; perform rituals; economic and educational; identification and communication; socialization; daily versus ceremonial wear; war and peace; exchange of gifts; provide privacy and assist to perform tasks; carriage and storage; shape the body; keep hunger pangs at bay; entertainment; tool for counting, blessing and encouragement; bestow authority and secure dress.

Protection

Physical protection from harsh terrain is provided by *kweog* that are worn only by men. Further, *njoriboit* is worn for physical protection when gathering honey. *Oguriet op poinet* covers the wearer from the chest till mid-thigh as according to Meringa (a *rwagan*) the torso is very important to men and must be protected from scratches and bruises which may be inflicted by thorns and other plants. As for the legs, there is no problem in them being bruised. Dress also provides psychological protection from a curse and "evil eye", among others, in a manner similar to the pre-existing dress. *Oguriet op inderit* is used to wrap newborn babies. During *tumdo op tipiik*, the initiates are dressed in a single wire necklace to protect them from early death thus they can reach old age. The finding concurs with the protection theory (Horn & Gurel, 1981; Kaiser, 1997) that dress provides physical protection from the harsh forest environment when gathering and hunting, psychological protection from the "evil eye", and assists in performing tasks such as hunting.

Adornment

The girls' and women's *oguriet op inderit*, *leginjus*, *kauya*, *mwenigg op itig* and *ngotiot* are embellished with glass beads of diverse colours and sizes. A small bamboo stick is worn on the upper earlobe by both men and women. Girls' *ng'oisit*, *kerepeita*, *mungenig*, *gelteet* and *chepkuleit* (headdress for girl-initiates) are also decorated with bicycle light bulbs, small

plastic lids of different colours and shiny garlands. *Rwaganig* dye leather cloaks with red ochre. Young men and women apply *oweyet* on their faces, thus dress is a cosmetic. *Lotet op kelegg* enhances one's beauty. The finding relates to the adornment theory (Horn & Gurel, 1981; Kaiser, 1997) that appearance modifications and clothes serve the purposes of aesthetic expression and identification.

Modesty and Immodesty

Tyepoosa and *mureret* are not allowed to expose their bodies, thus they are fully covered in *leginjus* and *kauya* whose lengths must extend to below the calves. Young girls wore *kerepeita* to cover their genital area. Children, especially the boys, were dressed in *oguriet op inderit* to cover their nudity. The cloaks were made to size. *Kecher* (uncircumcised boys below 18 years), *rwaganig* and *poisionig* have no shame of body exposure, when they are together. However, they must cover their private parts and have no shame in exposing their thighs and legs. Thus, *oguriet op inderit*, *oguriet op poinet* and *menegupet* extend to mid-thigh. The results are similar to Adepegba (1986) that the nomadic Fulani wear dress mainly to conceal nudity. In addition, the finding concurs with the modesty theory (Horn & Gurel, 1981) that the standards of modesty vary within a society depending on gender and age among other factors.

Ethnic dress is donned for sexual attraction whereby the *rwaganig* wear *ilmintoisieg* while *mureret* don *mwenigg op itig*, bangles and *gariig* to attract the opposite sex. According to Nesango (a *tyepoosa*) "a *tyepoosa* while cooking and serving food to her husband had to don *mwenigg op itig*, *gariig* and bangles". The aim was to be sexually and physically attractive to her husband at all times. There was laughter, due to the pride in their culture. The finding confirms the immodesty theory (Kaiser, 1997) which states that humans, especially women, dress with attraction as the main function.

Identification and Communication

Dress is mainly used to identify the ethnic group. The hyrax skin is known to be exclusively worn by the Mau Ogiek, thus it gives the community their ethnic identity. The skin is used to construct cloaks and headgear for all the members of the group. The findings concur with Boomie (2011) and Olaniyi (Personal communication, June 9, 2011) that various Nigerian peoples' dress identifies their ethnic group. Men's hats include *ula* (a Muslim cap) worn by the Hausa, *fila* and *abeti aja* (dog ear) of the Yoruba and *nze* (red cap) of the Igbo of Nigeria. On the other hand, the Yoruba women can be identified by their dress which includes *gele* (headdress), *buba* (blouse), *iro* (wrapper) and *ipele* (shawl). Tribal marks on the face are used to identify the Yoruba ethnic group. There are two types, (a) a set of three marks drawn horizontally below the eyes on each side of the face, and (b) a single cut made horizontally below each side of the face, a preserve for princes and princesses (Falayi, 2011).

To identify the gender the women wear *leginjus* and *kauya*. Earrings are also used for gender identity in that *ilmintoisieg* and *mwenigg op itig* are men's and women's respectively. The earrings are fashioned in different styles and materials depending on the gender. Dress is also used to conceal an individual's identity. During *tumdo op werik* (boy's circumcision

ceremony), the initiates smear their faces, legs and hands with *induroit* (white clay soil paste) so as to hide their identity.

It is evident that the Mau Ogiek engage in non-verbal communication through dress. Thus, a father wears *ingongonoit* (beadwork headband cum necklace) to show that his sons and/or daughters are being initiated. On completion of the initiation ceremony, *ingongonoit* is removed and stored for future use. *Rungut op metit* (with incisions) and *oguriet op saamput* easily identify *girwogindet* in a meeting, as he is the only member of the group who is allowed to wear them. The results concur with Adekola (2011) that *odun* (ritual sash) is worn only by priests of high status on special occasions. The finding is also similar to Wasike (2011) that among the Babukusu of Kenya, dress is used to identify one's status in the community. Hence, during *khuswala kumuse* (stepping on the arena) the *omuswati* or *omuseni* (a special ritual "man of memory") dons ritual regalia of *ekhorere* (headgear of Colobus Monkey pelt embellished with cowries and ostrich feather), *ekhendie* (walking stick) and *ekutusi* (a flowing robe) or *khakutusi* (animal pelt cloak). The dress is symbolic of the orator's high status in the community's hierarchy. In addition, according to Ademuleya (2011), for a young person in Ondo, owning and wearing the (old type) *aso-oke* in important communal ceremonies proves that one's wealth was not indeed recent or sudden, but with a long history. The finding relates to the symbolic interaction theory (Blumer) that dress is a non-verbal communicator, thus dress gives cues to self, role, status, age, profession and social caste, among others (Kaiser, 1997).

Medicinal/Therapeutic

Ethnic dress is used for therapeutic purposes through *lotet op kelegg*. However, in modern times, the practice is optional. Further, medical professionals discourage the practice as it weakens the remaining teeth. *Segereg* are still used for medicinal purpose as earlier mentioned. In the contemporary setting the injured person is also given some money as compensation.

Perform Rituals

The Mau Ogiek perform diverse rituals such as rites of passage, cleansing, and praying for the eclipse to disappear. Specific dress is worn during *tumdo op tipiik*, *tumdo op werik* and during burials. When *tumdo op tipiik* existed the girl-initiates wore *angeet* (Ogiek term for *khanga/leso* which is a square piece of 100% cotton fabric inscribed with a proverb) skirts on the night before their initiation, which was characterised by vigorous dancing all night long. The *angeet* was chosen as it is light in weight and flexible thus it provided freedom of movement. The girl-initiates also donned *ng'oisit* at the rear and on top of the *angeet*. In addition, the girl-initiates wore *mungenig*, *gelteet* and *chepkuleit*.

The finding concurs with Ademuleya (2011) that when *Obitun* rite (girls' initiation) existed among the Yoruba of Nigeria, the initiates wore ceremonial dress. The expensive traditional *aso-oke* included tying a wrapper of *sayan* around her waist and an *alaari* on top. Her body would be marked with *ani* (black body paint) and *osun* (camwood cosmetic). Her hair was plaited in a special hairstyle shaped like *agbe* (calabash) and her body adorned with red coral beads, cowries and brass bangles. At the *murerenig* stage of *tumdo op werik*, the Mau Ogiek

initiates dress in women's wear, specifically *leginjus*, *kauya*, *ingongonoit* and *gariig*. The finding concurs with the cultural perspective (Kaiser, 1997) which provides that appearance codes serve as "rules" on what articles of dress should be worn together.

During mourning a Mau Ogiek widow removes her *mwenigg op itig* and *gariig*. A date is set for a ceremony on when she can wear them again in the presence of her brother-in-law. The finding relates to Akintunde (2005) that in almost all African societies, widows undergo widowhood rituals, which vary from locality to locality. In addition, among the Mau Ogiek, when a father passes on, his first-born son constructs and wears *taet* (men's necklace) to communicate to others about the demise of his father. The individual may choose to don the necklace during the mourning period only or throughout his lifetime. Among the Mau Ogiek a corpse may be wrapped in *oguriet op inderit* if the deceased owned one before death. In the absence of this, one is buried in western style dress.

Economic and Educational

The people can construct any item of their ethnic dress on order for sale. Thus, the dress takes a commercial aspect. The community asks for payment to provide information about their culture, such as dress. The Mau Ogiek exhibit their material culture, which includes their ethnic dress, at the various Agricultural Society of Kenya shows. Further, the community welcomes anyone who wishes to study their ethnic dress to their habitat. The studies add to the body of knowledge on dress.

Socialization/Enculturation

The Mau Ogiek's ethnic dress plays a role in the socialization of the younger members of the community in different ways. The girls and *mureret* join the women to learn how to construct the indigenous dress as part of their role to provide dress for the family. Eventually the girls make their own dress, and it assures the women that the girls will dress themselves and their families in future. On the other hand, the *kecher* and *rwaganig* are socialised by the *poisionig* to hunt wild animals and birds, which provide the raw materials for constructing the ethnic dress. Younger males' enculturation entails being taught about the production of various articles of dress that are exclusive to men, such as *tenget* and *morogiit*. In addition, they are taught how to mend worn out items of dress, such as *oguriet op inderit*. As Cerny (1997) asserts, dress facilitates the wearer's identification with the values of the collective body, in this case the Mau Ogiek. Thus, by constructing and wearing their indigenous dress, the younger members of the Mau Ogiek are socialised. In enculturation, dress may be worn to recapture one's heritage, especially if it has been eroded (Kefgen & Spencht, 1986). The Mau Ogiek have lost their culture to some extent through acculturation by the larger communities, namely the Maasai and others. Hence, by constructing and wearing their ethnic dress, the dress plays the function of socialization.

Daily versus Ceremonial Wear

Gariig, *taet* (bracelet), *mwenigg op itig* and *ilmintoisieg* were worn by young and old men, women and children as daily wear. Observation revealed that women still wear *gariig*. Further, the *poisionig* and *intaasatutig* wear bracelets made of rubber and iron among other materials; they have maintained the pierced earlobes, and the gaps created by *lotet op*

kelegg. The people's ethnic dress is however more ceremonial than daily wear. Such ceremonies include customary weddings, *tumdo op werik*, media appearances and to attend conferences. During a customary wedding, the bridegroom must don *oguriet op inderit* and the bride wears *ingarepait* (beaded leather brides' necklace), *kauya*, *leginjus* (vest) and *oguriet op inderit*. In initiation ceremonies the initiates' fathers don *ingongonoit*. On the other hand, the girl-initiates wore *ng'oisit*, *mungenig*, *gelteet* and *chepkuleit* and dressed in *tuoleg*, *ingongonoit*, *kauya* and *leginjus* upon graduation. The boy-initiates donned *oguriet op inderit*, black he-goat pelt cloaks and *indurotoit*. *Mutiriot* (male teacher) in *tumdo op werik* must wear *oguriet op inderit*. The main articles of indigenous dress worn during media appearances and conferences are *rosiet* and *oguriet op inderit*.

This finding is similar to Arthur (1997) as the function of dress may change over time. In addition, the results concur with Ademuleya (2011) who established that previously *aso-oke* cloths of the Yoruba were cloths of prestige value among the people's kings, chiefs and wealthy men who could afford them on important occasions. Today, in most parts of Yorubaland, the cloth is seen more as cloths for ceremonies, important commemorative occasions such as weddings, naming, chieftaincy installation and funerals. Further, the finding concurs with the contextual perspective (Kaiser, 1997) which relates to how people manage and perceive appearances in everyday life considering the actual social situation, such as weddings, rites of passage and media appearances.

War, Peace and Exchange of Gifts

In the contemporary setting, peace prevails, thus the men's dress is basically for hunting and gathering honey, and not to fight their enemies. The ensemble includes *oguriet op inderit*, *guiyang'nta*, *chogeet*, *ingerut*, *tenget*, *rotwop chok*, *oguriet op poinet*, *pineet* and *inaing'omiit*. A *kecher* may be rewarded with *oguriet op inderit* if he successfully undergoes circumcision. On any university graduation ceremony in which a member is graduating, one is given *oguriet op inderit*. The result is similar to the account in "Gifts and blessings" (2011) whereby Madagascan bridegrooms offer *lamba* (hand-woven cloth) to their brides at marriage.

Provide Privacy, Assist to Perform Tasks and Storage

Oguriet op inderit, also worn by women, is used to cover the baby when breastfeeding, thus it provides privacy to the mother. *Gesenta* (baby carrier) is used to carry a baby at the back. Also a head pad is made and placed on the head to provide support to girls and women when carrying a water pot.

Motoget is used to carry harvested honey. Further, the bag is used by older people to store their small personal belongings and for carrying food such as *sirigonig* (dried meat) in case of food scarcity or when one is on a long journey. *Motoget* is also used for carrying an indigenous lighter that is employed in honey harvesting. *Morogit* is used for storing and carrying *ingerut*, in addition to carrying portable tools used for gathering honey such as *pineet* and *inaing'omiit*.

Shape the Body and Keep Hunger Pangs at Bay

Indigenous dress is worn to enable women who have recently given birth in order to get back to their original shape and size. Soon after delivering a child, *legetiet* is tied tightly around the waist to make the abdomen firm and to reduce its size. The belt may be tied directly to the skin or worn on top of the garments. Probably the women desire to keep their husbands sexually and physically attracted to them even after child birth. The women also wear a thin version of *legetiet*. The belt is very tightly wound round the waist on top of *leginjus* or *kauya* such that one cannot feel hungry and can go the whole day without food. The function would come in handy in times of famine.

Entertainment

The *rwaganig* are sometimes asked to entertain people. The *rwaganig* don embellished *oguriet op inderit* instead of *oguriet op poinet* and even wear *gariig*. The dancers tie bells on their thighs, which resemble those of the Ambeere of Eastern province, Kenya. The bells make a lot of noise, similar to a gun shot when the dancer is dancing. The women of diverse ages have organised themselves into a dancing group. The women don their ethnic dress, mainly *oguriet op inderit*, *taet* (brass necklace) and *mwenigg op itig*, whenever they are called upon to entertain visitors such as government or foreign officials.

Tool for Counting, Blessing, Encouragement, Bestowing Authority and Securing Dress

During *goito* (wedding) the bride wears *ingarepait* and she knots the strands as promises of beehives are made to her. Later she counts the knots. The bride is also smeared on the entire body with *oweyet* as a blessing. During *tumdo op werik* the initiates get encouraged and enticed with gifts of *oguriet op inderit* by their fathers' age-mates. The *rwaganig* on graduation are bestowed the authority to defend and protect the clan from enemies. Thus, they are given *rungut op metit*, *rotwop chok* and *mukwanjit* (walking stick) to symbolise the duty. Dress also consistently performs the function of securing an article of dress as earlier discussed.

Conclusion

The indigenous dress of the Mau Ogiek people has continually performed various functions since time immemorial. Some of the functions have persisted, such as physical protection and performing rituals, while others have been abandoned, for instance shaving the hair after a burial for psychological protection from death. Further, other functions are now optional, such as *lotet op kelegg*. The ethnic dress in the contemporary setting plays more functions than the pre-existing one. For instance, economic and educational, exchange of gifts, shaping the body and bestowing authority. The functions of dress may change over time. The Mau Ogiek's ethnic dress is more ceremonial than daily wear.

An item of dress can perform more than one function. The *motoget* is used for storing honey during harvesting. The bag is also used by older people to store their small personal belongings and for carrying food such as *sirigonig* in case of food scarcity or when one is on a long journey. The *motoget* is also used for carrying an indigenous lighter during honey harvesting. Further, *annuet op rotwetop chok* are used for suspending swords on the waist

and for securing the cloaks. *Leginjus* performs three functions at the same time, namely modesty, adornment and protection. The documentation of the dress has provided a cross-cultural point of view on the universal theories and practices of dress and adapting the same to an African ethnic dress.

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Figures



Figure 1 Woman in *oguriet op inderit*, *mwenigg op itig* and *taet* (Nessuit Location)



Figure 2 Fastening of *oguriet op inderit* and *menegupet* by men. (Photo taken in 1957.)



Figure 3 *Rungut op metit* and *rotwetop chok* are suspended on the right hand side. (Nessuit location.)



Figure 4 *Morogijt* and *motoget* must lie on the left hand side. (Nessuit location.)

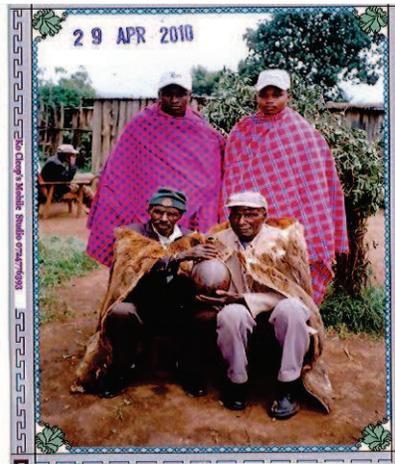


Figure 5 Mutiriot wearing *oguriet op inderit, chepkuleit, angeet* and carrying *ngotiot*



Figure 6 Girl-initiate in *gelteet* Photo courtesy of community in Nessuit location. 1998



Figure 7 *Motoget*. OPDP, Nakuru.



Figure 8 *Lepelo*. (Nessuit location.)



Figure 9 Boy-initiates in girls' dress, *kauya* and *leginjus*. Photo courtesy of community in Nessuit location



Figure 10 Woman in *mwenigg ingongonoit*, *gariig op itig* (Nessuit location.)



Figure 11 *Leginjus*. Photo taken at Nairobi National Museum



Figure 12 *Oguriet op poinet* Photo taken at Nairobi National Museum

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Home Economics and food literacy: An international investigation

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Abstract

Child and adult obesity is a growing concern in affluent nations around the world, as typified in Australia where the incidence is more than 25% for children and 55% for adults. The connection between obesity, food choices, nutrition knowledge, and food preparation skills is well established. However, education about the concept and processes of 'food literacy' is relatively new. Furthermore, public discussion about the role of schools and formal curriculum to prepare young people to be food literate has received scant attention until recently, when medical experts dealing with the consequences of the obesity epidemic made the following plea "providing a mandatory food preparation curriculum to students throughout the country may be among the best investments society could make—bring Home Economics back" (Lichtenstein & Ludwig, 2010, p.1858). This paper reports on an international study about the role of Home Economics in developing food literacy. Data were collected using an online survey with respondents from around the world replying to a series of questions about this topic. A total of 1188 respondents from 36 different countries in the world shared their views. Among key findings are the differences in understandings of 'food literacy'. Recommendations for future action are presented as a conclusion to this paper.

Introduction

Home Economics engages with food and food plays a pivotal role in our lives. It is a basic and essential aspect linked to our survival, our beliefs, and our impact on the natural environment as well as our sense of self via memories and emotions. The sharing and providing of food is "... fundamental to human experience and human culture" (Focus on Food, 2010, p.125) and as a pedagogical tool, food literacy education is a useful way of examining the interplay between social, political, economic, and environmental aspects of many food issues.

The "evolution of human biology and human society have been intimately shaped by the types and amounts of food available" (McMichael, 2005, p.713). From the advent of the agricultural revolution, human civilisation has developed around sustainable food supplies, leading to settled communities, specialisation of trades, trade economies, and growth of complex political systems. When production becomes less plentiful and consumption more problematic, humankind seeks new means and systems. Analyses of current global trends illustrate that, for around the past quarter-century humans have been living beyond the environment's ability to sustain this consumption (McMichael, 2001). Given this escalating impact of humankind, alongside scientific and technological developments in food production,

increasing consumer expectations, a rising global population and malnutrition especially excesses of particular nutrients, a diverse range of strategies and solutions need to be dealt with. Furthermore, Sen (1981) discusses economic and social inequities resulting in global disparities about food access. Social fracas and discontent create global tensions. Hunger, is both a social justice and a sustainability issue. According to the World Food Programme (2009), around 66 million children in developing countries attend school hungry daily. The United States (US) Department of Agriculture's latest food security report (Nord, Andrews & Carlson, 2009) estimates that because of inadequate finances or other resources, nearly 15% of US households' had limited access to food at some time during the year. This food insecurity is the highest since statistics were first collected in 1995 (Weaver-Hightower, 2011).

Young people need to be positioned (in terms of skills and knowledge) and 'dispositioned' (in terms of values and attitudes) to cope with change, complexity and insecurity in such food contexts. As confident consumers they will require knowledge and skills to make healthy and appropriate food choices and as responsible, critical citizens they must underpin this with an understanding of the interdependence of all living things and a global perspective including sustainability and social justice, to come to a deeper understanding of the complex environmental and social components of food in our lives. These inter-relationships have become obscured as our methods of food production and consumption have changed (Hubert, Frank & Igo, 2000; Goodman & DuPuis, 2002). Such ethical engagement and emancipative action (Brown & Paolucci, 1979) will ensure that our young people are effective contributors in the 21st century.

Literature review

Food in the curriculum

There is no question that "one of the closest relationships between us and our environment is our daily need to consume food" (Stinson, 2010, p.10). Food and health should not be seen as subservient to or the servant of traditional academic subjects. Food education is often disregarded or viewed as less weighty than other subject disciplines as academia's dualism of mind over body has cultivated "disdain for something as mundane, corporeal, even 'animalistic' as eating" (Belasco, 2008, p.2). Furthermore, the tendency is to privilege curricula which concentrate on the public sphere of men while the private, domestic sphere which has historically been associated with women becomes subsidiary. Food preparation and cooking skills and knowledge of food and nutrition and its related themes is consequently devalued, even trivialised, with stereotyped gender roles playing a part in the dynamic.

Feeding the family and cooking remains a highly gendered practice (Murcott, 2001; Walter, 2009; Prior *et al.*, 2011). Debate about the state of cooking has increased in recent years with many arguing that it is being revised, routinized, deskilled and devalued, and in decline (Short, 2003). However, rather than being in decline, Frances Short's interpretation suggests that cooking skills are constant and unchanging and she reveals a complexity to cooking skills and knowledge "... as incorporating more than just practical, technical ability" (p.17) incorporating sophisticated abstract, conceptual and perceptual skills and understandings, as well as organisational skills and academic knowledge for example. She emphasised the

importance of circumstances when preparing and cooking food - the contextual nature and linked to lifestyle.

In discussing food in the curriculum, it is necessary to look beyond cooking skills to provide a fuller contextual view. Scientific and technological developments in food production and preparation have reformulated food to the extent that in developed countries, consumers require spending less time and thought in food preparation and cooking (Vileisis, 2008). The trend for spending less time cooking by purchasing more processed food is well documented. For example, in their study of time use in France, the United Kingdom, USA, Norway, and Holland, Warde *et al.* (2007) found a decline in the amount of time spent cooking in all countries and a decline in the amount of time spent eating in all but France between the 1970s and the late 1990s. Consumers are also more distanced from the growing, killing, fortification, processing and promotion of food. It is unsurprising therefore that many young people know little about the sources of food and consider cooking to be “having to mix stuff” (Moisio *et al.*, 2004, p. 373). Thus considerable change in supply, distribution and consumption of food, as well as contradictory food and diet recommendations, food scandals and in certain parts of the world, abundance of food; puts increasing pressure on consumers to make informed decisions, indeed to make decisions.

Education has been an essential component of action to promote health and to improve life quality. Home Economics was introduced to the curriculum during the industrial revolution as a means to improve societal conditions such as poor diets and living conditions illustrating then as now a close association between Home Economics and health (Geen, Jenkins & Daniels, 1998; Pendergast, Garvis & Kanasa, 2011). Historically it was also related to the domestic positioning of females in wife, mother and domestic worker modes (Petrina, 1998; Pendergast, 2001).

Contemporary Home Economics, while continuing to incorporate health, now employs a wider lens, as outlined in the International Federation of *Home Economics Position Statement Home Economics for the 21st Century* (2008, p.2):

... embrace multiple disciplines, synthesising these through interdisciplinary and transdisciplinary inquiry. This disciplinary diversity coupled with the aim of achieving optimal and sustainable living means that Home Economics has the potential to be influential ...by intervening and transforming political, social, cultural, ecological, economic and technological systems.

The food and health emphasis remains in Home Economics curricula (Pendergast & Dewhurst, 2007) and several studies (Fordyce-Voorham, 2009) and projects have examined or are examining key elements of food and health programmes (cf. Pendergast, Garvis & Kanasa, 2011). Some are engaging food experts and young people, for acknowledging these voices and perspectives creates conditions for the development of interpersonal, intercultural, social and civic competence, leading to personal empowerment and is a characteristic of successful health interventions (Arblaster *et al.*, 1996).

Currently a two year project, with five pilot projects across Europe is constructing a food framework to comprise a set of competences for young people aged 5-16 years, relating to diet (food and drink), active lifestyles and energy balance (European Food Framework, 2011). The framework will provide a consistent, up-to-date and accurate (evidence based) consensus, supporting all involved in food education.

A recent independent scientific enquiry in the UK to tackle obesity (Butland *et al.*, 2007) identified the development of cooking skills to be an important strategy in reducing the demand for convenience foods which can contribute towards obesity. As health professionals working in schools with expertise in food and nutrition, Home Economics teachers play a significant role in food and nutrition as aspects of health education. With increasing recognition of the environmental impact of food, World Wildlife Fund-UK has just published its Livewell report (2011), which aims to reduce the environmental and social impacts of food consumption to move away from unsustainable food choices, towards sustainable ones that support global agriculture and biodiversity as well as health. It suggests extending the traditional focus on nutrient recommendations for health to include wider issues of sustainability.

Currently “[T]he public health concerns connected to the obesity epidemic have proven to be the catalyst for revisiting the role of formal food-related skills in the curriculum” (Pendergast, Garvis & Kanasa, 2011, p. 417) and for renewed attention by researchers (Lichtenstein & Ludwig, 2010; Weaver- Hightower, 2011, Butland *et al.*, 2007)).

Obesity and health

This research has been conducted at a time of continuing great concern about the levels of obesity and its negative physical, psychological and social impacts (UNICEF, 2000; Zaninotto *et al.*, 2006) as well as economic and cultural consequences (Wanless, 2002). There are well-documented links between obesity and cardiovascular disease, diabetes, osteoarthritis, cancer, dermatological and rheumatic diseases, asthma and other respiratory diseases (World Health Organisation, 2000) thus the improvement of young people’s health is a key aim of international policies (UNICEF, 2000; World Health Organisation, 1995; Youth Forum Jeunesse, 2008). Within the school context, the importance of a health promoting environment is emphasised which stipulates that mental emotional, social and physical wellbeing is essential for successful learning and living (International Union for Health Promotion and Education, 2005).

In a systematic review of research to explore the relationship between obesity and educational attainment (Caird *et al.*, 2011) findings suggest a weak relationship between obesity and lower levels of attainment among children and young people. In addition, almost half of the twenty-nine studies reviewed found other relational factors such as socio-economic status. One of the most noticeable ways in which obesity affects the lives of children and young people is in their social relationships with related problems such as bullying, anxiety disorders, low self esteem and stigmatisation (p. 24). Further strong evidence supports an association between obesity and poor mental health in teenagers and adults (Gatineau & Dent, 2011). Impacting on all four dimensions (physical, mental, emotional and social) of wellbeing and on learning (be it relatively low), the need to reduce childhood

obesity is a critical health problem and further heightened by the increasing prevalence of adult obesity in both developed and developing countries (Popkin & Doak, 1998). Some predict that if the current childhood obesity continues, this generation could face shorter life expectancy than their parents (Lee *et al.*, 2010). Data from England (2007) indicate that over one in six boys aged 11-15 (17.6%), and nearly one in five girls aged 11-15 (19.0%) would be classed as obese (Health and Social Care Information Centre, 2009). Data from a Scottish Health Survey provided estimates for girls and boys aged 12-15 in 2008. The survey found that 19.1% and 15.8% of boys and girls respectively would have been classified as obese (Corbett *et al.*, 2009). Overall, the position that is agreed is that "... this epidemic ... is unlikely to come to a natural end, that is, without intervention" (Butland *et al.*, 2007, p.17).

In a recent paper related to obesity Lichtenstein & Ludwig (2010) suggest that "...girls and boys should be taught the basic principles they will need to feed themselves and their families within the current food environment: a version of hunting and gathering for the 21st century" p. 1857. McMichael (2001) too argues that to facilitate a better understanding of the inter-relationships between health on human and environmental levels requires education to focus on food literacy suggesting it can respond to the great challenges of the twenty-first century.

It would certainly be visionary if education communities made every effort to achieve a step change in relation to food literacy education by making it compulsory or by an initiative such as that recently introduced by one government body (The Scottish Government, 2011). An expert group (half of whom were practicing Home Economics teachers) were tasked with advising its educational community and its stakeholders what transformational change in the teaching and learning of food and health should look like, identify the key components and offer advice on how these could be incorporated into practice. This literature review will now turn to exploring the concept of literacy and of food literacy specifically.

Literacy

Debate abounds about the types and definitions of literacy and how they can be utilised in everyday life to develop understand and apply particular fields of study. The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines literacy as the

... ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society (UNESCO, 2003, p.13).

Smith (2009, p.55) suggests that "[G]eneral literacy has broadened to include negotiating, critical thinking and decision-making skills". Orr (1992) offered the term ecological literacy to suggest an ability to understand the inter-relationship between people, societies and natural systems and in 2008 Capra argued that "*the survival of humanity will depend on our ecological literacy*" (italics in original, p. 244). Food is one of many important ways in which we relate to the rest of an ecological system and the challenge for 21st century living is to integrate health of the biosphere and human health. Since healthy food choice is one key

element of health, the multidisciplinary field of health literacy must also be factored into this inter-relationship. Health literacy as a social determinant of health offers many opportunities to reduce inequities in health (Nutbeam, 2000). The wide range of skills and competencies that people develop over their lifetimes use health information to make informed choices, reduce health risks, and increase quality of life (Zarcadoolas, Pleasant, & Greer, 2006; Rootman & Wharf-Higgins, 2007).

Examining the concept of health literacy, Nutbeam (2000) identified three progressive levels of health literacy: basic/functional, communicative/interactive and critical. Functional health literacy is the use of basic literacy skills to function successfully in everyday situations, while interactive health literacy expands these handling information skills with social and personal skills applied to new and more complex situations. Critical health literacy as its name suggests, is the development of further cognitive skills for critical analysis, thus leading to self-efficacy and empowerment towards individual and collective actions. These aspects usefully classify health literacy in terms of what it enables individuals to do (Freebody & Luke, 1990) and how it can improve capacity for social action. Literacy is thus an enabler and a capacity. In relation to school learning, St. Leger (2001) usefully provides an expansion of the three progressive levels of health literacy (identified above) where food is a major component.

Acknowledging its interactive and critical aspect the World Health Organisation define health literacy as “...the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health. Health Literacy means more than being able to read pamphlets and successfully make appointments. By improving people’s access to health information and their capacity to use it effectively, health literacy is critical to empowerment” (World Health Organisation, 2009). Advancing the notion of empowerment and capacity for an enhanced systems-based understanding of food preparation, production and behaviours, nutrition and the environment, Wilkins (2005) uses the term “food citizenship” describing it as “the practice of engaging in food-related behaviours that support, rather than threaten, the development of a democratic, socially and economically just, and environmentally sustainable food system” (p. 269). The conscious food consumer is also identified in a European project. It defines food literacy as a personal core competence and “...ability to organise one’s everyday nutrition in a self-determined, responsible and enjoyable way” (Schnogl *et al.*, 2006, p. 1) thus acknowledging the dimensions of citizenship, sustainability, self efficacy, politics, ethics and human health. Together, these can positively influence future food security, health and well-being, and survival (McMichael, 2005).

In Australia in 2011 a national study of Australian food experts that explored the question - *What is food literacy and does it influence what we eat?* Conducted by Vidgen and Gallegos (2011, p.ii) using the Delphi method, the following definition was found to be the most acceptable definition:

[T]he relative ability to basically understand the nature of food and how it is important to you, and how able you are to gain information about food, process it, analyse it, and act upon it.

Home Economics and Food Literacy

Home Economics has been confidently and knowledgeably dealing with health literacy and in particular the food literacy component for many years, helping to give young people the means to develop and define their future and is therefore well positioned to deal with what has become one of today's principal, yet neglected education problems. Inclusive of social justice, the concept and processes of food literacy is a way of bringing together interconnecting elements such as food skills, food culture and global food systems, health related behaviours and environmental sustainability.

In supporting young people's learning with opportunities to become literate about food in a nutritional, environmental and socio-cultural sense, it can be argued that "[H]ome economics is situated at the crux of the solution" (Caraher, 2009, p. 6). Hands-on work with food is an excellent basis for young people to develop food preparation and cooking skills and resourcing food literacy lessons to encourage healthy lifestyles should be seen as an investment in children's futures. It is in the Home Economics lab that health, nutrition, diet, sustainability, animal welfare and consumer issues become sharply relevant. It must be recognised that food preparation and cooking encourages excellence, develops transferable skills such as co-ordination and psycho-motor skills, organisation and management skills, and interpretative/analytical skills and can provide a myriad of opportunities for young people to gain a sense of achievement, a personal pride in workmanship, global cultural awareness and an aesthetic sensibility. The capabilities to understand food and to create good, healthy food are life skills for independent living.

Methodology

An online survey was developed and administered using viral techniques. The purpose of the study was to:

- provide insights into the definition of food literacy
- seek opinions relating to the age at which food literacy should be included in the curriculum
- explore who has responsibility for the teaching of food literacy
- provide opinions about components of the food literacy curriculum
- suggest future directions for food literacy education.

Instrument

The instrument comprised of 9 questions, two of which were demographic (country and years as a professional Home Economics teacher). Questions typically had closed responses with the opportunity to add additional comments.

Administration

The survey was piloted and designed for online completion only using SurveyMonkey. SurveyMonkey is an online survey site that allows 17 formats for asking questions (multiple choice, true false, open-ended, etc.). An e-mail with a link to the online survey was sent to

members of several Home Economics professional associations including the International Federation for Home Economics and Home Economics Victoria. In addition, listservers of Home Economists were approached and individuals were invited to distribute the survey to others. In this way the survey administration is described as being 'viral'. The survey was administered over a 3 week period in mid 2011. No follow up procedures were used.

Respondents

Because viral techniques were used to distribute the survey, it is impossible to determine a response rate. The total valid responses to the online survey was 1188.

Data and data analysis

SurveyMonkey was used to generate frequencies for each question and data was exported into SPSS for more complex analysis.

Findings

Demographics

There were 1188 respondents from 36 different countries in the world. Twenty-three respondents failed to identify their country. Between them, four countries accounted for 92% of respondents: United States with 651 (55%); Australia 176 (15%); United Kingdom 127 (11%); and Canada 125 (11%). Other countries with 5 or more respondents include: Ireland (16), Malta (9), Norway (5) and Sweden (11). What was very exciting about the respondents was the number of countries in which respondents resided. For the purposes of this paper, overall findings will be presented with a focus on the four largest respondent groups also presented. A separate analysis will focus on responses according to the 5 geographical regions of IFHE in another paper.

Along with the country of origin, the length of time as a teacher of Home Economics was the only other demographic information sought from respondents. Figure 1 provides a visual representation of the proportion of respondents from each of the four countries according to the number of years of teaching experience. Across the four countries, there is a strong trend towards respondents having over 20 years of experience, with 50% the average across the four countries. On average across the countries there were less than 20% of respondents with 5 years or less teaching experience, including a small number of student teachers in each country.

Food literacy

In terms of understandings of food literacy, respondents were provided with the following open-ended question:

According to a recent project, food literacy is the "capacity of an individual to obtain, interpret and understand basic nutrition information and services as well as the competence to use that information and available services that are health enhancing". How might you define food literacy education?

With respect to the question ‘At what age should food literacy begin?’ a wide range of terminology was used in the responses which reflected the various schooling systems around the world. The open-ended responses were categorised according to consistent theme/terms and data is presented for the larger cohort and then the four largest country responses.

Across all country respondents, 22% stated a specific age they believe food literacy education should begin. This was followed by preschool (14%); primary (10%) and kindergarten (9%). For the largest four country respondents the ‘age’ category was further analysed to identify specific ages, with the following results, as presented in Figure 3.

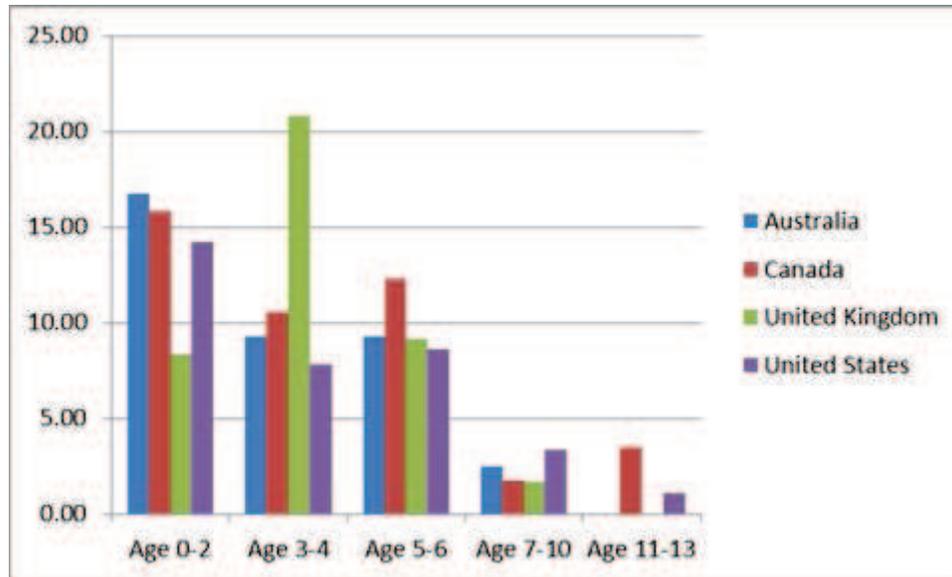


Figure 3 Ages stated by four largest cohort countries, by percentage

In summary, when the data sets are taken together, there is a strong trend towards food literacy being introduced early in the lives of individuals, around the world. The latest recommended starting period was the ‘middle years’, usually defined as 10+, which had a total of 1% of respondents, in this case representing about 11 individuals.

With respect to the question ‘Do you think that the development of food literacy capabilities is a shared responsibility?’ of 1069 valid responses 1026 (96%) responded in the affirmative; with just 21 (2%) suggesting not. Twenty-two (2%) responded that they ‘don’t know’. Respondents were further asked to consider who the partnerships should be with, or if it is not a shared partnership, why not. Given the strong affirmation, further analysis of who the partners should be was investigated with the ten most common partners listed in Table 1 below.

was developed from the literature around characteristics of food literacy. Respondents also had the opportunity to add other elements they believed were missing from this list.

Data for the four largest cohorts of respondents is presented in Figure 5.

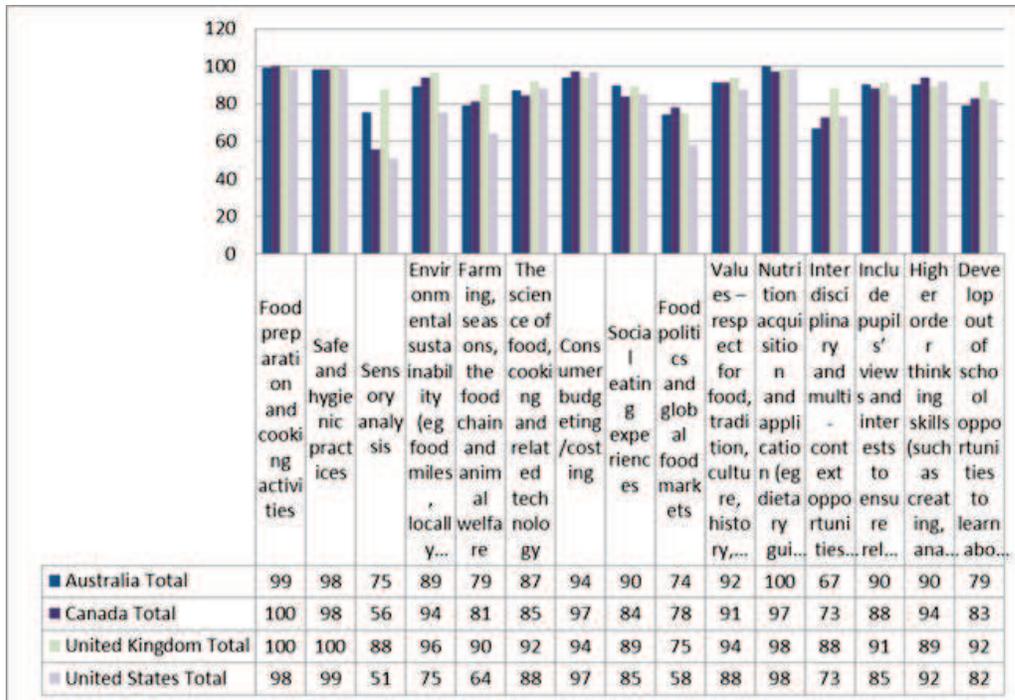


Figure 5 Components for inclusion in a food literacy curriculum

Of note in this data are the high levels of agreement across the 15 dimensions for each of the four countries. More than 50% of respondents from each of the countries agreed to the inclusion of all 15 elements. The lowest level of support was for ‘sensory analysis’, particularly for Canadian (56%) and US respondents (51%). The highest level of support was for the element ‘food preparation and cooking activities’ for Canada (100%); UK (100%); Australia (99%) and US (98%); followed closely by the elements ‘safe and hygienic practices’ and ‘nutrition acquisition and application’.

Taken in order of selection for the four largest cohorts, the following is the order in which the elements have been ranked for inclusion in the food literacy curriculum:

4. food preparation and cooking activities
5. safe and hygienic practices
6. nutrition acquisition and application (e.g. dietary guidelines, nutrients, healthy eating)
7. consumer budgeting/costing
8. higher order thinking skills (such as creating, analysing and evaluating thereby empowering individuals to make and enact informed choices)
9. values - respect for food tradition, culture, history, festival

10. pupils views and interests to ensure relevance and ownership
11. environmental sustainability (e.g. food miles, locally sources food, impact of food production, manufacture and consumption, Fairtrade)
12. the science of food, cooking and related technology
13. social eating experiences
14. developing out-of-school opportunities to learn about food and cooking
15. farming seasons, the food chain and animal welfare
16. interdisciplinary and multi-context opportunities to work with other curricular areas
17. food politics and global markets
18. sensory analysis.

The final question on the survey was a very open 'Where next?' question which asked respondents to indicate 'what would help you to further develop a food literacy curriculum and positive food literacy ethos in your school?' This question is analysed in a follow up paper.

Discussion

The findings from this study reveal a commitment to a broad understanding of food literacy incorporating a wide range of elements which should be introduced in the early years of childhood in partnerships with key players including teachers, parents and the wider community.

However, there is little point in developing nutritional knowledge on healthy eating if the skills, experiences and taste preferences to implement them are marginalised (Caraher *et al.*, 1999). Traditionally, health promotion has focused on changing knowledge, attitudes and behaviours and the development of food preparation and cooking skills may be seen as a practical meeting point of all three.

In addition, a social constructivist, pedagogical approach emphasising a wide range of food based and higher order skills—beyond the 'how to' technical practices to include the (why) interpretive and deep learning within such practices, ensures that the development of values, beliefs and actions, resulting from open questioning, critical analysis, debate and discussion are therefore personal and more likely to be adopted. Furthermore, student participation in active learning can strengthen student-teacher relationships, improve the classroom climate, accommodate a variety of learning styles, and provide alternative ways of learning (Watkins, 2003). By using active learning methodologies students will not only come to a deeper understanding of the issues involved, but also that their motivation and enthusiasm will be heightened.

This study reaffirms the importance of Home Economics. It gives Home Economics educators a platform to become global leaders in tackling the obesity problem that is challenging policy makers worldwide and to contribute to other contemporary food issues. A key strategy will

involve collaboration action, and alignment with other stakeholders. The data presented affirms that Home Economists globally are like-minded in their beliefs about the need for food literacy curriculum.

A comprehensive portfolio of interventions is needed to cover the full landscape of food literacy education; otherwise partners operating on one element (such as human health, environmental health or the food system) might undermine positive actions elsewhere. Schools have struggled for years with a range of short term initiatives or restricted Home Economics timetabling and staffing thus reducing the potential of food literacy education; they need stability and to deliver with experienced professionals. To maximise the contribution of their expertise, Home Economics educators should lead and co-ordinate in the development of and vision for food literacy education. This may involve interdisciplinary school projects or food themes within Home Economics curricula.

Working in partnership with wider community health and wellbeing groups can raise the profile and understanding of food literacy. The home school relationship is vital and activities involving parents, community learning courses and pupils as peer tutors can enhance school based health programmes (Forneris *et al.*, 2010) If embedded within wider community health developments, food literacy could also have a positive impact on individuals, families and wider society.

Linking with food and health sector businesses can do much to enhance the learner experience. Providing young people with opportunities to engage with professionals from the food and health industries, work experience or site visits can enhance the learner experience and may stimulate an interest in a future career.

It seems that the plea from sources outside the profession to “bring Home Economics back” by “providing a mandatory food preparation curriculum to students throughout the country may be among the best investments society could make” (Lichtenstein & Ludwig, 2010, p.1858).

Biography

Professor Donna Pendergast, PhD is Dean of the School of Education and Professional Studies at Griffith University, Brisbane, Australia. Donna researches and writes about Home Economics philosophy, education and practice. Donna recently completed her 4 year term as Vice president of the Pacific Region and member of the IFHE Executive. She continues to serve the profession as Chairperson of the IFHE Think Tank Committee and Editor of the International Journal of Home Economics. She has served as National President of the Home Economics Institute of Australia, and President of the Queensland division.

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Redefining and repackaging Home Economics: case of a Mediterranean island

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Abstract

Home Economics as a discipline and profession has been developing, shaping and re-shaping all around the world. Malta has been no exception to this evolution. This paper seeks to explore the historical developments of Home Economics in this ex-colonial Mediterranean island and to provide insights into the position of Home Economics today in the Maltese education system and in society. Whilst outlining the philosophy, vision and theories which inform Home Economics education in Malta, the focus of this paper is particular to the features of Home Economics courses and curricula at different levels. This paper shows how the Home Economics and Textiles Studies teacher training programme has developed and how the profession continues to grow and reach out through the formation of an active association. Insights into the need for a name change and how Home Economics professionals are systematically contributing to health and consumer education through a specialised centre and the mass media are given. All this work has given rise to an improved status and current positioning of the Home Economics discipline and profession.

Keywords: Home Economics, historical developments, curriculum, teacher training, Malta

History of Home Economics in Malta

Home Economics (HE) has been offered as a school subject in Malta since the beginning of the 20th century (Portelli, 1996). Though not called HE at the time, it was presented as an examinable subject to fifth form secondary school students in 1910-11. Since then, the subject has gone through various name changes, from Domestic Economy to Housecraft, Domestic Science, and finally Home Economics as it is still called in secondary schools today. Initially, sewing and textiles topics were incorporated in HE, though eventually these were established as a separate school subject.

The family living conditions of Maltese society in the 1930s were reflected in HE education through the opening of a Housecraft school which addressed the needs of the time, such as educating young women in practical and organisational skills required to maintain a home. 1959 saw the start of schools being equipped with HE and Needlework (NW) laboratories with adjoining flatlets. The first school to be equipped was the Maria Assumpta girls' secondary school in the central part of Malta. This school was funded through a UNESCO project and was well supported, being provided with the latest equipment and technology.

Throughout the mid- and late-20th century, HE became a regular component of girls' education in state schools and some non-state schools. Both HE and NW were two separate

compulsory subjects in the first two years (age 11-12 years) of state secondary schooling in Malta for girls and were also offered in one church school. Following the two compulsory years, girls could specialise in the subject further, from Form 3 (age 13 years) onwards. Some changes in the state school education system in 1990 brought changes to HE and NW, the latter now known as Textiles Studies (TS), when these became optional subjects in Form 1 and 2 and then a subject of specialisation in Form 3 to Form 5. HE, but not TS, was introduced as an optional subject to boys in the scholastic year 1992-3. Courses in the HE discipline are currently offered at secondary, post-secondary and tertiary level, with textiles topics being incorporated with HE at the two higher levels.

For the remainder of this paper, HE should be taken as also referring to TS, unless specifically stated otherwise.

The philosophy, vision and theories which inform Home Economics education in Malta

HE focuses on the inter-relationships between resources, diet, health, the home and individual and family needs, where the central concern is achieving an optimal quality of life for individuals and their families. The aim of HE education is to equip students with the knowledge and skills necessary to lead effective lives in their different roles and in different contexts in society, specifically to maintain and promote lifelong healthful behaviours, become productive citizens and adapt in a fast-changing world.

The theories which inform HE education in Malta are mostly positivist, where the information which is disseminated is factual and scientifically based. However, critical social theory also underpins the HE goal of developing reflective critical citizens and consumers in our society. The aim is to encourage an open mind and an emancipatory approach to resolving issues and problems. In this regard, another theory which directs HE education locally is the liberal reformist theory, where the emphasis is on acknowledgement of equal rights in the broadest sense for men and women and promoting a way of thinking which will dismantle stereotypes and provide equal opportunities.

In recent decades, a sensitivity towards the interdependence of human activity and the different factors in the different levels of the environment, as motivated by key human ecosystems theoretical perspectives (Bronfenbrenner, 1989; McGregor, 2009) has emerged strongly in the local HE syllabuses and course descriptions. This has led to refocusing on the transmission of knowledge and skills in favour of positive action of humans towards preserving and making best use of resources which are available to individuals and families in the different environments and which need to be used effectively for optimal human and planetary wellbeing.

The Home Economics and Textiles Studies syllabuses at secondary level

At secondary level, there are separate HE and TS syllabuses. Both subjects are scientific, critical and practical in nature, based on relevant realities, and offering hands-on learning experiences. The subjects have an investigative orientation too, where students are given

opportunities to explore and apply scientific rules and processes of human perceptions, values and use of resources.

As explained earlier, in state secondary schools, HE and TS are optional subjects in Form 1 and 2, and can then be chosen again for further specialisation in Form 3 upwards. A very high proportion of both male and female students from state schools in the Form 1 cohort generally choose HE as their optional subject for a period of two years (Piscopo, 2006). The subject is also offered in many church and independent schools from Form 1 until Form 5. TS is less popular as an optional subject and subject of specialisation. It is also predominantly chosen by female students.

The HE syllabus is divided into three main areas: Food, Nutrition and Health; Home and Family Living; and Choice and Management of Resources (Ministry of Education, Employment and the Family (MEEF), 2008a). The TS syllabus is divided into five main areas: Aids to Sewing; Textiles; Fashion; Creative Design & Work; and The Role of the Consumer (MEEF, 2008b). (A new National Curriculum Framework was released in 2012 and related syllabuses are being developed. The latter are taking a more thematic approach. See http://www.curriculum.gov.mt/secondary_syllabi.htm) Both syllabuses are designed to equip students with a useful range of skills and follow an integrated approach where inter-relationships between resources, individuals and society are addressed in both theoretical and practical contexts. HE and TS aim to give the students skills in decision-making, problem-solving, and organisation, communication and research among others.

The HE and TS syllabuses are conducive to constructivist learning theory or approaches (CLA), where emphasis is made on active learning through problem-solving and decision-making experiences. They seek to provide personal growth through experiential hands-on learning and practical experiences, which in turn support students in developing knowledge and skills in the use of resources, including technology. For example, HE teachers are sensitive to current household structures and in a constructivist approach the aim would be to guide students so that they can come up with their own definition/knowledge/experience of the family, changing family structures and roles of family members within the home and society.

The practical approach offers opportunities to use active methodologies which can prepare students to think about problems that need to be solved, to seek information, think critically, investigate a range of choices, manage their resources, express themselves with confidence, make judgements and decisions and evaluate their results (MEEF, 2008a, 2008b). The subject can lend itself to the integration of ICT and teachers need to support such a potential (Mugliett, 2009).

Based on local research on HE education (Mugliett, 2009), as well as from informal observations when conducting visits in schools, together with feedback from student teachers and discussions during professional development meetings with teachers, it is apparent that teachers may not be conscious of CLA. Teachers are utilising hands-on and investigative approaches in class due to the practical nature of the subject, but may not permit pupils to take on an active role in the classroom, especially during the theoretical component of the subject. It seems that very few are planning for learning experiences which will effectively be

constructivist. Learning experiences which increase the students' motivation and activity and are student-driven are not necessarily part of the general pedagogy in most HE classrooms.

HE teachers, as with teachers in other subject areas, need to be supported in making a shift towards using more CLAs in class, in ways which could enhance learning, consolidate understanding for students of all abilities and make learning fun (Mugliett, 2009). In a constructivist class, learning is socially constructed, active, reflective and collaborative (McCloat, 2008). In parallel, ICT could be used more effectively in HE teaching and learning. ICT can reach students of different abilities (NCET, 1994) by presenting information or activities in a graded and varied manner. Whilst technology is not an education panacea, it can support and extend teaching and learning through activities which offer new and interesting ways of developing skills (Dorner, Field, & Sparrowhawk, 2000).

From research carried out by Mugliett (2009), it seems that Maltese teachers of HE may think that the subject has enough hands-on experiences because of the practical and investigative component and, although they may have favourable attitudes towards more innovative pedagogies, they are not valuing these newer approaches as essential to take up. The relationship between ICT or CLA and HE offers challenges and opportunities locally with implications for Education Officers (the national subject co-ordinators responsible for one specific school subject), curriculum developers, teacher trainers and teachers (Mugliett, 2009). McCloat (2008) suggests that "ICT facilitates learners to actively construct their own knowledge and promotes autonomy and critical reflection" (p. 11).

An innovative Home Economics seminar centre

The Home Economics Seminar Centre (HESC) set up in 1992 forms part of the Curriculum Management and eLearning Department within the Directorate of Quality and Standards in Education. Over the years the centre has become an increasingly recognised educational entity that promotes wellbeing in various settings through the diverse services that it offers. The carefully designed programmes and seminars aim to address a number of HE-related topics which contribute to improved wellness through health-enhancing behaviours and an improved environment. The topics include areas such as breakfast, fruit and vegetables, healthy eating, healthy living, money management and environmental education. These are done through the various seminars including "A Healthy Breakfast for a Good Start", "*Gawdi Saħħtek u Saħħet Uliedek*" (Enjoy good health and good health for your children), "Aliens in Our Food", "Nutrition Alert", "The Savvy Shopper", "Be A Fruit and Veggie Champion", "Milk Power" and "Trendy Choices for Smart Teens", amongst others. The participants comprise children, adolescents, adults and senior citizens. One of the seminars on healthy eating and living is addressed at parents of primary school children who can accompany their children to the seminar centre for the day (HEiA, 2009).

Adults and senior citizens are also reached by the HESC through schools or through community events where the centre's services are requested by local councils, parish groups, mother and baby clubs and other NGOs. There are two programmes specifically targeted at the community: "Building Healthy Families" and "*Nimmaturaw b'Saħħitna*" (Ageing Healthily).

The HESC has a role to play in the implementation of the Healthy Eating Lifestyle Plan (HELP) which was published by the Education Division in 2007 as a document outlining guidelines for a healthy lifestyle promotion in schools (Ministry of Education, Youth and Employment, 2007). Within this document schools are encouraged to give high priority to healthy eating and a healthy lifestyle on their school agenda. The HESC offers guidance and support to schools and tuck-shop operators in implementing the strategies as described in the HELP document through a number of training activities, assistance in drawing up staff development plans and consultation sessions for teachers and school senior management teams.

The staff at the HESC has been able to accomplish a lot of work over the years since its inception, although a scientific evaluation of the impact of their different interventions has yet to be carried out. HESC has a good reputation among all vested stakeholders and this has been largely the fruit of effective teamwork and synergy among all the members of staff.

Assessment of HE and TS (Textiles and Design)

At the end of compulsory schooling (Form 5) and at post-secondary level students can sit for national exams. As of 1994, HE and TS are no longer assessed by a foreign examination board, such as through the Oxford Examination Board, but through a local board set up within the University of Malta. This MATSEC Board accredits students who pass with a Secondary Education Certificate (SEC) at school-leaving age and an Intermediate (IM) or Advanced (AM) Matriculation Certificate (two years after).

The HE SEC examination is made up of two written papers, contributing to 70% of the final mark, and a coursework component made up of multiple practical and investigative tasks which have a global mark of 30%. The TS SEC examination (actually called Textiles and Design) is also made up of two written papers, contributing to 60% of the final mark, and coursework comprised of investigative work, garment making and a portfolio which have a global mark of 40%.

An Intermediate HE examination has also been offered since 2003 and this is an equivalent to the Alternative Ordinary examination which past students used to sit for after their first year of their post-secondary schooling. The HE Intermediate examination is comprised of one written examination paper. It does not have a textiles component or focus.

The Advanced level Home Economics examination has been offered by the local examination body since 1996. It is currently comprised of two written examination papers worth 75% of the final mark. It also offers candidates the opportunity to conduct food and textiles-related production work, as well as investigative research as part of the coursework component which is worth 25% of the global mark.

Teachers and lecturers authenticate the students' coursework in-school and are moderated by examiners who are sent to the schools and post-secondary institutions by the University of Malta. The coursework component is regarded as a valid means of assessing students' investigative and practical skills and involves commitment on the part of the learners, teachers, lecturers and examiners.

Home Economics at the tertiary level

At the tertiary level, HE has always been offered within a teacher training programme. It was one of the areas of specialisation offered at the Mater Admirabilis female teacher training college in the mid-20th century. Later, in 1978, when the 4-year Bachelor of Education (Hons.) degree was established at the University of Malta, HE once again featured on the list of specialisations. A BA or a BSc in HE have not been offered to date, but this option is currently being considered by the University of Malta.

Since its inception, the B.Ed. (Hons.) HE degree has incorporated courses on topics traditionally associated with HE and which reflected what was being taught in schools locally (i.e., food, nutrition, consumer, household management, family living), as well as topics traditionally associated with TS as taught in schools (i.e., textiles science, construction of clothing and fashion design). Thus, the B.Ed. (Hons.) HE degree has always been very clearly geared towards training prospective HE and TS teachers.

This comprehensive remit has always been a challenging task! At the time of every annual programme review, what content to retain, remove or add to meet the intended programme outcomes is a constant dilemma. An appropriate balance needs to be achieved between substantive knowledge courses and methodology courses which are crucial in a teacher training programme. The correct sequencing of the courses is also paramount. This needs to match with the stage of the students' maturity within the programme, as well as their very practical needs when they start their field experience (Teaching Practice) in schools.

It seems that this curriculum-related programming dilemma is not limited to recent times, nor to Malta. To quote Bonser who was writing in 1923:

The curriculum of any course of training and instruction is determined by the specific purposes to be accomplished. The purpose definitely before us is that of preparing teachers to teach Home Economics. If this term represented a single and simple body of skills and related information to make these skills intelligent, the problem of the curriculum would not be difficult. But Home Economics is a very broad and inclusive term. We can make no headway without first analyzing the total content of the field into its more important elements. Not only do we find that the breadth of content of the field is great, but we also find that there are two distinct but closely related kinds of purposes to be served, one which we call a general education purpose, the other a vocational education purpose. While the material used in realizing both purposes is the same in many respects, the basis of both selection and method may be different. The broad range of the field and the two types of purposes thus make the problem of the curriculum particularly difficult. (para. 1)

Considering the above, the emphasis in the Maltese B.Ed. (Hons.) HE course has always been the vocational orientation - preparation to become teachers. Yet, inevitably, the element of education for personal growth - assimilation of new knowledge for personal lifestyle development - was also an integral part of the programme. This was seen as necessary in

order for the prospective teachers to be well-equipped with an appropriate depth of knowledge to have the confidence to teach the various topics, whilst at the same time encouraging them to make changes in their own lifestyle in order to be good role models, to be able to make reference to real life experiences, and to use a practical, problem-solving approach in their lessons.

Tables 1 and 2 present an overview of the 2010-2014 B.Ed. (Hons.) programme (University of Malta, 2010), with the various courses classified using an adaptation of Bonser's (1923) simple categories. The third column - Blend - indicates courses which combine substantive knowledge with pedagogy for teaching that knowledge.

Table 1 B.Ed. (Hons.) NFCS (Home Economics) 2010-2014 Programme (Part 1)

General		
General education	Vocational education	Blend
Introduction to Nutrition, Family & Consumer Studies	Communicative Aspects of HE	
Health and Safety for HE and Textiles Teachers	Planning HE Courses & Lessons	
Research Strategies in Nutrition, Family & Consumer Studies	Teaching Strategies in HE and Textiles	
	Using ICT in HE Education	
	Using Mass Media for HE and Textiles Education	
	Modes of Assessment in HE and Textile Studies	
	School Experience: Home Economics	
	Professional Development Portfolio (1): NFCS	
	Professional Development Portfolio (2): NFCS	
Food, Nutrition And Health		
General education	Vocational education	Blend
Principles of Human Nutrition incl. Foundation Science	Health and Nutrition Education	Principles and Applications of Food Science & Food Technology
Towards Healthier Living	Practical Skills in HE (incl. Food Handlers [Category B] Certificate)	Home and Environmental Health Issues
Applied Human Nutrition	Workshop in Practical Skills in Home Economics	Cultural and Scientific Issues in Health & Nutrition: Community and Lifelong Education Project
Nutrition and Dietary Planning for Individual Needs	Advanced Practical Skills in HE & Food Technology (incl. First Aid Certificate)	
	Advanced Workshop in Practical Skills in HE (incl. Fire Safety Cert)	

Table 2 B.Ed. (Hons.) NFCS (Home Economics) 2010-2014 Programme (Part 2)

Family And Resource Management		
General education	Vocational education	Blend
Family Well-Being from Pre- School to the Senior Years	Consumer and Financial Education	
Family Resource Management incl. Financial Management		
Housing and Interiors		
Scientific Principles and Applications in HE and Textiles		
Textiles And Design		
General education	Vocational education	Blend
Principles and Applications of Textile Science	Advanced Construction Techniques Used in Textiles	Application of Textile Design and Technology Principles and Applications of Construction Techniques Used in Textiles Designing Patterns and Clothing for Specific Purposes Costume History and Fashion Design

It must be noted that over the years there have been periods where additional orientations were incorporated in the programme, such as offering mini-specialisations in lifelong, adult and community education, or basic entrepreneurship; however, due to faculty-wide restructuring of the teacher training programme, these had to be discontinued.

An area which has been boosted in the current programme is the practical food preparation and cookery skills. During their Teaching Practice sessions, B.Ed. (Hons.) HE students were regularly being observed as lacking in these skills. Often, this was either because they had never had the opportunity to practise such skills during their secondary schooling as they had not chosen HE as an option or area of specialisation, or because it had been a while since they had practised such skills under formal professional supervision since the HE Advanced level examination they had sat for did not include a cookery component. (This changed in 2012 as a practical cookery component was included as part of the coursework.) Consequently, some new courses were added so that student teachers would have more hands-on practice and gain confidence in demonstrating preparation and cookery of a broad range of items involving different culinary skills and also to meet different dietary needs.

In recent years, B.Ed. (Hons.) HE graduates have also started being employed as Food and Textile Technology teachers in secondary schools. As a result, a few basic courses in these two fields have been introduced on the B.Ed. (Hons.) programme. Additional training on graduation is required to teach these two subjects effectively, given that they have an industrial/commercial orientation as opposed to HE and TS which have a personal development, consumer and family living orientation.

Shift from 'Home Economics' to 'Nutrition, Family & Consumer Studies'

In the early 2000s, the current HE lecturing team decided to consider a name change to the B.Ed. (Hons.) HE course. It was felt at the time that the name Home Economics was not offering a true picture of the scope and depth of the course. Due to prevailing misperceptions of HE in Maltese society in general (Casha, 2000), the name of the tertiary level degree was also loaded with certain stereotypes. For several years, the B.Ed. (Hons.) HE students had been calling for a name change, to give a “fresh” and “correct” image to the subject, at least at tertiary level.

After several intensive and lengthy discussions and consultations, involving lecturers, teachers, the Education Officer and student teachers, the name “Nutrition, Family & Consumer Studies” was chosen. The primary goal was to choose a name where the main foci of the BEd course were clearly spelt out. There was some debate as to whether to include “textiles” in the title; however, this idea was rejected because it was felt that Textiles was encompassed in both Family and Consumer, and also for a more technical reason - length of the title.

Importance was given to the sequence of the words in order to communicate the right message. After several discussions, “nutrition” was opted for as the first word rather than “family” or “consumer”. Historically, in Malta, nutrition education had always been primarily the remit of HE teachers. Moreover, the topic of nutrition was (and remains) very high on the public agenda and thus had good marketability and public image value.

One other key debate was whether to use the term “studies” or “science”. The B.Ed. (Hons.) programme was (and still is) housed within the Department of Mathematics, Science and Technical Education. Therefore, Science was initially seen as a justified choice. However, two key counter-arguments were raised based on course philosophy and public interpretation. Firstly, the term science was actually considered restrictive: whilst on the one hand it emphasised the positivist and eco-systems angle, on the other hand it de-emphasised the critical and emancipatory angles of the course. Secondly, the term science was seen as a potential barrier to recruitment. Although the name change was being discussed for the tertiary level, many around the table were looking ahead as to its possible adoption in the lower levels of the educational system. It was felt that the term science would discourage some teenagers from choosing the subject at secondary level.

The new name was approved by Senate and officially adopted in October 2007. For about two years, Nutrition, Family & Consumer Studies (NFCS) was used alongside Home Economics in order to emphasise that the former was a new name for the latter. This transitional strategy was seen as necessary. Now, five years later, NFCS seems to have been assimilated well within the university administrative structures and discourse and NFCS is being used uniquely.

Launching the MEd Health, Family & Consumer Studies

Up till the mid-2000s the options for studying HE at postgraduate level were limited. One either had to study overseas, or else follow a local MEd general degree and then carry out the research component in a HE area. Both options were taken up by graduates of the B.Ed. (Hons.) HE degree.

The need for a local MEd in the discipline was sorely felt by the current lecturers, and the demand was also very high from B.Ed. (Hons.) (HE) graduates. The Faculty of Education leadership were supportive of the idea, seeing this as a vehicle for increasing the pool of NFCS lecturers with a Master's degree in the discipline, as well as contributing to further professionalisation of the discipline in Malta.

An MEd in Health, Family & Consumer Studies (HFCS) was launched in 2008. Its target audience was primarily HE educators, although other educators from related disciplines were also considered as potential students. The term "health" instead of "nutrition" was used purposefully in the title: The degree aimed at offering a broader understanding of health as it related to the wellbeing of individuals, families and communities. In fact, the degree also introduced an emphasis on sustainability in the various courses. The following is the general aim of the MEd HFCS:

The MEd Health, Family & Consumer Studies (MEd HFCS) offers an advanced level, multi-disciplinary programme which is targeted at educators seeking to

- a) Upgrade their knowledge in the fields of health, nutrition, consumer and sustainability issues;
- b) Improve their pedagogical and communication skills;
- c) Familiarise themselves with the process of policy development and;
- d) Develop and practise programme planning, implementation and evaluation. (University of Malta, 2008)

In general, the new MEd (HFCS) served to provide students with a more advanced understanding of health, nutrition and consumption topics, with sustainability as a unifying thread. It also sought to upgrade students' pedagogic, communication, research and evaluation skills. A guiding premise for the degree was that NFCS and HE educators should act as change agents not only within the classroom setting, but also beyond - in the community and possibly at policy level. Table 3 outlines the MEd (HFCS) programme which is comprised of 30 ECTS (European Credit Transfer System [ECTS] 1 ECTS= 7 lecturer-student contact hours and 25 hours of independent work) taught courses and 60 ECTS made up of a dissertation based on original research.

Table 3 M. Ed. Health, Family & Consumer Studies

Course	ECTS ^a
Educational Research: Critical Issues	5
Educational Research: Basic Methods	5
Contemporary Issues in Health, Nutrition, Consumption and Sustainability	5
New Pedagogies: Application in Health, Nutrition, Family and Consumer Education	5
Promoting Well-being: Evaluation of Programmes and Interventions	5
Communicating about Health, Nutrition and Consumer Affairs: Engaging with the Public and with the Policy Makers	5
Dissertation	60

Source: University of Malta (2008).

^a1 ECTS = 7 contact hours and 25 hours independent learning (or equivalent)

At the time of writing this paper, preliminary discussions were underway for adapting or augmenting this degree to a European Masters in the discipline. Incorporating the European dimension within the various courses would give added value to the programme content, promote transnational tertiary education, as well as nurture a better appreciation and understanding of issues pertaining to individual, family and community wellbeing across Europe.

A professional association

Like fellow Home Economists around the world, over the years Maltese Home Economists have also acknowledged the value of being united in a professional association (Piscopo & Zammit, 2008). The year 1974 saw the launching of HENTA - Home Economics and Needlework Teachers Association - which was the first local professional association for the disciplines. HENTA was very active for many years, organising different continuing education activities for its members and building a library of books and resources for teachers to loan. For a while the association was less active, till it dissolved in the mid-1990s.

In 2002, a group of recent B.Ed. (Hons.) HE graduates were inspired to set up a new association called HEiA - Home Economists in Action. The overall aims of the association were to offer members different opportunities and tools for them to keep abreast of latest developments in the various topics taught in HE and TS in schools, to assist members in enhancing their teaching abilities, to organise events for schoolchildren, and to further promote HE and TS among the general public. HEiA's key objectives can be seen in Figure 1.

HEiA Objectives

- To provide a national focus for NFCS, Home Economics & Textiles Studies
- To enhance the level and effectiveness of Home Economics and Textiles Studies education in Maltese state, church and independent schools
- To promote quality health, consumer, family, textiles and environmental education among Maltese youth
- To promote equality, human rights and appreciation of diversity among youth
- To plan and organise innovative activities aimed at promoting a better quality of life for youth and their families
- To facilitate members' professional development by helping to keep them informed on the latest local and international research and innovations related to the field
- To encourage collaboration between members through the sharing of resources
- To organise social outings for members
- To maintain a strong network between the University student members and young BEd (Hons) NFCS graduates
- To promote public understanding of NFCS, Home Economics and Textiles Studies.

Figure 1 The objectives of HEiA. Adapted from "Our objectives", HEiA (n.d.).

HEiA is very active. It regularly organises presentations, talks and field visits for its members, which it occasionally also opens up to the general public. These educational activities have ranged, for example, from a presentation on diabetes and young children, to a talk about wine and health and a wine appreciation activity, to a visit to a local organic farm including olive oil tasting.

In 2006-2007, HEiA also organised a national Healthy Snacking Poster Competition in schools, which was very successful and which resulted in a calendar being distributed to all secondary schools in Malta which depicted the winning posters and healthy snacking slogans.



Figure 2 Healthy Snacking calendar: Front and back views.

HEiA also issues a quarterly newsletter - News to Use - which comprises articles on topics of interest, members' experiences, member-organised activities in schools, HEiA activities, as well as educational resources which can be used in HE or TS lessons in secondary schools.

Since 2007, HEiA has also been an active partner in the DOLCETA European project, which is an online consumer education website (www.dolceta.eu) (Piscopo, 2010). HEiA members have authored over 200 pages in the informational section of the website dedicated to sustainable consumption. They have also developed over 50 lesson plans and a wealth of accompanying teaching and learning resources, which target primary, secondary and adult students and which have a HE link. Topics covered fall in the categories healthy and safe consumers; sustainable consumption (at home, in personal hygiene and dress, in food and drink intake,

when using transport); using services; and financial literacy. All materials were developed with the local context and local school syllabuses in mind and are downloadable for free from the DOLCETA (Malta) website.

HEiA is also very active in promoting HE as an essential school subject. At various points it has lobbied with the Ministry of Education, with politicians, with Heads of Schools and with parents to explain the benefits of a HE education. Recent research has shown that the public understanding and appreciation of HE as a school subject has improved (Gerada, 2009). However, marketing of HE is seen as a necessary ongoing activity. Demonstrating the value of HE in developing healthier and wiser citizens and consumers is seen as a fundamental goal.

Conclusion and the way forward

Maltese HE professionals have always been a proud and enthusiastic group. They believe strongly in the worth of their discipline. They appreciate that whilst its focus is ultimately the well-being of individuals, families and communities, the emphases in school syllabuses, the teacher training programme and professional development opportunities need to change according to societal trends, emerging family lifestyles and research on effective pedagogy.

A number of HE professionals are using the mass media, including TV, radio, newspaper and magazine articles, books, the internet and social media to disseminate HE knowledge and skills, as well as to enhance public awareness of what HE *is all about*. Informal observation suggests that synergistically these efforts are leaving a positive impact, especially with respect to public acknowledgement and appreciation of the HE profession.

HE is considered a very dynamic discipline by those who teach and live it; but much work has yet to be done in Malta to further enhance the public image of the discipline, to ensure that all teachers adopt a student-centred and constructivist approach in class, and to facilitate the integration of HE as a subject for all across all levels of compulsory schooling.

Biography

Suzanne Piscopo is Senior Lecturer on Nutrition, Family & Consumer Studies at the University of Malta, conducting teacher training in the BEd and MEd courses and lecturing on food, nutrition, education and communication in other diplomas and degrees. She is founding member and Chairperson of 'Home Economists in Action' and has served on various national and international Boards related to food, nutrition and consumer education. Suzanne frequently writes and presents on the local mass media, is on the Board of Editors of the Consumer department's 'L-Għażla' (The Choice) magazine, and has authored two series of children's stories about healthy eating. E-mail: suzanne.piscopo@um.edu.mt

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Karen authored the award winning book *Seasonal and Sustainable: Cooking for Healthy Living* (2010). Karen has been involved on various international (EAHE) and national boards in relation to nutrition, health and education. Karen can be reached by e-mail at: karen.mugliett@um.edu.mt

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Women's perceived influence of stress on their dressing and eating behaviours

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Abstract

People are more prone to stress if they try to juggle multiple responsibilities. As a coping mechanism, they may comfort themselves by disregarding their appearance and making unhealthy food choices. The purpose of this study was to investigate whether perceived stress influenced dressing and eating behaviours of females. A validated and reliable 48 itemized survey was used to assess demographics, effort put forth to control dressing and making healthy eating choices, patterns of dressing and eating when stressed, and dress items worn and foods eaten when under non-stressful and stressful conditions. Analysis of responses from 542 women revealed that during stressful conditions there was a statistically significant decrease in the selection of accessories, formal dress, make-up, hair maintenance, and use of body lotions/fragrance, and an increase in mixed dishes, salty/crunchy foods, sweet foods, and beverages when compared to non-stressful conditions. The results suggest that when stressed, these women reported they dressed informally and selected a larger variety of foods.

Introduction

Research with adults indicates that stress can occur with physical, emotional, interpersonal or psychological changes (O'Connor, Jones, Conner, McMillian, & Ferguson, 2008). Several factors, such as economic status, personal relationships, and work have contributed to increasing stress levels in the United States (Helm, Laussmann, & Eis, 2010; Hitti, 2007; Rentfrow, Mellander, & Florida, 2009). There has been some supporting evidence indicating that stress is associated with alterations in food choices and dressing habits (Habhab, Sheldon, & Loeb, 2009; Hepworth, Mogg, Brignell, & Bradley, 2010; The American Institute of Stress, 2008).

When compared with men, women reported experiencing higher levels of stress (Rice & Van Arsdale, 2010). Generally, women have a nurturing disposition and often take an active role in ensuring the physiological and psychological needs of families are met (Hayes *et al.*, 2010). A common coping mechanism used by women to overcome stress includes neglecting their appearance and making unhealthy food choices (Habhab *et al.*, 2009; Hepworth *et al.*, 2010; The American Institute of Stress, 2008), thus predisposing themselves to various health risks (O'Connor *et al.*, 2008). Specifically, Habhab *et al.* (2009) noted in a female population ($n = 40$) that those who were stressed preferred sweet, high-fat foods and women who were not stressed ate more low-fat foods than high-fat foods. Hepworth *et al.* (2010) found that among 80 young women, mood influenced attitudes about food, including motivation for food. Those with a negative mood tended to show biases for food and subjective choices. Dress has been examined less frequently in research articles. However, The American Institute of Stress

(2008) notes that one of the 50 common signs of stress among both men and women is neglecting one's appearance, as well as alterations in appetite.

Based on the review of literature, there appears to be a relationship between clothing and/or food and its emotional influence on an individual (Habhab *et al.*, 2009; The American Institute of Stress, 2008). There are four aspects that affect the perception of clothing and its ability to comfort emotions: physical and functional, physiological, and psychological (Cheng & Cheung, 1994; Cho, 2006; Sarkar, 1994). Although these features can be distinct, sometimes they may overlap (see Figure 1).

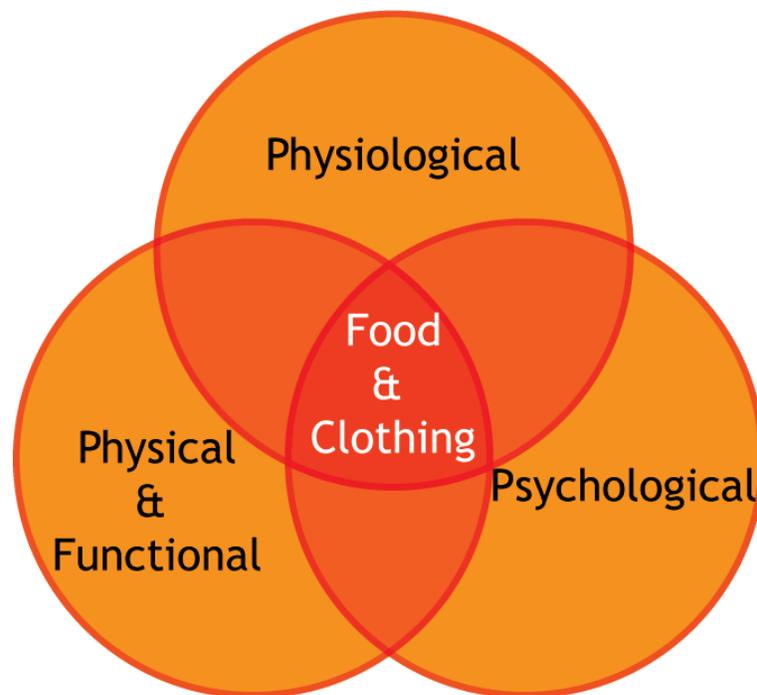


Figure 1 Overlapping of physiological, physical and functional, and psychological aspects of food and clothing

Psychological aspects of food and clothing

Perceptions of mood have influenced dressing patterns, appearance, food selections, and consumption behaviours. A preliminary study performed by Kandiah and Saiki (2010) found that dressing and food selection behaviours of 51 females varied from perceived stressful to non-stressful conditions. From non-stressful to stressful conditions there was a significant decline in participants' preference to wear accessories, dress formally, maintain hair, apply make-up, and use fragrances (scent). Additionally, there was a significant increase in consumption of beverages and sweet foods. However, differences were not reported in the consumption of mixed dishes, salty foods, and creamy foods.

According to Johnson, Francis, and Burns (2007), groups with certain personality traits (e.g., high anxiety and stress) have monitored their appearances closely. Similarly, those with composed personalities gave greater attention to their appearance. Implications of the

research were that anxious people manage their appearance to relieve stress, while those with composed personalities exhibited appearance management behaviours for social reasons. Cho (2006) asserted that aesthetic considerations of hospital gowns could “enhance a patient’s recovery process by lessening negative feelings of tension, stress, anger, or psychological depression” (p. 335). Colour has been reported in discussion of mood. Research has shown that warm colours tend to elicit enthusiasm and cool colours stimulate relaxation (Yildirim, Hidayetoglu, & Capanoglu, 2011). Confidence or a positive mood related to wearing appropriate workplace dress has been investigated. McLeod (2003) reported on the effectiveness of a workplace dress programme known as Fashion Takes Action, conducted in 10 USA cities by Sears Roebuck Company in 2000. Upon completion of this workplace dress programme, participants reported increased confidence in their work skills.

Legel, Lu, and Dube (2008) examined comfort food preferences and consumption patterns of women with different emotional tendencies. Food consumption was associated with negative feelings, concerns about weight gain, and satisfying an emotional void. The pleasure attributes of food were also used for comforting. Wansink, Cheney, and Chan (2003) found that males when stressed preferred warm, hearty, meal-related comfort foods, while females preferred sweet, snack-type foods. Using a five comfort-food category survey to assess the effects of stress on eating habits of female college students, Kandiah, Yake, Meyer, and Jones (2006) found that stress triggered a change in appetite (81%; $n = 221$) with the majority of the subjects (62%; $n = 139$) experiencing an increase in appetite. This resulted in increased selection of sweet foods and mixed dishes. Kandiah, Yake, and Willett (2008) later found that among an older female population (≤ 55 and > 55 years), participants selected fewer types of food from the comfort food categories (i.e., mixed dishes, salty/crunchy foods, sweet foods, creamy foods, and beverages), with the exception of beverages, than males when stressed. Both females and males said that when stressed, they chose a variety of sweet and salty/crunchy foods. Zellner, Saito, and Gonzalez (2007) found that when offered a choice to eat M&M chocolate candies and potato chips versus grapes and peanuts, men chose healthier snacks (grapes and peanuts) at times of stress. These findings were not congruent for women, in that women tended to eat more grapes when under non-stressful conditions and more M&Ms when stressed.

Physical and functional characteristics of clothing

Physical characteristics of a garment comprise of design, material, construction, and finish (e.g., type of fabric, colour, texture, etc.). Performance or functional characteristics of clothing is what the garment does (e.g., tactile, elasticity) (Brown & Rice, 2000). These two characteristics of clothing have assisted in the coping of stress by providing comfort to the wearer.

There is supporting evidence that stretch of a fabric and fit of a garment influences perceptions of comfort. Mitchka, Black, Heitmeyer, and Cloud (2009) found size and fit were important to dancers. Lamb and Kallal (1992) used a model in which function was defined as protection, thermal comfort, fit, and ease of movement. These needs of a wearer vary by situation. For example, medical personnel pressed for time will desire a gown that is easy to untie to access parts of a patient’s body (Truitt & Southwell, 1992).

Physiological characteristics of clothing and food

Physiological features associated with clothing and comfort encompass temperature, touch, and garment fit, such as the soft feel of a sweatshirt fabric or the protection that a wool jacket provides from the cold. In technical design, comfort properties can be associated with the ability of the fibre to keep the body comfortable in warm or cool climates. Some properties include cotton fibre which keeps the body cool during warm days by absorbing moisture (Kadolph, 2007). Cotton is generally used in casual clothing (e.g., sweat shirts, sweat pants, and jeans) and is perceived comfortable for active clothing (Morris, Prato, & White, 1984). In contrast, wool has a formal appearance (e.g., suits and winter dress coats) and keeps the wearer warm (Brown & Rice, 2000).

Physiological stress interventions using animal models have demonstrated that some foods (e.g., low sucrose drinks) reduce neuroendocrine, cardiovascular, and behavioural responses to stress (Ulrich-Lai *et al.*, 2010). Dallman *et al.* (2003) examined chronic stress with glucocorticoids, a steroid anti inflammatory hormone that is involved in the metabolism of macro nutrients. In rats, elevated glucocorticoids stimulated ingestion of comfort foods, specifically sucrose and fat resulting in weight gain. Lemmens, Born, Martens, Martens, and Westerterp-Plantenga (2011) investigated the consumption of high-protein and high-carbohydrate meals on physiological hormonal and psychological mood responses among males and females. Consumption of high-protein versus high-carbohydrate meals was not associated with feelings of depression, tension, anger, and anxiety.

Although independent relationships exist among food, clothing, and stress and the association with psychological, physical and functional, and physiological aspects, to date no research has examined the interrelationships of food and clothing and stress as they impact women. Therefore, the purpose of this research was to examine how perceived stress influences dressing and eating behaviours of females.

Methods

Participants

From a pool of 9,325 females at a Midwestern university, a stratified random sample was selected to complete the 48 itemised Stress Dressing and Eating Survey (SDES). For a 95% confidence interval with a 5% margin of error, the required sample size should be 383 (Israel, 2009). Participants were divided and data analysed based on relationships regarding perceived stressful/non-stressful conditions, and induced dietary and dressing changes.

Measures

The 48 itemised SDES developed by the researchers was used for this study. The SDES was divided into four sections, namely demographics, effort put forth to control dressing and making healthy eating choices, patterns of dressing and eating when stressed, and dress items worn and foods eaten when under perceived non-stressful and stressful conditions. Validity of the SDES was assessed by 10 professionals, 5 in fashion and 5 in foods and nutrition. Using a test-retest, reliability was verified by administering the instrument electronically to a convenience sample of female college students from a Midwestern university. Test-retest was

performed because the items in the scales were heterogeneous rather than homogeneous by design (Kandiah & Saiki, 2010).

To assess effort put forth to plan, control, and maintain dressing and eating, a 4-point Likert scale (ranging from great, considerable, some, and little/no) was used. A series of yes/no questions were used to identify dressing and eating patterns when stressed. Types of clothing, accessories worn, and dress habits as defined by Eicher and Roach-Higgins (1992) when under perceived normal and stressful conditions was assessed utilizing 22 multiple choice questions. Dress-related categories included accessories, informal dress, formal dress, make-up, hair, scent, and appearance services. The food-related questions included beverages, mixed dishes, salty/crunchy, sweet, and creamy foods, similar to those questions previously utilized by Kandiah *et al.* (2008). Each multiple choice question under the dress and food category had between 6 and 9 items from which participants were allowed to select as many as were applicable. For example, in the formal dress category items from which participants could select included hosiery, suits, dresses, closed-toed shoes, blouses, dress pants, and skirts. An example in the food subcategory of creamy foods included yogurt, pudding, peanut butter and jelly, pasta, grilled cheese, soups/stews, and mashed potatoes. Since it was not feasible to incorporate all possible clothing and food items, each subcategory had a space for "other" for participants to include items that were not listed.

Procedure

Upon approval from the University's Institutional Committee on Investigations Involving Human Subjects, females at a Midwestern university were invited to complete the SDES that was posted on the Internet using inQsiti software (version 9.3 2009; Fortriede & Draper, 1996). On the day the study became available, female students selected through stratified random sampling received an e-mail from the researchers through a university account inviting them to participate in the research. Subjects were also provided information on how to access, complete, and submit the online survey. Participants were given one month to complete the survey, after which the survey was no longer accessible to them.

Analysis

Statistical analysis was performed using Predictive Analytic Software (Version 18). Frequencies were calculated for the following: demographics, effort put forth to control dressing and making healthy eating choices, and patterns of dressing and eating when stressed. For the remaining sections of the SDES, dress items worn and foods eaten when under non-stressful and stressful conditions, paired sample t-tests were used to compare dressing and eating behaviours during perceived non-stressful and stressful conditions. A p value of <0.05 was considered statistically significant.

Results

Demographics

Five-hundred and forty-two females successfully completed the study. A vast majority of the females were between 18-22 years ($n = 405$; 75%). Another 16.7% ($n = 90$) were between 23-30 years. Years in college reported by participants were as follows: first 26.3% ($n = 140$), second 20.6% ($n = 110$), third 19.3% ($n = 103$), fourth 12.6% ($n = 67$), and fifth 21.2% ($n = 113$). The majority of the females were Caucasians (90.5%; $n = 487$). Body mass index (BMI) is a person's weight in kilograms divided by their height in meters squared; according to the National Heart, Lung, and Blood Institute (2011), normal BMI is classified as 18.5 to 24.9, values 25 to 29.9 are considered overweight, and greater than 30 is obese. Since it was not feasible to calculate actual BMI of participants, self-reported mean BMI indicated that participants were in the upper category of normal BMI (24.9). As would be expected with this population, 77.3% ($n = 419$) were single and 19.8% ($n = 107$) were co-habiting, engaged, or married. Regarding living arrangements, 49.1% ($n = 266$) stated they were residing with non-family members implying they could be living in apartments or dormitories.

Effort put forth to control dressing and making healthy eating choices when stressed

The majority placed some (53.8%; $n = 291$) to considerable (27.4%; $n = 148$) effort to maintain their appearance. Under normal circumstances, 41% ($n = 222$) placed considerable and 30.9% ($n = 167$) placed some effort in controlling their eating by managing calorie intake and food choices and by reading food labels. The majority indicated that they placed some to considerable effort in planning and maintaining what they wear.

Participants' responses about dressing and eating habits when stressed are shown in Table 1. Interestingly, more people reported dressing formally and fashionably when stressed. However, eating habits were not affected by stress. Neither eating or dressing, nor time in preparing food or getting dressed, was a factor in relieving stress (see Table 1).

Table 1 Participants responses to questions about eating and dressing habits when stressed

Question	Yes*	No*
Trying to look better	54.2%; $n = 292$	45.8%; $n = 247$
Dresses formally (heels, suits, etc.)	90.2%; $n = 487$	9.8%; $n = 53$
Dresses fashionably	67.3%; $n = 365$	32.3%; $n = 174$
Dresses casually (t-shirts, jeans, etc.)	4.8%; $n = 26$	95.2%; $n = 514$
Makes healthy eating choices	59%; $n = 319$	41%; $n = 222$
Eats to relieve stress	29.6%; $n = 160$	70.4%; $n = 380$
Change in appearance to relieve stress	48.5%; $n = 262$	51.5%; $n = 278$
Less time than ordinary preparing food	32.0%; $n = 173$	68.0%; $n = 367$
Less time than ordinary getting dressed	37.4%; $n = 202$	62.6%; $n = 338$
Less time enhances appearance	37.1%; $n = 200$	62.9%; $n = 339$
Change in appetite	83.0%; $n = 447$	17.0%; $n = 91$

*From a pool of 542, some participants did not respond.

Patterns of dressing and eating when stressed

Analysis of paired sample t-tests demonstrated that changes in dressing and food behaviours occurred between perceived non-stressful to stressful conditions. During perceived stressful conditions, there was a statistically significant difference in the selection of informal dress items ($t = 2.66$, $df = 533$, $p = 0.008$) and mixed dishes ($t = 3.55$, $df = 525$, $p < 0.001$), salty/crunchy foods ($t = 3.30$, $df = 509$, $p = 0.001$), sweet foods ($t = 9.26$, $df = 522$, $p < 0.001$), and beverages ($t = 6.67$, $df = 517$, $p < 0.001$). There was also a statistically significant decrease in the selection of accessories ($t = -15.54$, $df = 467$, $p < 0.001$), formal dress ($t = -11.96$, $df = 337$, $p < 0.001$), make-up ($t = -15.21$, $df = 415$, $p < 0.001$), hair maintenance ($t = -19.56$, $df = 432$, $p < 0.001$), and use of body lotions/fragrances ($t = -13.48$, $df = 430$, $p < 0.001$). Although perceived stress influenced selection of creamy foods, the relationship between perceived stressful and non-stressful conditions was not statistically significant ($t = -1.81$, $df = 504$, $p = 0.071$). College students may have different social and daily expectations from those of working adults as to what is regarded formal versus casual (see Table 2).

Table 2 Differences in participants' dressing habits from perceived stressful to non-stressful conditions

Variable	Stressed Mean	Non-Stressed Mean	Mean Changes	T-test	Significance
Dressing					
Accessories	2.15	2.97	-0.83	-15.54	0.000*
Informal dress	6.13	5.97	0.16	2.66	0.008*
Formal dress	2.76	3.67	-0.91	-11.96	0.000*
Make-up	2.51	3.56	-1.05	-15.21	0.000*
Hair	2.09	3.09	-0.99	-19.56	0.000*
Scent	1.72	2.18	-0.45	-13.48	0.000*
Appearance services	1.65	1.88	-0.23	-5.79	0.000*
Food					
Mixed Dishes	4.02	3.74	0.29	3.55	0.000*
Salty/Crunchy	3.14	2.96	0.18	3.30	0.001*
Sweet foods	3.41	2.85	0.56	9.26	0.000*
Creamy foods	4.19	4.32	-.013	-1.81	0.071*
Beverages	2.72	2.39	-.32	6.66	0.000*

* $p < 0.05$

Discussion

Findings support previous research that during stressful conditions, people tend to dress more informally, wearing fewer accessories, formal dress, make-up, and perfume, and paying less attention to hair (Kandiah & Saiki, 2010). There was disparity in the foods selected during stressful conditions between the current and the previous research where the sample population comprised of only 51 participants. The present research indicated from non-stressful to stressful conditions there was increased consumption of mixed dishes, salty/crunchy, and sweet foods.

A vast majority of participants indicated they dressed formally (90.2%) and fashionably (67.3%) when stressed, implying that creation of a positive mood appears to take priority over functional dress (Cho, 2006; McLeod, 2003). However, when questioned about specific dressing items worn during non-stressful to stressful situations, participants identified wearing informal, physically and physiologically comfortable dress items (e.g., jeans, t-shirts made from cool cotton) (Brown & Rice, 2000; Kadolph, 2007). There was also decreased selection of formal dress items from non-stressful to stressful conditions. A possible speculation for this contradiction may be attributed to participants' perception of what is defined and considered formal dress. Since interpretation of fashionable clothing is subjective, participants may have considered informal dress items as fashionable dress. Another explanation is that participants may ideally think they are dressing formally and fashionably during stressful conditions, but in actuality may fall short of these expectations.

In relationship to perceived stressful conditions and time involved in dressing, enhancing appearance, and preparing food, in all circumstances, more than 60% of the participants reported that stress did not have an impact on the time spent on these activities. On the contrary, paired t-tests revealed that participants spent less time dressing when stressed by using less make-up, wearing less perfume and accessories, and using less appearance enhancement services.

Findings from this study are congruent with those of other researchers in that stress triggered a change in appetite (83%) with the majority (52.2%; $n = 283$) having experienced an increased appetite (Kandiah *et al.*, 2008). Data from the previous study encompassed both genders and two age groups, namely 55 or younger and 56-plus with 62% ($n = 139$) experiencing an increased appetite when stressed. Unlike the 2008 research, the current population included young women (18 to 22 years) who may be vulnerable to controlling their appetite for weight maintenance and beauty ideals.

Research related to psychological and physiological aspects of food in men have demonstrated that they prefer warm hearty meals when stressed (Lemmens *et al.*, 2011; Wansink *et al.*, 2003). Similar observations were noted in this study encompassing females in that the types of creamy foods offered included both warm and cold dishes. Although items to select under the mixed dishes category could be considered warm and hearty foods, females selected more of these foods when they shifted from stressful to non-stressful conditions. This implies that when women experience perceived stress, they have a tendency to select a variety of foods.

This research is unique because it (a) demonstrates the relationships between perceived stress to eating and dressing behaviour, (b) allows for the utilization of specific interventions to change eating and dressing behaviours for a healthy life style, (c) includes a substantial sample of young females, (d) examines various categories of food and clothing, (e) integrates multidisciplinary areas of research that have not been explored previously, and (f) provides the foundation for further research about dressing and eating habits. Future recommendations for research include developing a survey to compare dressing and eating habits of men during stressful and non-stressful conditions, and assessing a varied age group to provide further insight as to how perceived stress influences dressing and eating

behaviours. Other populations with medically diagnosed stress disorders (e.g. Post Traumatic Stress Disorder) could also be surveyed. Responses to the "other" category in the survey indicate that this section needs to be expanded to include additional items, such as water under the beverage category. A food/dressing journal, where participants document stress states, dressing and food habits, may also serve as a resourceful instrument to reconfirm perceived habits.

Biography

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Meet the Dutch downshiffters: How people adjust consumption expenditures, experience downsizing and contribute to sustainability.

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Abstract

The paper presents results of an extensive quantitative and qualitative socio-economic study of Dutch voluntary and involuntary downshiffters. The paper presents changes in consumption with results of the study of the Dutch downshiffters. After a description of the profile of the Dutch downshiffters and their foreign counterparts, the paper elaborates on the changes in consumption practices. Further, the negative and positive experiences with living with less money are presented. The paper concludes with a discussion whether and if so, under which conditions, living with less could contribute to sustainability.

Keywords: Downshiffting; Home Economy; consumer behaviour change; sustainable lifestyle.

Introduction

Despite the increasing awareness that a more sustainable way of living is needed, living with less is generally considered an inconvenient option. The current viewpoint is that the hedonistic and materialistic mentality of people would be too serious an obstacle for change. This paper however presents this vision, referring to the rapid growth of the new consumer movement and the sustainability movement in the First World. There are strong indications that a fundamental change towards a less consumerist and more restrained way of life is taking place (Datamonitor, 2003; Etzioni, 1998; Gandolfi & Cherrier, 2008; Ray & Anderson, 2000; Schor, 1998). The number of people dissatisfied with their lives and longing for a simpler, less stressful existence is even higher, according to Datamonitor (2003). Also the sustainability movement has growing support. The results of the second annual National Geographic/GlobeScan Greendex survey (2010) showed that, over the past year, consumers have adopted more environmentally friendly behaviour which has led to a general increase in Greendex scores. Because the Greendex measures the behavioural practices of citizens in 17 countries in both the developed and the developing world, the results indicate that growing numbers of citizens are not only convinced that measures should be taken to preserve the planet but that they are also willing to adjust their behaviour toward a more sustainable lifestyle.

What lessons can be learned from the new consumers, in particular the downshiffters? Here lies the starting point of this paper, which addresses the question: Can living with less contribute to sustainability? The paper discusses results of a qualitative and quantitative study of downshiffting conducted in the Netherlands, the first study to examine living with less money from an experiential and practical perspective. The study goes beyond sustainable consumption as it explores opportunities for a sustainable lifestyle, which we conceptualised

analogously to the triple bottom-line of corporate social responsibility. In line with Callenbach's (1990) green triangle we proposed the Dutch Triple Gs of a sustainable lifestyle: *geld* (money), *groen* (eco-friendliness) and *gezondheid/welzijn* (health-wellbeing). This view posits that a sustainable lifestyle results from putting the right input into each of the three pillars. The basic assumption is the concurrence between the pillars and their mutual interdependence: changes in one influence the outcome of the other two. With this theoretical construct we could explore the connection between finances, quality of life, use of resources and other variables of sustainable consumption, resulting from our empirical research.

The paper begins with results of the study of the Dutch downshifters. After a description of the profile of the Dutch downshifters, sustainable and responsible consumption practices are discussed, including the negative and positive experiences with living with less money. The paper concludes with a discussion of perspectives for sustainable living.

The Dutch downshifters

Early in 2007 a survey was conducted among the readers of the Dutch magazine *Genoeg*, a bimonthly publication focusing on consuming less and sustainability. The study was part of the research project *Living with Less* which intended to explore new possibilities for sustainable consumption. The readers of the magazine were recruited as they were assumed to be representative downshifters. The survey (see Table 1) covered 1006 participants (13.35%) and comprised three groups: voluntary downshifters ($n = 461$), involuntary downshifters ($n = 280$) and non-downshifters ($n = 265$).

In this study, downshifting is simply defined as a reduction in spending, including both a voluntary and involuntary dimension. So downshifters are people who are living with less money than they did before, regardless of whether the change is voluntary or involuntary. The total number of participants that met the criterion for downshifters ($n = 741$) were further classified as either voluntary or involuntary downshifters. In total, 55% of all downshifters changed their expenditure patterns after a reduction of income ($n = 422$) while 34% opted to downshift despite experiencing no change in income ($n = 260$). Surprisingly, an additional 11% choose to downshift after an increase in income ($n = 87$). Of those who experienced a reduction in income, this reduction was voluntary for 29% ($n = 114$). The respondents who experienced a decrease in household income and answered no to the question of whether voluntary choice was the reason for the decrease, were classified as involuntary downshifters ($n = 280$).

Table 1 The Sample

	N	%
Voluntary downshifters	461	46
Involuntary downshifters	280	28
Non-downshifters	265	26
Total	1006	100

Of this population, we collected a series of characteristics, whose main ones were weighted to construct a representative image of the Dutch downshifters. The resulting profile will be presented below, followed by the sample data of downshifting practices, their experiences and attitudes. These data are the building stones to answer the central question - can downshifting contribute to sustainability? - which will be addressed in the final part of this paper.

Demographic characteristics

For the total sample, data on sex, age, education and paid employment were adjusted to represent the Dutch population. This was done as follows. First, sample data on sex and age were compared with the Statistics Netherlands 2008 data on gender and age for Dutch people between 20 to 80 years. In the total sample there were relatively more women, especially between 41 to 50 years, and relatively fewer men, especially between 20 to 40 years. The following weights were calculated: Men: 20 - 40 years: 6.45; 41 - 50 years: 2.43; 51 - 80 years: 2.9. Women: 20 - 40 years: 0.74; 41 -50 years: 0.38; 51 - 80 years: 0.64. Then, the weighted data for downshifters were compared to the overall Dutch population.

As shown in Table 2, the Dutch downshifters had a relatively higher level of **education** (60%) than the Dutch population. Around 40% had low to intermediate educational attainment. They were more frequently between the **ages** of 20 and 40. Downshifters were also more frequently **female** but the difference from the general population was small. Net **incomes** were less than € 1850 per month. Further, downshifters were more frequently engaged in paid **employment**, particularly part-time work. The percentage of downshifters with a full-time job (a workload of 40 hours per week or more) was far below the Dutch average. Finally, downshifters generally tend to have more children and are more likely to live in cooperative housing projects or have a different type of **household** than the average Dutch population.

Table 2 Demographic Characteristics (weighted)

		Downshifters % <i>n</i> = 741	Non-downshifters % <i>n</i> = 265	General population %
Sex	Male	48	55	50
	Female	52	45	50
Age	20-40	42	33	37
	41-50	21	24	24
	51-80	38	43	40
Education	Low - intermediate	41	33	75
	High	59	68	25
Paid employment	None	33	26	38
	<10 hrs	3	2	4
	10-20 hrs	8	8	6
	20-30 hrs	15	16	9
	30-40 hrs	28	31	21
	>40 hrs	12	18	22

Dutch downshiffters and their foreign counterparts

The weighted findings of our study are comparable to three nationwide studies of downshiffting: Schor's study (1998) in the USA, Hamilton and Mail's (2003) study in Australia and the Hamilton's (2003) study in the UK. If the *Genoeg* readers are considered members of a downshiffting community, the sample populations of at least three other studies are comparable to ours. These studies include Elgin and Mitchell's (1977) voluntary simplicity survey of the readers of the magazine *Co-Evolution Quarterly*, Pierce's (2000) study of voluntary simplifiers from a simplicity website and Huneke's (2005) voluntary simplicity study which drew its study participants from online forums related to voluntary simplicity. Comparison with these studies is further enabled by the fact that they essentially employed similar definitions of a voluntary simplifier.

Some noteworthy observations can be made. Contrary to the belief that downshiffting is predominantly an upper middle class phenomenon, findings suggest that voluntary downshiffting is not a lifestyle choice exclusive to the social elite, but might be an attractive way of life for people across all social strata.

Another similarity between our study and the results of other studies concerns the rather counterintuitive finding that only a quarter of voluntary downshiffters had experienced a decrease in income when they began downshiffting. Thus living with less money does not automatically result from a lower income, but appears to be a conscious choice. This conclusion counters the prevailing image of the postmodern consumer as a materialistic big spender, driven by hedonistic motives.

Consumption practices

To operationalize the Dutch Triple Gs of sustainable living: *geld* (money), *groen* (ecology) and *gezondheid* (health/wellbeing), we defined indicators for eco-friendly consumption and for the two other dimensions of sustainable living: namely money and health/wellbeing. Our measure combined items of the Ecological Footprint (Rees, 1998), and of the list of Simple Living Practices and the Simple Living Scale (Huneke, 2005) (see Tables 3 & 4) and addressed a broad range of activities across six domains: purchasing, food, leisure, environment, do-it-yourself, and mobility. High scores on the following items were considered indicative of eco-friendliness, conducive to proper personal finances and/or wellbeing: Purchasing: 1 - 6; Food: 7, 9, 10, 11; Leisure: 13, 15, 16, 18, 19, 22; Environment: 23 - 27; Do-it-Yourself: 28, 29, 30; Mobility: 32, 33, while low scores on the following items were considered indicative of eco-friendliness, conducive to proper personal finances and wellbeing/health: 8, 12, 17, 21, 31, and 34.

Table 3 reports the consumption practices of voluntary and involuntary downshiffters and Table 4 shows the consumption practices of downshiffters and non-downshiffters. Below, we first discuss the scores in each domain. Then we will summarise the main differences between consumptions practices of downshiffting and non-downshiffting practices.

The **purchasing practices** of non-downshiffters, and voluntary and involuntary downshiffters, appeared to be rather close. All reported regularly buying fair trade and green products,

although voluntary downshifters reported doing so significantly more often ($p < .01$) and they were also more likely to buy second hand goods. The second remarkable difference was noted for ignoring advertisements. In this respect, non-downshifters tended to ignore advertisements more frequently than (involuntary) downshifters ($p < .04$).

With regard to **food consumption**, the most salient result was the finding that all three groups reported very frequently cooking from scratch instead of eating prepared meals (Means > 4.35). Striking differences have been noted for non-downshifters eating organic food more frequently than downshifters ($p < .01$); downshifters on the other hand reported consuming more fish than non-downshifters ($p < .00$).

The three groups showed comparable scores (Means > 3.66) for reading, walking and biking and social contacts. The least frequently reported **leisure activities** were meditation and exercise/sports (Mean > 2.53). Further, participants reported engaging fairly often in activities related to personal growth and development. Watching television was also a popular leisure activity. Striking differences between the three groups were noted with respect to shopping, traveling and personal growth. Shopping occurred considerably more among involuntary downshifters than among voluntary downshifters ($p < .01$). Traveling occurred significantly more often among non-downshifters than downshifters ($p < .00$). Personal growth activities were practised more often by downshifters than by non-downshifters ($p < .00$).

In the **environment** category, we found that non-downshifters, as well as involuntary and voluntary downshifters, reported recycling glass and other materials very frequently (Means > 4.64). The three groups were also very resourceful with respect to energy consumption (Means > 4.2) and all reported a tendency to bring unnecessary items to second hand shops (Means > 4.12). The least frequently reported activity in this domain was organic composting (Means > 2.24). Compensating for CO₂ emissions due to air and car travel was also less frequently reported. Remarkably, we noted that downshifters were significantly more resourceful with energy than non-downshifters ($p < .01$).

In the **do-it-yourself** category, conducting one's own home maintenance appeared to be the most favourable activity for the three groups, with a striking difference in the scores of downshifters compared to non-downshifters ($p < .04$). Results for sewing clothes and growing vegetables indicated rather low frequencies.

Regarding **mobility**, biking was reported to be the most popular mode of transport for all types (Means > 3.93). Non-downshifters reported biking most often (Means > 4.18). Additionally, the three groups reported rarely traveling by air plane (Means > 1.92). Further, results indicated that downshifters were slightly more frequent car users (Means > 2.94) than non-downshifters (Means > 2.79), although the difference was not significant. With respect to public transport, conversely, non-downshifters showed higher means than downshifters (3.06 versus 2.93).

Table 3 Consumption Practices (Voluntary versus Involuntary Downshifters)*

	Voluntary downshifters n = 461			Involuntary n = 280			p-value
	Mean	SD	N	Mean	SD	N	
A Purchasing							
1 Buy fair trade	3.17	0.81	459	3	0.80	277	.01
2 Buy green	3.43	0.75	460	3.4	0.72	278	n.s.
3 Buy second hand	3.34	0.83	460	3.26	0.89	277	n.s.
4 Dumpster diving	2.12	1.04	460	2.03	0.99	278	n.s.
5 Buy at local stores	2.74	1.04	460	2.67	1.07	277	n.s.
6 Ignore advertisements	3.45	1.38	457	3.22	1.44	278	.04
B Food							
7 Eat organic food	3.17	1	460	3.07	1.03	278	n.s.
8 Eat meat	3.15	1.08	460	3.14	1.13	277	n.s.
9 Cook from scratch	4.35	0.64	460	4.38	0.65	277	n.s.
10 Eat local food	3.44	0.95	457	3.49	0.96	276	n.s.
11 Eat fish	3.18	0.92	460	3.19	0.92	278	n.s.
C Leisure							
12 Watch television	3.27	0.87	460	3.36	0.92	276	n.s.
13 Read	3.98	0.52	460	4.01	0.58	278	n.s.
14 Exercise/sport	2.81	1.08	459	2.73	1.06	277	n.s.
15 Walk and bike	3.76	0.84	460	3.83	0.81	277	n.s.
16 Meditate or pray	2.53	1.2	459	2.63	1.26	277	0.3
17 Shop	2.69	0.71	460	2.83	0.81	278	.01
18 Personal growth	3.41	0.89	456	3.52	0.89	275	n.s.
19 Social contact	3.68	0.64	460	3.68	0.73	278	n.s.
20 Go out	2.59	0.73	460	2.53	0.79	278	n.s.
21 Travel	2.75	0.78	459	2.64	0.83	278	n.s.
22 Garden	2.96	1.2	458	3.06	1.21	278	n.s.
D Environment							
23 Recycle	4.68	0.62	459	4.64	0.72	278	n.s.
24 Compost	2.42	1.68	459	2.24	1.60	277	n.s.
25 Limit energy consumption	4.33	0.68	459	4.34	0.66	277	n.s.
26 Bring items to second hand shop	4.12	1.1	459	4.2	1.02	278	n.s.
27 Compensate CO2 emissions	2.72	2.2	459	2.94	2.27	277	n.s.
E Do-it-yourself							
28 Sewing	1.95	1.09	461	1.98	1.17	280	n.s.
29 Grow vegetables	2.18	1.31	460	2.08	1.41	280	n.s.
30 Do home maintenance	3.56	1.09	461	3.42	1.13	279	n.s.
F Mobility							
31 Car use	2.93	1.14	460	2.96	1.21	279	n.s.
32 Public transport	2.91	1.07	461	2.95	1.07	279	n.s.
33 Biking	3.93	0.99	460	3.96	1.01	278	n.s.
34 Plane	1.85	0.83	461	1.85	0.79	280	n.s.

Note * Answers were provided on a 5-point scale. Scale means were subsequently calculated and compared. Multiple testing correction was applied using the Bonferroni correction.

Table 4 Consumption Practices (Non-Downshifters versus Downshifters)*

	Non-downshifters <i>n</i> = 265			Downshifters <i>n</i> = 741			p-value
	Mean	SD	N	Mean	SD	N	
A Purchasing							
1 Buy fair trade	3.21	0.78	264	3.1	0.81	736	n.s.
2 Buy green	3.47	0.77	264	3.42	0.74	738	n.s.
3 Buy second hand	3.22	0.86	264	3.31	0.85	737	n.s.
4 Dumpster dive	2.04	1.07	263	2.09	1.02	738	n.s.
5 Buy at local stores	2.77	0.98	264	2.71	1.05	737	n.s.
6 Ignore advertisements	3.57	1.38	264	3.36	1.41	735	.04
B Food							
7 Eat organic food	3.33	1.02	263	3.13	1.01	738	.01
8 Eat meat	3.1	1.14	264	3.15	1.09	737	n.s.
9 Cook from scratch	4.37	0.63	263	4.36	0.64	737	n.s.
10 Eat local food	3.32	0.94	263	3.46	0.96	733	n.s.
11 Eat fish	2.94	0.91	264	3.18	0.91	738	.00
C Leisure							
12 Watch television	3.27	0.79	264	3.3	0.89	736	n.s.
13 Read	3.94	0.62	265	3.99	0.55	738	n.s.
14 Exercise/sport	2.91	1.14	263	2.78	1.07	736	n.s.
15 Walk and bike	3.85	0.69	265	3.79	0.83	737	n.s.
16 Meditate or pray	2.55	1.23	264	2.57	1.22	736	n.s.
17 Shop	2.7	0.70	265	2.74	0.75	738	n.s.
18 Personal growth	3.23	0.99	261	3.45	0.89	731	.00
19 Social contact	3.66	0.65	264	3.68	0.67	738	n.s.
20 Go out	2.64	0.74	264	2.57	0.75	738	n.s.
21 Travel	2.88	0.78	263	2.71	0.8	737	.00
22 Garden	3.11	1.12	263	3	1.2	736	n.s.
D Environment							
23 Recycle	4.75	0.52	265	4.67	0.66	737	.05
24 Compost	2.54	1.67	265	2.35	1.65	736	n.s.
25 Limit energy consumption	4.2	0.72	265	4.34	0.67	736	.01
26 Bring items to second hand shop	4.14	1.01	265	4.15	1.07	737	n.s.
27 Compensate for CO2 emissions	2.92	2.24	264	2.8	2.23	736	n.s.
E Do-it yourself							
28 Sewing	1.87	1.04	265	1.96	1.12	741	n.s.
29 Grow vegetables	2.18	1.32	265	2.14	1.35	740	n.s.
30 Do home maintenance	3.35	1.02	265	3.51	1.10	740	.04
F Mobility							
31 Car use	2.79	1.15	264	2.94	1.16	739	n.s.
32 Public transport	3.06	1.08	265	2.93	1.07	740	n.s.
33 Biking	4.18	0.85	265	3.94	1	738	.00
34 Plane	1.92	0.76	265	1.85	0.81	741	n.s.

Note * Answers were provided on a 5-point scale. Scale means were subsequently calculated and compared. Multiple testing correction was applied using the Bonferroni correction.

Differences between downshifters and non-downshifters

Although generally downshifters and non-downshifters both scored fairly high on all practices indicative of eco-friendliness and simple living, downshifters appeared to practise more indicators. With respect to energy use and fish consumption we found remarkable differences between the scores of downshifters and non-downshifters, the more since the sample includes the readers of the magazine *Genoeg*. Further, downshifters practised activities related to personal growth and home maintenance more often than non-downshifters. On the other hand non-downshifters reported eating more organic food than downshifters. They also reported ignoring advertisements more often. Further, they were traveling more often, as the results showed that they bike more frequently than downshifters.

Positive and negative experiences with downshifting

Experiences of downshifting were considered meaningful indicators for the third pillar of the Dutch Triple Gs: health and wellbeing. Therefore we used two open-ended questions that invited participants to provide three positive and three negative experiences with spending reduction. Two evaluators categorised the results separately. In this way, nine categories of positive experiences and eight categories of negative experiences emerged. Then, two additional evaluators processed the responses separately and classified all but three responses identically (see Table 5). Again results are presented for voluntary and involuntary downshifters.

As Table 5 shows, there is some overlap in these categorizations, since three categories concern both positive and negative experiences. Six categories thus are specifically positive, while five categories are specifically negative. Below we will explain the meaning of all positive and negative experiences. Then we will compare voluntary and involuntary downshifters' scores and discuss their different experiences.

The following three types of experiences had double assessment. They are listed in the categorization of both positive and negative experiences.

The category **challenge** included the concept that the task of making ends meet is perceived as a sport or game. Downshifting thus is seen to have a competitive element in which downshifters attempt to adjust expenses and consumption patterns to the new financial standard. This experience was described by respondents as a "sport" or "game". The experience can be labelled as positive (a sport as in a special task assignment that has to be overcome and that provides a stimulating experience encouraging respondents to achieve). The challenge can also be viewed as a negative experience. In this case, the task of making ends meet is experienced as too onerous or too difficult or even impossible. Respondents mentioned, for example, that the involuntariness of spending reductions makes it difficult to adjust their expenses to the new consumption standard.

Budgeting denotes explicit financial planning. The term includes the inventory of financial means, the preparation of an overview and the calculation of a budget. Budgeting may be experienced as positive or negative, depending on the person's ability to succeed in this, for most respondents, new task.

The category **psychological effect** refers to the emotional and psychological consequences of living with less. It has two dimensions as respondents reported both positive and negative psychological experiences. The positive consequences included increased self-esteem, confidence, pride, independence and an increased sense of autonomy. Additional positive consequences were the strengthening of one's personality and increased self-knowledge. Negative psychological experiences reported included feelings of stress, worry and guilt, especially toward one's children. Feelings of being a personal failure or being deficient and feelings of low self-esteem were also reported.

Further we noted six more positive categories:

The category **financial effect** denotes the results and outcomes of living with less such as increased savings, debt reduction and the possibility of being able to afford special purchases or to support one's children's education.

Personal growth denotes the knowledge and skills gained during the process of living with less. Respondents mentioned that they became more creative because of downshifting and developed particular skills or gained particular knowledge.

The category **post-materialism** denotes the acquisition of a changed attitude toward money and material possessions. As a positive experience, it puts the importance of material possessions into perspective and respondents reported that they became less attached to material possessions while, at the same time, placing increased value on what they already owned.

Social effect refers to the strengthening of social ties such as family relationships and friendships. This category also includes reports of changes in social contacts because of living with less, such as meeting new soul mates and ending other relationships.

Quality of life represents having an increased appreciation of life and is analogous with reports of less fatigue, less stress, more free time and/or having a more adventurous life. It also includes reports of improved health and better physical condition resulting from less stress and/or better food.

Better citizen refers to all positive evaluations of living with less that impact the world. For example, respondents mentioned that spending their money more consciously had allowed them to contribute positively to the environment and/or made them more compassionate toward the underprivileged. This category is also connected to greater engagement with issues of poverty, pollution and global concerns, and includes a critical awareness of the social pressures of consumerism.

The following five negative categories were reported:

In the responses to the question on negative experiences, a substantial number concerned familial relationships within the immediate **family** such as with a partner, children and other close family members. Respondents mentioned discussing expenses with their relatives and being met with protest, critique and arguments. With regard to the nature and the intimate

character of the bonds, this specific type of social effect was identified as a separate category and distinguished from the category “social effect” in the list of positive experiences.

The category **poverty** includes all direct reports of poverty as well as more descriptive reports such as “too little money to cope”, and “unable to buy essentials”.

Sacrifice includes reports of material or immaterial items that are no longer affordable, as well as activities which are considered to be too costly and therefore forsaken.

The category **criticism/incomprehension** includes the comments and lack of understanding that respondents reported receiving from their social environment. The intensity of negative reactions varied from slightly negative surprise to severe forms of disapproval or ridicule.

Isolation includes the experience of becoming a social outsider as a result of the decision to downshift or the inability to invest in social obligations (e.g., gifts) and social activities such as parties, going out with friends or colleagues, and so on.

Table 5 Positive and Negative Experiences *

	Voluntary		Involuntary		p-value
	N	%	N	%	
Positive experiences					
Challenge/process	43	9	28	10	n.s.
Budgeting	73	16	41	15	n.s.
Financial effect	121	26	34	12	.00
Personal growth	63	14	33	12	n.s.
Psychological effect	135	29	63	23	.04
Post-materialism	169	37	119	43	n.s.
Social effect	42	9	21	8	n.s.
Quality of life	121	26	46	16	.00
Better citizen	97	21	27	10	.00
Not applicable/no positive	63	14	73	26	.00
Negative experiences					
Challenge/process	49	11	46	16	.02
Budgeting	32	7	30	11	n.s.
Psychological effect	53	12	44	16	n.s.
Family problems	29	6	19	7	n.s.
Poverty**	6	1	8	3	--
Sacrifice	60	13	54	19	.02
Incomprehension/critics	79	17	19	7	.00
Isolation **	9	2	13	5	--
Not applicable/no negative	242	53	130	46	n.s.

Note * The list of positive and negative experiences resulted from a categorization of the responses to two open-ended questions to which participants could provide a maximum of three answers. ** numbers were too small for testing

Findings

The experiences of voluntary and of involuntary downshifters show some noteworthy differences (see Table 5). The most apparent finding is that involuntary downshifters reported

higher scores for all negative experiences, except for the category **incomprehension/criticism**. Voluntary downshifters reported higher scores for all positive experiences. When we consider the nature of the experience—positive or negative—the following finding is of note: In the range of negative experiences, almost half of the involuntary downshifters (46%) and over half of the voluntary downshifters (53%) reported having no negative experiences or non response.

The negative experience that scored the highest among voluntary downshifters concerned the category **incomprehension/criticism** (17%). Participants reported that they were confronted with critique and negative judgment from their social environment. Involuntary downshifter scores were significantly higher in two categories: **sacrifice** (19%) and **challenge** (16%). Also the category **psychological effect** (16%) showed higher scores, although not significantly. Respondents reported that trying to cope with less money was a difficult task.

With regard to positive experiences, the highest scores among both the voluntary and involuntary downshifters were reported in the categories **post-materialism** and **psychological effect**. About 40% of involuntary (43%) and voluntary downshifters (37%) reported that they valued material possessions and money differently from before. Also, a positive psychological and emotional effect was reported by 29% of voluntary and 23% of involuntary downshifters. This was described as feeling independent and autonomous and feeling good about the fact that they now could master their finances.

Increased quality of life (26% of voluntary downshifters) was also reported to be connected with pleasure derived from engaging in new activities as a result of living with less money. Respondents described their new lifestyle as more creative and adventurous. They reported doing nicer things such as going on sporting holidays, going for nature walks and picking fruit and mushrooms. In addition, the discovery of unexpected talents (e.g., gardening, cooking, do-it-yourself projects) contributed to the quality of life experience. Also, one fifth of the voluntary downshifters reported a change in attitude and a new commitment to society and the world, which we labelled as being a better citizen. Lastly, respondents reported that they had become more generous and more committed to the environment and/or the eradication of world poverty.

Rounding up, we may conclude that involuntary downshifters reported more negative experiences than voluntary downshifters, except for the category **postmaterialism** which was selected more often by involuntary downshifters. In general, it was shown that voluntary downshifters reported more positive experiences. An exception to this finding was that they selected the negative experience **incomprehension/critics** more frequently than involuntary downshifters. These results seem to suggest that voluntary downshifters experience more negative social reactions and more positive individual effects.

Attitudes: frugality and autonomy

To measure the attitudes that direct frugal behaviour, we chose the Frugality Scale (Lastovicka, Bettencourt, Hughner, & Kuntze, 1999), because the 8 propositions in this scale mainly refer to practices in line with our research focus on concrete consumer behaviour. We added though two extra propositions (numbers 9 and 10). Theories of postmaterialism

(Bauman, 2007; Schor, 1991, 1998; Inglehart, 1977, 1997) and characteristics of new consumer groups (Etzioni, 1998; Ray & Anderson, 2000; De Geus, 2003) inspired us to hypothesise about the downshifters' aspirations of autonomy and self-determination. These expectations were substantiated by results of our former field study (Schreurs, 2010) showing a number of negative reactions and critiques from the social environment. We hypothesised that downshifters are less receptive to commercial influences than non-downshifters. We further assumed that downshifters have stronger feelings of autonomy and self-determination, and a greater tendency to organise their life according to their own system of standards and values than non-downshifters.

The Frugality Scale results (see Tables 6 & 7) show that, in general, all participants reported being fairly frugal. However, some significant differences were found between downshifters and non-downshifters. Generally, the non-downshifters appeared to be less frugal than the downshifters, since downshifters appeared to agree significantly more often than non-downshifters with 5 out of 8 propositions of the Frugality Scale. Comparisons between the scores of voluntary and involuntary downshifters (see Table 6) showed only one significant difference, namely for the proposition about the disciplined handling of one's money.

The expectation that downshifters are less susceptible to interpersonal or commercial influence than non-downshifters was not affirmed. However, the results for proposition 10 showed that downshifters actually affirmed the proposition significantly more often ($P = .00$) than non-downshifters, meaning that downshifters have a greater tendency to organise their life according to their own system of standards and values than non-downshifters.

Table 6 Frugality Scale: Voluntary and Involuntary Downshifters

	Voluntary $n = 461$			Involuntary $n = 280$			p-value
	Mean	SD	N	Mean	SD	N	
1. If you take good care of your possessions, you will definitely save money in the long run.	4.57	0.53	458	4.53	0.56	278	n.s.
2. There are many things that are normally thrown away that are still quite useful.	4.65	0.50	459	4.66	0.55	278	n.s.
3. Making better use of my resources makes me feel good.	4.42	0.65	457	4.5	0.6	277	n.s.
4. If you can re-use an item you already have, there's no sense in buying something new.	4.42	0.66	459	4.38	0.65	278	n.s.
5. I believe in being careful in how I spend my money.	4.34	0.63	458	4.34	0.68	277	n.s.
6. I discipline myself to get the most from my money.	3.75	0.89	456	3.97	0.84	277	.00
7. I am willing to wait on a purchase I want so that I can save some money.	4.07	0.76	457	4.1	0.76	276	n.s.
8. There are things I resist buying today so I can save for tomorrow.	3.72	0.91	451	3.72	0.93	266	n.s.
Frugality scale	4.25	0.43	463	4.25	4.21	239	n.s.
9. Compared with others in my environment, I am disciplined with money and make less impulse purchases.	4.06	0.83	457	4.02	0.88	273	n.s.
10. I try to live as my own life as much as possible and ignore other peoples' views.	4.2	0.78	457	4.3	0.72	278	n.s.

Table 7 Frugality Scale: Non-Downshifters and Downshifters

	Non-downshifters <i>n</i> = 265			Downshifters <i>n</i> = 741			p-value
	Mean	SD	N	Mean	SD	N	
1. If you take good care of your possessions, you will definitively save money in the long run.	4.44	0.56	264	4.55	0.54	736	.01
2. There are many things that are normally thrown away that are still quite useful.	4.63	0.52	264	4.65	0.52	737	n.s
3. Making better use of my resources makes me feel good.	4.41	0.66	263	4.45	0.63	734	n.s
4. If you can re-use an item you already have, there's no sense in buying something new.	4.34	0.67	264	4.41	0.66	737	n.s
5. I believe in being careful in how I spend my money.	4.22	0.66	262	4.34	0.65	735	.01
6. I discipline myself to get the most from my money.	3.62	0.88	260	3.83	0.88	733	.00
7. I am willing to wait on a purchase I want so that I can save some money.	3.92	0.79	262	4.08	0.76	733	.01
8. There are things I resist buying today so I can save for tomorrow	3.53	1.01	254	3.72	0.91	717	.01
Frugality scale	4.15	0.43	263	4.25	0.43	703	.00
9. Compared with others in my environment, I am disciplined with money and make less impulse purchases.	3.94	0.85	263	4.05	0.85	730	n.s
10. I try to live as my own life as much as possible and ignore other peoples' views.	4.03	0.79	261	4.24	0.76	735	.00

Discussion and conclusions

What new insights for sustainable living may be concluded from the results of this study? In this final section we will return to the main theme of this paper: What opportunities does downshifting offer to sustainability? As already mentioned in the introduction, we use a broader definition of sustainable living than just eco-friendliness. In our view also proper financial behaviour and health and wellbeing are part of it, as depicted in our model of the Dutch Triple Gs of a sustainable lifestyle: *geld* (money), *groen* (eco-friendliness) and *gezondheid/welzijn* (health-wellbeing). Using this conceptual framework we will now discuss results pertaining to (a) Financial behaviour, (b) Eco-friendly behaviour, and (c) Personal wellbeing.

Financial behaviour

Downshifters tend to be conscious, careful spenders as revealed by their scores on the Frugality Scale and by their responses to the list of consumption expenditures. Their product use and their buying behaviour are frugal and restrained, and budgeting is generally perceived as one of many positive experiences associated with downshifting. Downshifters

seek to increase their savings and pay off their debts. This may be interpreted as an indication of sound financial management. Studies in other countries show that the wise stewardship of resources is a common trait among downshifters (Schor, 1998; Breakspear & Hamilton, 2004; Huneke, 2005). However, this is not the explicit goal but rather a means—a deliberately chosen strategy to serve other goals. Similarly, we found that downshifters seek to maintain their lifestyle by ignoring advertisements and strengthening their own convictions. This attitude may function as a protective measure to counter marketing stimuli for impulse buying. Moreover, it may protect downshifters from the criticism that voluntary downshifters in particular receive from their social environment.

Eco-friendly behaviour

Our study showed various indications of eco-friendly behaviour among downshifters. First, downshifters reported handling their possessions consciously and carefully. Overall, they recycle glass and other materials, take good care of their possessions, avoid waste and resourcefully use their possessions. Additionally, downshifters used significantly less energy than the non-downshifters in our study. This is an interesting finding as *Genoeg* readers are likely to be already more committed to reducing energy consumption than the general population in the Netherlands. As such, downshifters consistently met the standards for eco-friendly behaviour that seeks to reduce, re-use and recycle. When it comes to eco-friendly food consumption and mobility, the picture is less evident. Although downshifters consume local food products and fish more frequently, they consume significantly less organic food than non-downshifters. Additionally, downshifters did use the car slightly more and the bike significantly less than non-downshifters. These mixed results correspond with the results of previous studies that have linked downshifting to eco-friendliness (Breakspear & Hamilton, 2004; Jackson, 2009; Huneke, 2005).

Personal wellbeing and happiness

Unlike other studies on the subject of downshifting, our study did not specifically explore the emotions or judgments downshifters express about their way of life. However, given our results, we can conclude that downshifting may increase quality of life and therefore contribute to feelings of personal wellbeing and happiness. This is plausible, especially given the fact that downshifters reported a broad range of positive experiences. This is particularly the case for voluntary downshifters, although involuntary downshifters as well reported positive experiences such as stress reduction and improved psychological outlook. We can also assume that the reported increase in activities in the sphere of personal growth promotes personal wellbeing and contributes to a better quality of life. Yet, the results of previous studies found a more direct association between downshifting and increased quality of life and satisfaction with the lifestyle change (Breakspear & Hamilton, 2004). As Breakspear and Hamilton reported, “None had any regrets, except perhaps for the years lost before they made the change.” (p.ix). Conversely, our detailed overview of negative experiences paints a more nuanced picture of wellbeing and happiness. In particular, criticism from one’s social environment as well as the financial difficulties connected to trying to make ends meet seem to colour the downshifting experience.

In short, it can be concluded that downshifting can contribute to sustainability as this way of life fundamentally resonates with the three pillars of the Dutch triple Gs of a sustainable lifestyle. Downshifters tend to practise the re-use, reduce and recycle mantra of eco-friendly behaviour and they are careful, resourceful spenders who find other values more important than those provided by materialism and consumerism. It seems these positive experiences can also strengthen their attitude.

Although the motivation for downshifting appears to be rather personally than environmentally driven, the outcome of downshifting could be eco-friendly. It was found that interest for the environment could very well coincide with financial or personal interests. The finding that downshifters primarily seek an improvement of quality of life beyond materialism and consumerism could be very well addressed to promote sustainability. It can inspire to define new - less material - dimensions of sustainability and strengthen as well social and economic conditions of a sustainable lifestyle, besides the current focus on environment.

In sum, we contend that living with less can promote sustainability either directly through reduced consumption or indirectly through a more fundamental transformation of lifestyle. The following general prospects for sustainability have been identified:

1. In our time, frugality still is a vital cultural feature and a guiding principle for consumer behaviour and practices. This finding resonates with the reported cultural change towards a less materialistic way of life and indicates the possibility of broader support for reduction than is generally assumed.
2. Living with less may indeed contribute to a better quality of life. Positive experiences with downshifting contradict the popular belief that spending less or a decrease in income is a purely negative event.
3. The Dutch triple Gs of a sustainable lifestyle can supply the parameters for measuring the sustainability of downshifting.
4. Downshifting can be an instrument for sustainable development.

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Microfibre cleaning cloths: A review

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Abstract

Cleaning is an important task in households and cleaning cloths are among the most important tools in manual cleaning work. In this literature review an overview is presented of the benefits and drawbacks of microfibre cleaning cloths. The review shows that there is not a unanimous truth about the superiority of microfibre cloths: In six studies cited the effectiveness of microfibre cloths in removing microbial soil from surfaces was shown to be better than that of conventional cotton or non-woven cloths, whereas the performance of microfibre cloths was at least partly unsatisfactory in three studies. In general there is a potential to reduce water and disinfectant use with microfibrines, but not all microfibre fabrics, particularly when dry, are equally efficient and the type of soil also affects the cleaning efficiency. Some studies showed that there is a benefit in using detergents with microfibre cloths, while even clean microfibre cloths have been shown to cause microscopic changes in surfaces. Storage of dirty cloths is likely to lead to microbial growth and attachment in the cleaning cloths. In future studies concerning microfibre cleaning cloths it is important to characterize the microfibre cloths in detail.

Keywords: household, cleaning cloth, microfibre, hygiene, cleaning efficiency

Introduction

Cleaning affects human wellbeing in homes and at workplaces, for example in the form of health and aesthetic comfort. When done well, cleaning can improve both safety and health, and can also reduce costs, for example, by extending the life of the workplace (European Commission, 2009) and household equipment and maintaining surfaces in good condition. Cleaning cloths are used alone or with cleaning utensils such as mops. They are thus among the most important utensils in manual cleaning work.

The functions of cleaning cloths are to transport detergents and water, as well as to remove and carry soil and transport it away from surfaces. A useful general systematic approach to cleaning processes is the so called “Sinner circle”, according to which the cleaning process can be divided into four different key factors, namely chemistry, mechanical action, thermal effects and time (Rybinski, 2007). Referring to the Sinner circle factors, the main function of the cleaning cloth is to forward mechanical action in cleaning during a certain time but also to assist the chemical and thermal effects along with water and possibly detergent. This process should not cause deterioration of surfaces.

An important step in the development of cleaning equipment has been adapting microfibres to cleaning cloths. Microfibres are widely used in cleaning cloths both in households and in professional cleaning, for example, in private homes (Reisbacka *et al.*, 2008) and in healthcare facilities (Rutala, Gergen, & Weber, 2007). Several experimental studies have been carried out with the aim of examining microfibre cleaning cloths from different points of view. The aim of this literature study is to review research papers and other relevant information concerning microfibre cleaning cloths and to present an overview of their benefits, drawbacks and future challenges, particularly in the context of households.

Definition and morphology of microfibre cloths

The term “microfibre” commonly refers to any thin fibre with a ratio of weight (mass) to length of less than one decitex (1 decitex = 1 g / 10 000 m). Other related terms are also used (Miraftab, 2000). The fineness of so called ultra-microfibres is below 1/3 decitex. Ultra-microfibres are nowadays common in the cleaning industry and are claimed to have better cleaning properties than those of ordinary microfibres (Wirsching, Bangha, & Peikert, 2003; Wren *et al.*, 2008).

Microfibres are produced mainly from polyester and polyamide fibres using different techniques, leading to different properties of microfibres. Split technique makes the fibre surface sharp-edged, which results in an abrading effect of cleaning cloths (Miraftab *et al.*, 2000). In the case of conventional direct spinning, single-component filaments are extruded through spinnerets to give highly uniform microfibres (Kwon, Koh, Oh, & Kim, 2006). As in the case of textiles in general, microfibre textiles are also divided into woven, knitted and non-woven products on the basis of their structure (Wirsching *et al.*, 2003).

Qualitative SEM (scanning electron microscope) photomicrographs of four different microfibre cleaning cloths are presented as examples in Figure 1. Two of the cloths had split, multilayer fibres, whereas the two others were angular.

Cleaning efficiency when using microfibre cloths

Cleaning normally requires the input of energy in some form, and microfibre cloths are a means for assisting the physical removal of soil. The small diameter of the fibres leads to improved removal of soil when the fibres penetrate between the surface and soil. Microfibres have sharp edges that act mechanically on the surface, peeling off deposits and thus improving cleaning efficacy (Moore & Griffith, 2006; Nilsen, Dahl, Jørgensen, & Schneider, 2002). According to Wren *et al.* (2008), ultra-microfibre cloths might also be more suitable than conventional wet loop mop fibres for surfaces containing small abrasions invisible to the naked eye, in which bacteria might lodge.

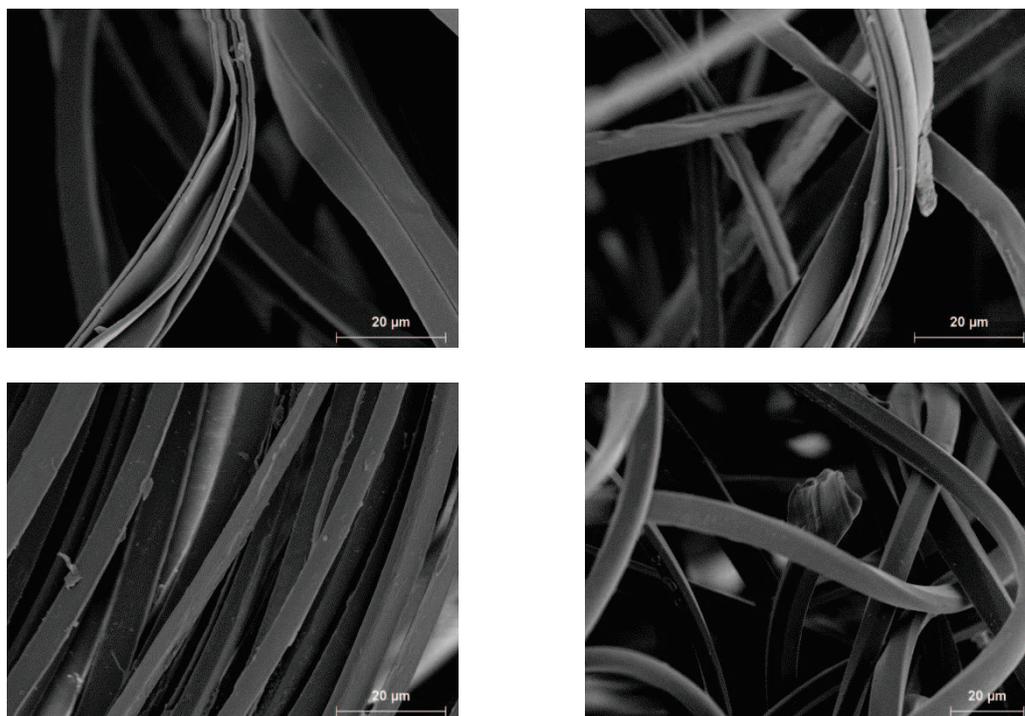


Figure 1 SEM pictures of four different microfibre cleaning cloths (magnification 1500x), showing split multilayer fibres in the two upper pictures and angular fibres in the two lower pictures

According to Wren *et al.* (2008) the positively charged fibres remove particles by a combination of static attraction and capillary action. According to Sattar (2008), microfibres are positively charged in order to better pick up dust, and dry mopping is in fact most suitable for this purpose. However, one benefit of microfibre products is their good water absorption (Wirsching *et al.*, 2003): microfibres can hold six times their weight in water (Sattar, 2008). Microfibres also efficiently remove oily soil (Wirsching *et al.*, 2003). According to Wirsching *et al.* (2003), water absorption of woven and knitted microfibre products is poorer than that of non-woven products. The superiority of the non-woven cloths is due to the uneven organization of the fibres.

An overview of studies examining microfibre cloths in the removal of different soils in households and general interiors is presented in Table 1. In several studies the effectiveness of the microfibre cloths in removing microbial soil from surfaces has been shown to be better than that of conventional cotton cloths or conventional non-woven cloths (Tekomo Byggnadskvalitet Ab, 1998 & Toiviainen-Laine, Kuisma, Kymäläinen, & Sjöberg, 2009, included in Table 1), and also in some studies in healthcare (Grieme, Thomson, & Carbone, 2009; Kymäläinen *et al.*, 2008; Rutala *et al.*, 2007; Wren *et al.*, 2008). By contrast, the performance of microfibre cloths was at least partly unsatisfactory in the study by Kusumaningrum *et al.* (2003), and in the studies in healthcare by Moore and Griffith (2006) and Diab-Elschahawi *et al.* (2010).

Table 1 Studies Examining the Use of Microfibre Cloths in the Removal of Different Soils in Households and General Interiors

Context (type of study)	Surface material in cleaning experiments	Soil (contaminant)	Cleaning method	Reference
General interior (L)	Plastic flooring	Dust containing indicator microbes	A mop simulator	Nyman (1996)
Office (F)	A worn, waxed plastic office floor subjected to natural soiling	Microbes	Manual mopping	Tekomo Byggnadskvalitet Ab (1998)
General interior (L)	Plastic laminate, stainless steel	A mixture containing e.g. soot, oil and solvent	A laboratory cleaning apparatus	Partanen (1998)
General interior (L)	Ceramic tile	Fatty soil with carbon black tracer	A washability tester and flat-bed-scanning	Martens (2001)
General interior (F)	Lacquered wooden shelves	Dust	Manual	Nilsen <i>et al.</i> (2002)
Households (L)	Stainless steel	Microbes	Manual	Kusumaningrum <i>et al.</i> (2003)
General interior (L)		Soot-oil mixture (oil-pigment), blood (protein)	A laboratory washability and scrub tester	Pesonen-Leinonen <i>et al.</i> (2003)
Professional private home cleaning (L)	Polyurethane-covered plastic flooring, steel, plastic high-pressure laminate	Organic bovine serum albumin, microbes	A laboratory tester	Toiviainen-Laine <i>et al.</i> (2009)

Note: L = laboratory, F = field.

Differences between microfibre cloth types have been observed in several studies in healthcare (Bergen, Meyer, Høg, Rubenhagen, & Andersen, 2009; Kymäläinen *et al.*, 2008; Moore & Griffith, 2006; Wren *et al.*, 2008) and in a previously unpublished experiment by Määttä, who used a radiochemical laboratory method for examining the efficiency of different microfibre cloths in the removal of inorganic and organic particle soils. In her study differences between the abilities of the cloths to remove organic particle soil were minor, whereas there were greater differences in the abilities of the cloths to remove inorganic particle soil. Wren *et al.* (2008) suggested that it is possible that the divergent results in their study in healthcare can be explained by the very different structure and size of the fibres in the individual cloths used in different studies. Moore and Griffith (2006) suggested in their study in healthcare that the lower polyester content and smooth surface of some microfibre cloths may have explained their poorer cleaning efficiency compared to that of other cloths. Wear of the cloths and fibres also affects the cleaning results. In a study by Partanen (1998), great variation was observed in the cleaning efficiency of different microfibre cloths, particularly in the case of new cloths, when using soot-oil soil and evaluating the cleaning result colorimetrically; after 50 washings the differences were smaller.

Discussion

Effect of water on the cleaning result in microfibre cleaning

The advantage of microfibre cloths is that they can be used as dry, moistened or wet. The experiments presented by Nyman (1996) showed that a certain amount of moistening (water) was needed to obtain significant decrease of bacterial and dust levels on surfaces. This result is also supported by some other studies. In the study in healthcare by Kymäläinen *et al.* (2008), both microfibre and conventional cloths were more effective in the removal of microbial soil when well moistened than when only slightly moistened. Similarly, the results of a study in healthcare by Diab-Elschahawi *et al.* (2010) showed that the uptake of microorganisms was much lower using a dry cloth than a moist cloth, regardless of the type of cloth. According to Moore and Griffith (2006), microfibre cloths should be used damp for optimal cleaning of surfaces. However, according to their study in healthcare, the cleaning efficiencies of different microfibre cloths varied.

On the other hand, in the study by Nilsen *et al.* (2002), both dry and damp microfibres and other cloths were able to remove over 90% of the dust deposit from a highly contaminated surface, and there was no difference in the cleaning effect in dry and in damp conditions. In a study by Moore and Griffith (2006), comparison of microfibres with other types of cloths in healthcare gave a different result depending on whether the cloths were examined dry or wet. When used dry on a dry surface, none of the cloths were significantly better than the others, and none of the cloths removed the microbial or organic bioburden effectively. When used wet on a dry surface, the cleaning efficiencies of six different microfibre cloths varied, and in most cases were not significantly better than paper towels or conventional cloths. One type of microfibre cloth did perform significantly better than the others and better than paper towels in reducing both organic soil and microbial load. According to Hanski and Korhonen (2009), experience will best help to moisten the fibres to a reasonable extent. Sattar (2008) reported that microfibres are less efficient when fully saturated because of the need for capillary action. Nilsen *et al.* (2002) argued that dampness increases friction, with a potential increase in the workload of the cleaners.

Effects of detergents and biocides on the cleaning result in microfibre cleaning

A broad spectrum of cleaning agents is widely used to facilitate dust and soil removal, for disinfection and surface maintenance. Wren *et al.* (2008) reported on the other hand that the ultra-microfibre cloths particularly are designed to be used with low volumes of water containing neither detergents nor biocidal additives. According to several studies, the cloths made from microfibre and ultra-microfibre had a good cleaning effect even without the use of cleaning chemicals (Nilsen *et al.*, 2002; Pesonen-Leinonen *et al.*, 2003; Toiviainen-Laine *et al.*, 2009) and similarly in the healthcare sector (Rutala *et al.*, 2007). In all these studies the micro- and ultra-microfibre cloths showed the same cleaning effect without any use of detergent as that of the ordinary cloth with detergent. However, in a study in healthcare by Kymäläinen *et al.* (2008), the use of microfibres and conventional cloths with detergent resulted only in a partly better cleaning effect than that achieved with only water. In a study in healthcare by Hamilton *et al.* (2010), cleaning of surfaces with ultra-microfibre cloths moistened with water resulted in a 30% decrease in total viable bacterial counts. Wren *et al.*

(2008) reported that there is a potential to reduce water and disinfectant use in healthcare, but that not all microfibre fabrics have an equal effect. It should also be remembered that the type of soil also affects the need for the use of detergents.

Research results concerning cleaning efficiency of microfibre cloths

Why are the results concerning the cleanability efficiency of microfibre cloths not unanimous? Detailed attempts to explain the differences on the basis of the different properties of the cloths are often not possible because necessary information is not reported. In a study by Nilsen *et al.* (2002) the composition, type and shape and thickness of the fibres, as well as the texture and square mass of the cloth, varied more widely than in the other published studies reviewed in Table 1. Some parameters were reported in the other studies, such as fibre composition (Nyman, 1996; Bergen *et al.*, 2009; and to some extent Wren *et al.*, 2008; Kymäläinen *et al.*, 2008; Toiviainen-Laine *et al.*, 2009), structure or texture (Toiviainen-Laine *et al.*, 2009; Toiviainen-Laine, Kymäläinen, & Kuisma, 2010; and to some extent Kymäläinen *et al.*, 2008), density or square mass (Toiviainen-Laine *et al.*, 2009) and total mass of the cloth (Moore & Griffith, 2006; Rutala *et al.*, 2007; Tekomo Byggnadskvalitet Ab, 1998). The composition and amount of finish in the cloth can also be very important for the performance of the cloth, but this information is often difficult to obtain. In most if not all studies commercial cloths were examined, which may partly explain the lack of information. It is also probable that detailed characterization of the cloths was not considered essential in relation to the aims in many of the studies. On the other hand Moore and Griffith (2006) stated in the conclusions of their study that since different microfibre cloths have different characteristics, the name “microfibre” should not imply superior cleaning efficacy. In some studies (e.g. Bergen *et al.*, 2009; Hamilton *et al.*, 2010; Wren *et al.*, 2008), only one microfibre cloth type was examined, which leads to the problem of fully generalising the results to different microfibre cloths. However, the specific aims of the studies may have been reached with the experimental methodology selected, as in the three studies mentioned.

In addition to the cloth properties, soils or contaminants, cleaning method, as well as detection methods, also affect the results of the experiments. As in the studies reported in Table 1, variation in the experimental procedures in the different studies was considerable. When considering the results of the previous studies as a whole, it is evident that more studies examining in more detail the relationships between the characteristics or features of different microfibre cloths with relation to their performance, for example cleaning efficiency, should be carried out. Furthermore, there is naturally variation in cleaning procedures in real life, but the variation in experimental procedures has almost certainly affected the results. Park, Kim, Kim, Jeong, and Jaung (2001) showed that by adjusting the manufacturing technique, properties such as moisture absorption of the fibres can be optimally regulated.

Side effects: safety of environmental surfaces in buildings

The main function of cleaning cloths is naturally the removal of soil and thus maintaining the value of the surface. However, in addition to cleaning, the cloths may also have negative side effects on the surfaces. Kildesø and Schneider (2001) stressed that care should be taken not to scratch softer surface materials such as vinyl and painted surface materials. According to

the study by Nilsen *et al.* (2002), the cloths should be used damp in order to minimise surface abrasion. In their study all the prewashed, clean conventional (1 cloth), microfibre (12) and ultra-microfibre cloths (2) tested without soil acted abrasively on Plexiglas, causing two kinds of damage to the surface as observed by SEM (scanning electron microscopy): micro-roughness and scratch marks. The degree of micro-roughness was in general smaller with dry cloths than when the cloths were used in damp condition. Gloss reduction was observed mainly when the cloths were used dry. An opposite result was obtained in the study by Roiko-Jokela *et al.* (2003), who examined the abrasion of seven different microfibre cloths as dry and wet, and as 50 times washed or as new. In their study a clean microfibre cloth did not scratch glass, plexi plastic, stainless steel, plastic laminate or varnished wood surfaces. After 1000 movements in a cleaning simulator the gloss of surfaces was not changed, and visual observation used by Roiko-Jokela *et al.* (2003) showed no damage to the surfaces. When these results are compared with the different results of Nilsen *et al.* (2002), one explanation, in addition to the different rubbing method, is that probably the gloss measurements and visual observation did not show the effects that could have been observed by SEM as used in the study by Nilsen *et al.* (2002).

An important observation from the study by Roiko-Jokela *et al.* (2003) is that if there was hard, sharp-edged particle soil (sebum-aluminium oxide) in the cloth, visible scratches and other forms of damages were formed on the surfaces. Thus it was concluded in their study that it is important to clean the cloths properly after use. Some manufacturers of the cloths specify that zeolite should be avoided, since the residuals in microfibre cloths may cause scratches on surfaces during wiping.

Hygiene, storage and washing of dirty microfibre cleaning cloths

A good cleaning result is obtained only by using clean cleaning cloths. Kusumaningrum *et al.* (2003) detected a significant amount of microbes in the cloths after cleaning surfaces contaminated with microbes. It has been shown in some studies that dirty cleaning cloths can spread microbes to surfaces or to hands via surfaces (Aiello, Larson, & Sedlak, 2008; Bergen *et al.*, 2009; Hilton & Austin, 2000; Kagan, Aiello, & Larson, 2002). According to a study by Bergen *et al.* (2009), when using folded moistened cloth this may be because a side of the cloth not yet used becomes contaminated during the cleaning process, or bacteria pass through the cloth or during folding, transferring via contact to sides not used. However, in the study by Moore and Griffith (2006), some of the microfibre cloths transferred significantly less organic debris and micro-organisms back to the surface than other cloths. In accordance with this but using different experimental methodology, Grieme *et al.* (2009) showed that microfibres were superior to cotton terry cloth in preventing transfer of micro-organisms to clean surfaces. On the other hand, the microfibre cloths can be washed and reused even 500 times or more, which emphasises the importance of the hygienic result of laundering (Moore & Griffith, 2006; Wren *et al.*, 2008). Furthermore, the study by Sattar (2008), although examining other than cleaning cloths, showed that moisture enhanced transfer of bacteria from cloths to surfaces. Since storage of dirty cloths leads easily to microbial growth and attachment in the cleaning cloths (Cogan, Slader, Bloomfield, & Humphrey, 2002; Toiviainen-Laine *et al.*, 2010), cleaning cloths should be washed as soon as possible after use and not stored damp overnight (Toiviainen-Laine *et al.*, 2010). In some cases, for example when washing of the cloths causes problems, a disposable cloth may be a favourable option. It is

important to use cloths which are as clean as possible and to use the clean side of folded cloths (Bergen *et al.*, 2009). As when using conventional cleaning cloths, colour coding of microfibre cleaning cloths could also help to prevent cross-contamination.

Sattar (2008), as well as some companies selling microfibre cloths, recommend washing these products in regular washing detergent with no fabric softeners or quats (quaternary ammonium cations), bleach or oily or soap-based detergents. Some companies recommend the use of pre-rinsing and prewashing to remove loose soil from the cloth that could cause wearing of the cloths during the main laundering. The International Scientific Forum on Home Hygiene (IFH) (2004) considered that for cleaning utensils, detergent base cleaning is insufficient to eliminate the microbial risk, particularly when cloths have become heavily contaminated. In the study by Toiviainen-Laine *et al.* (2010), after the contaminated microfibre cloths were washed at 60°C the numbers of bacteria clearly decreased, although small or even moderate numbers of microbes were still detected after washing. According to several studies (e.g., Fijan, Koren, Cencic, & Soster-Turk, 2007; Gerba & Kennedy, 2007; Larson & Duarte, 2001) the effect of higher washing temperatures, the mechanical action of the laundering machine or the use of disinfectants or drying reduce contamination in the laundry. IFH (2004) considers three alternative procedures suitable for achieving hygiene of cloths and other cleaning utensils in households: rinsing with detergent and hot water followed by immersion in water held at 90°C or more for 2 minutes, a laundering or dishwashing cycle at a minimum temperature of 60°C, or application of a disinfectant. Cleaning cloths should be selected to allow washing at hot temperatures (Toiviainen-Laine *et al.*, 2010). According to Wirsching *et al.* (2003) and Sattar (2008), one benefit of microfibre products is their rapid drying, improving their hygienic properties. Polyester, which generally constitutes most of the microfibres, is rather hydrophobic and will not absorb much water on its surface. Rapid drying decreases the cross-contamination risk (Kusumaningrum *et al.*, 2003). Microfibres can also easily be wrung dry (Sattar, 2008).

In the studies by Larson and Duarte (2001) and Gerba and Kennedy (2007) it was demonstrated that microbes may transfer between contaminated and uncontaminated items of clothing during laundering. According to IFH (2004) and Bloomfield, Aiello, Cookson, O'Boyle, and Larson (2007), laundry can act as a disseminator of infection firstly when it is handled before laundering and secondly if the laundry process fails to fully remove microbial contamination and if the laundry remains damp for a longer period before being handled. However, according to IFH (2004), drying of laundry in most cases further reduces contamination to a level where it no longer represents a significant risk.

Some microfibre cloths with an antibacterial property are already available on the market. In some cloths the antibacterial silver-based agent is embedded in the microfibres. Published results of their efficiency were not available, although some companies report that they have tested and demonstrated the performance of the cloths. Kusumaningrum *et al.* (2003) compared the removal of some microbes with antibacterially-treated (anionic surfactants or unspecified antimicrobial agent) sponges and napkin cloths, as well as non-antibacterially treated sponges and viscose cloths and a microfibre cloth. After cleaning of contaminated surfaces, the disposable antibacterial (non-microfibre) cloths were the only ones on which no

microbes were detected. Park *et al.* (2001) showed that a chemical antimicrobial finishing treatment only slightly decreased the absorbance of a microfibre cloth.

Wearing resistance, costs and environmental aspects

Microfibre cloths can be washed and reused up to 300 times (Rutala *et al.*, 2007) or even 500 times (Diab-Elschahawi *et al.*, 2010). They may thus be more economical than cheaper cloths with a shorter life span. However, Diab-Elschahawi *et al.* (2010) observed that the decontamination effect of the microfibre cloths decreased after 20 launderings at 95°C. On the other hand, in a laboratory study by Nyman (1997), the size and mass of the used microfibre cloths were lower than those of unused cloths, although the cleaning abilities of the new and used microfibre cloths were similar when wet and almost similar when dry (plastic laminate surfaces, standard dust soil as emulsion with bacterial addition, dry and moist cleaning methods). In the study by Nilsen *et al.* (2002) all the conventional, microfibre and ultra-microfibre cloths tested were observed to be wear resistant.

One point of view for the wearing resistance is that polyester fibres provide strength for the cleaning cloths, but (particularly relevantly in the case of disposable wipes) take a considerable time to degrade in waste disposal sites, thus causing environmental loading (Soukupova, Boguslavsky, & Anandjiwala, 2007). Another point of view regarding ecological aspects is that the use of microfibre cloths may decrease the need to use detergents, bringing potential environmental and economic benefits. Minimised use of detergents may also be beneficial for human health, since increased risk of asthma, chronic bronchitis and other respiratory symptoms among employees in domestic cleaning and among people performing cleaning tasks in their own home has been observed in several studies (Kogevinas *et al.*, 1999; Medina-Ramón, Zock, Kogevinas, Sunyer, & Antó, 2003; Rosenman *et al.*, 2003; Wolkoff *et al.*, 1998; Zock *et al.*, 2007). According to Nilsen *et al.* (2002), the result of substitution of conventional cloths with ultra- or microfibre cloths will be reduced exposure of cleaning personnel to cleaning agents, reduced discharge of cleaning agents into the indoor and outdoor environment, reduced consumption of water and energy, and reduced consumption of cloths.

Conclusions

Microfibre cleaning cloths are widely used both in private homes and in professional cleaning. Microfibre cloths are a means for assisting the physical removal of soil. The small diameter of the fibres leads to improved removal of soil when fibres penetrate between the surface and soil. When using dry cloths the positively charged fibres remove particles particularly by static attraction. Many microfibre products have good water absorption. In several studies the effectiveness of the microfibre cloths in removing microbial or other types of soils from surfaces has been shown to be better than that of conventional cotton cloths or conventional non-woven cloths, although contradictory results have also been obtained in some studies (e.g., with microbiological and organic soil). According to some studies the cloths made from microfibre and ultra-microfibre have a good cleaning effect even without the use of cleaning chemicals, which brings potential environmental, human health and economic benefits. However, cleaning agents are beneficial in some cases. The microfibre cloths can be washed and reused up to 300 times or more, which emphasises the importance of the hygienic result

of laundering. When cleaning sensitive surfaces the possible damage to the surface caused by a microfibre cloth should be taken into account if it has picked up abrasive particles during use. In many studies cited the effectiveness of microfibre cloths in removing microbial soil from surfaces was shown to be better than that of conventional cotton or non-woven cloths, but the review shows that there is not a unanimous truth about the superiority of microfibre cloths, since differences between microfibre cloth types were observed in several studies. Unfortunately, detailed comparison of the results was difficult because of great variation in the parameters of the cloths and in experimental procedures in the different studies. More studies should be carried out to examine in greater detail the relationship between the characteristics or features of different microfibre cloths with respect to their performance. The results could be used as an information source in households as well as in professional cleaning, and also as a basis for further studies.

Biography

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The influence of anolyte as an environmentally friendly disinfectant on the strength properties of cotton, polyester/cotton and polyester

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Abstract

Usually textile materials are treated with chemicals like sodium hypochlorite and temperatures up to boiling point to make it sterile. This poses two potential problems: (1) it has a negative effect on strength properties of the textile fabric; (2) the harmful chemicals are discarded into the environment. Therefore the aim was to determine if anolyte could be an environmentally friendly and effective replacement for chemicals such as sodium hypochlorite and also be effective without such high temperatures. A process has been developed where electro-chemically activated water is produced by an anode-cathode system and the process is described as a change of the molecular state of the water. After production the anolyte exists in a metastable state while containing many free radicals and a variety of molecules and very high oxidation-reduction potential. It returns to a stable state after 48 hours and become inactive again and therefore it is not a threat to the environment when discarded after use. AATCC Test Method 61-2009 was used with the LaunderOmeter. Wash liquors included filtered water, Phosphate reference detergent B, sodium hypochlorite and anolyte. Temperatures were maintained at 24, 30 or 60°C. The cotton, polyester/cotton and polyester were laundered for 5, 10 or 20 cycles respectively. The tensile strength tests were conducted with the Instron Tensile Tester and ISO/SANS 13934-1:1999 test method. The tearing strength tests were conducted with the Elmendorf Tearing Strength tester as per ASTM Test Method D 1424–63. It was determined that the tensile strength of the polyester, cotton and polyester/cotton didn't decrease with an increase in laundering cycles. However, the combination of temperature and number of cycles resulted in a decrease in strength. Tearing tests indicated that the cotton showed a decrease in strength with the number of cycles and incline in temperature. The polyester/cotton showed a slight decrease in tearing strength with the increase of temperature and number of cycles. Polyester showed no change in tensile properties. This study was aimed to evaluate the effect of the anolyte on the textile fabrics in comparison with other washing agents. The results lead to the conclusion that the anolyte do not affect the textile fabrics more negatively than the detergent and sodium hypochlorite combination, and could therefore be a successful alternative.

Key words: Anolyte, tearing strength, tensile strength, cotton, polyester

Introduction

The control of microorganisms on textile fabrics in diverse areas such as the health care and food industry is necessary and often problematic. Presently there are a wide range of disinfectants available, but unfortunately the number of pathogens resistant to liquid chemical germicides is increasing (Bakhir *et al.*, 2003). There is a need and interest for a practical disinfectant with effective antimicrobial treatment (Venkitanarayanan *et al.*, 1999). The most important factor is to develop a sustainable disinfectant, which will have little or no effect on the environment or resources.

The chemical agents, glutaraldehyde, the association of peracetic acid/hydrogen peroxide (0.5%-2%) and sodium hypochlorite (1%) are the most commonly used high level disinfectants. For medium level disinfection sodium hypochlorite (0.3% - 0.5%), iodophors, phenol derivatives, 70% ethyl alcohol and 92% isopropyl alcohol are generally used. Quaternary ammonium compounds and low concentration sodium hypochlorite (0.2%) are used for low level cleaning and disinfection (Bouzada *et al.*, 2010). Unfortunately, disinfection with high doses of chlorine is undesirable, because it can lead to the formation of mutagenic chlorinated by-products (Lehtola *et al.*, 1999).

Textiles can be disinfected by boiling at 100°C for 30 minutes, but not all textiles can withstand such treatment and heat sensitive textiles have to be disinfected with chemicals. In some instances heat-sensitive laundry is immersed in disinfectants for up to 12 hours at room temperature. Heat sensitive laundry may also be treated in laundry machines which allow control of detergent concentration, proportion of laundry to water, temperature and contact time. For chemo-thermal disinfection, the temperature should reach at least 40°C and the active ingredients of the detergents are aldehydes, quaternary ammonium compounds, phenolics, and chlorine releasing agents (Paulus, 2005).

Electrochemical activation is both physical and chemical, and combines electrochemical and electrophysical actions (Lobyshev, 2007). A process has been developed where electrochemically activated water is produced by an anode-cathode system. The inventors describe the process as a change of the molecular state of the water (Marais, 2000) where the only raw products used are water and diluted NaCl. The dilute NaCl solution passes through a unit containing a flow-through electrolytic module that comprises an anode (titanium cylinder with special coating), that fits inside a cathode (hollow titanium coated cylinder). A ceramic membrane separates the electrodes. The electrochemically activated anolyte has a high oxidation potential and a pH of below 2.5 (Park *et al.*, 2009) and a high concentration of dissolved chloride and oxygen, which functions as a bactericide (Nakae & Inaba, 2000).

Anolyte is one of the potential alternatives for environmentally friendly broad spectrum antimicrobial activity for pathogens such as *Escherichia coli* O157:H7, *Listeria monocytogenes* and *Bacillus cereus* (Kim, *et al.*, 2000; Park *et al.*, 2002; Fabrizio & Cutter, 2005). Anolyte is successfully used as a disinfectant in different fields such as agriculture, dentistry and medicine (Ayebah & Hung, 2005), but not yet in the textile industry.

Park *et al.* (2002) summaries the many advantages to using anolyte as follows: a non-thermal antimicrobial treatment; NaCl is the only chemical required; the strong antimicrobial effect

prevents contamination of the processing environment; on-site production where anolyte is produced on demand at the correct concentration for direct use; less potential as a health hazard to workers. Huang *et al.*, (2008) indicated that the most important advantage of the anolyte is safety. Although the anolyte is a strong acid, it is not corrosive to skin, mucous membranes or organic material. A life cycle assessment of anolyte and its production may indicate that it is more beneficial to the environment than other chemicals such as sodium hypochlorite.

The raw material for the production of anolyte is water and NaCl. The production process requires energy, but the apparatus is simple and concise and lower energy consumption is experienced. Anolyte production causes no effluent or gas emissions and unused anolyte reverts to "ordinary water" after a few days. On-site production precludes packaging and transport. These combined factors contribute to a decreased environmental and an increased sustainability of the product.

Aim

Usually textile materials are treated with chemicals such as sodium hypochlorite. The chemicals are detrimental to the environment and the high temperatures up to boiling point needed for sterilization requires energy (electricity). The process poses two potential problems in that there is a negative effect on strength properties of the textile fabric, and harmful chemicals are discarded into the environment. The aim of this study was to determine whether anolyte could be used as a successful disinfectant without damaging the textile fabric to the extent of other disinfecting agents. Therefore the tensile strength and tearing strength of cotton, polyester and polyester/cotton was evaluated after laundering procedures.

Materials

Preparation of wash liquids

Anolyte was prepared through the electrochemical activation of water. A 5% NaCl water solution was activated by passing through a Hoshizaki ROX-10WB-E unit. Anolyte and catholyte were separately produced through pipes at the bottom of the unit at 1-1.5 L/min. The anolyte had a pH 2.2-2.4 and an oxidation reduction potential (ORP) of 1050-1190 mV. The anolyte was used within 90 minutes of preparation.

The detergent solution was prepared by mixing ECE Phosphate Reference Detergent Type B without optical brightener with filtered water. The amount of detergent was calculated as prescribed in the test method to be 0.15% of the total volume with a pH 9.35-9.45.

The amount of sodium hypochlorite bleach solution was calculated as follows: $4.54 / \% \text{NaOCl} = \text{mass (g) to add}$. The correct amount of sodium hypochlorite (Merck, 8.14815.1000) was weighed and added to the filtered water and laundry detergent solution, which had a pH 9.4-9.55.

Filtered water was prepared by passing tap water through a four-phase filtering system, containing 5 micron filters and carbon filters. The filtered water had a pH 8.3-8.5.

Textile fabrics were purchased from Testfabrics, Inc. Plain woven fabrics were used and comprised 100% cotton with a weight of 0.33 g per 50 mm², 100% Dacron (polyester) with a weight of 0.40 g per 50 mm² and 50/50 polyester/cotton blend with a weight of 0.30 g per 50 mm². Polyester, cotton and polyester/cotton were chosen because most textile articles used in the medical and food industry that have to be sterilised are made of these fibres.

Methods

The AATCC Test Method 61-2009 was used and textiles were laundered with the Launderometer. Wash liquids included filtered water, Phosphate Reference Detergent B, sodium hypochlorite, and anolyte. Temperatures were maintained at 24°C, 30°C and 60°C. The cotton, polyester/cotton and polyester were laundered for 5, 10 and 20 cycles, respectively. Untreated fabric samples were included as a control.

Tensile strength tests, measured in Newton, were conducted with the Instron Tensile Tester and ISO/SANS 13934-1:1999 test method. Tearing strength tests, measured in millinewton, were conducted with the Elmendorf Tearing Strength tester as per ASTM Test Method D 1424-63.

The mean tensile and tearing strengths of the textiles were determined after temperature and laundering cycle treatments. An analysis of variance (ANOVA) was calculated and significance indicated as $P \leq 0.05$ (Viljoen & Van der Merwe, 2000:12-1).

Results and discussion

Tensile strength

All the treatments caused an increase in maximum load required to break the weft yarns of the cotton fabric. The anolyte and the water had the smallest influence on the cotton weft yarns, while the detergent had the largest influence and required the highest maximum load to break the weft yarns. There was a significant difference between detergent and the anolyte ($P < .0001$). Detergent is an alkaline solution and this could be the reason for the increase in maximum load necessary to break the yarns after laundering. The alkali treatment can improve the tensile strength of cotton fabric by giving rise to a lattice conversion of the cellulose (Tanczos *et al.*, 2000; Bledzki *et al.*, 2004). The chlorine solution also caused a larger increase in maximum load which could also be expected because the chlorine solution contained the same amount of detergent but damage could have been caused by the sodium hypochlorite (Sun *et al.*, 2001). There was a significant difference between chlorine and anolyte ($P = 0.0020$). As expected there was only a significant difference in the maximum load after twenty cycles ($P = 0.0241$).

In contrast to the weft, the untreated warp yarns carried the largest maximum load, and water had the largest influence on the warp yarns. The hydrophilic character of cotton facilitates water absorption and promotes faster degradation of the matrix interface and

subsequently, destructively affects the tensile strength (De Carvalho *et al.*, 2009). There was a significant difference between all the treatments on the warp yarns of the cotton fabric. The influence of laundering cycles was also significant. The loss in maximum load was from 24°C to 30°C and from 24°C to 60°C, was similar.

Table 1 Influence of treatment, temperature, and laundering cycles on the tensile strength (mean maximum load) of cotton fabric.

DIRECTION		Mean (N)	Difference	P-value	
WARP	NO TREATMENT	547			
WARP	TREATMENT		(Relative to Anolyte)		
	Anolyte	484.62			
	Chlorine	498.26	-13.64	0.0011*	
	Detergent	514.03	-29.42	<.0001*	
	Water	472.92	-11.70	0.0049*	
	TEMPERATURE	24°C	505.69	(Relative to 24°C)	
		30°C	485.95	-19.74	<.0001*
		60°C	485.73	-19.95	<.0001*
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	500.35		
		10	493.89	-6.47	0.0715
		20	483.13	-17.22	<.0001*
WEFT	NO TREATMENT	301			
WEFT	TREATMENT		(Relative to Anolyte)		
	Anolyte	329.28			
	Chlorine	345.15	-15.86	0.0020*	
	Detergent	349.77	-20.49	<.0001*	
	Water	329.41	-0.13	0.9803	
	TEMPERATURE	24°C	339.14	(Relative to 24°C)	
		30°C	334.09	-5.05	0.2533
		60°C	341.98	2.85	0.5182
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	331.15		
		10	342.94	11.79	0.0079*
		20	341.12	9.97	0.0241*

Note: *Significant

In contrast with the cotton fabric, the detergent had the smallest influence on both directions of the polyester fabric, while the anolyte and the water had the largest influence on the polyester fabric. Significant differences in the warp direction were found for the anolyte and the detergent ($P < .0001$), as well the anolyte and the chlorine solution ($P < .0001$).

However, in the weft direction the difference was only significant between the anolyte and the detergent (P = 0.0031). The detriment caused by the anolyte could possibly be due to the low pH (2-3) or the high ORP. Differences in temperature were not significant, with a very small difference of only 2 N between 30°C and 60°C. The number of cycles had a larger effect on the weft yarns, but no significant differences were found. Munshi *et al.* (1992) also indicated a decrease in tensile strength of polyester fabrics after laundering procedures.

Table 2 Influence of treatment, temperature, and laundering cycles on the tensile strength (mean maximum load) of polyester fabric.

DIRECTION		Mean maximum load (N)	Difference	P-value	
WARP	NO TREATMENT	1256			
WARP	TREATMENT		(Relative to Anolyte)		
	Anolyte	1092.31			
	Chlorine	1167.08	-74.77	<.0001*	
	Detergent	1173.08	-80.77	<.0001*	
	Water	1097.47	-5.16	0.75	
	TEMPERATURE	24°C	1139.99	(Relative to 24°C)	
		30 °C	1129.82	-10.18	0.4686
		60 °C	1127.63	-12.37	0.3675
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	1129.94		
		10	1134.40	4.46	0.7454
		20	1133.09	3.15	0.8221
WEFT	NO TREATMENT	645			
WEFT	TREATMENT		(Relative to Anolyte)		
	Anolyte	622.61			
	Chlorine	634.65	-12.04	0.0840	
	Detergent	643.34	-20.73	0.0031*	
	Water	629.52	-6.92	0.3200	
	TEMPERATURE	24°C	635.30	(Relative to 24°C)	
		30 °C	638.69	3.39	0.5731
		60 °C	623.59	-11.71	0.0524
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	634.15		
		10	639.43	5.28	0.38
		20	624.01	-10.14	0.09

Note: *Significant

Table 3 Influence of treatment, temperature, and laundering cycles on the tensile strength (mean maximum load) of polyester/cotton fabric

DIRECTION		Mean maximum load (N)	Difference	P-value
WARP	NO TREATMENT	673		
WARP	TREATMENT		(Relative to Anolyte)	
	Anolyte	678.85		
	Chlorine	683.58	-4.73	0.1040
	Detergent	686.30	-7.45	0.0107*
	Water	680.28	-1.42	0.6234
	TEMPERATURE	24°C	(Relative to 24°C)	
		30 °C	-2.64	0.2948
		60 °C	-3.29	0.1920
	NUMBER OF LAUNDERING CYCLES		(Relative to 5 cycles)	
		5	683.87	
		10	684.41	0.54
		20	678.48	-5.39
WEFT	NO TREATMENT	331		
WEFT	TREATMENT		(Relative to Anolyte)	
	Anolyte	342.09		
	Chlorine	347.82	-5.72	0.0423*
	Detergent	350.40	-8.21	0.0037*
	Water	349.11	-7.01	0.0130*
	TEMPERATURE	24°C	(Relative to 24°C)	
		30 °C	1.29	0.5963
		60 °C	3.65	0.1342
	NUMBER OF LAUNDERING CYCLES		(Relative to 5 cycles)	
		5	342.15	
		10	348.09	5.94
		20	351.76	9.60

Note: *Significant

There was only a small variation in the effect of the treatments on polyester/cotton fabric, but significant differences were indicated in the weft direction for all treatments when compared to the anolyte. The detergent, yet again had the largest effect on the polyester/cotton fabric, while the anolyte had the smallest influence in both directions. Temperature had no significant influence on the maximum load that the fabric could carry. As with the polyester fabric the polyester/cotton fabric showed an increase in the maximum

load as the number of cycles increased in the weft direction. Normally this would be explained by shrinkage but in this case no shrinkage was found.

Tearing strength

Table 4 Influence of treatment, temperature, and laundering cycles on the tearing strength of cotton fabrics.

DIRECTION		Mean tearing force (mN)	Difference	P-value	
WARP	NO TREATMENT	376			
WARP	TREATMENT		(Relative to Anolyte)		
	Anolyte	244.67			
	Chlorine	213.17	31.50	<.0001*	
	Detergent	219.78	24.88	0.0002*	
	Water	231.06	13.16	0.0432*	
	TEMPERATURE	24°C	284.54	(Relative to 24°C)	
		30 °C	223.46	-61.08	<.0001*
		60 °C	173.50	-111.04	<.0001*
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	228.08		
		10	259.96	31.88	<.0001*
		20	193.46	34.63	<.0001*
WEFT	NO TREATMENT	341			
WEFT	TREATMENT				
	Anolyte	229.56			
	Chlorine	218.67	10.89	0.1713	
	Detergent	201.28	28.28	0.0004*	
	Water	222.83	6.72	0.3979	
	TEMPERATURE	24°C	217.17	(Relative to 24°C)	
		30 °C	256.63	39.46	<.0001*
		60 °C	180.46	-36.71	<.0001*
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	200.17		
		10	266.42	66.25	<.0001*
		20	187.67	-12.50	0.0701

Note: *Significant

The untreated cotton fabric carried the largest load, while the detergent had the largest influence on the weft direction and the chlorine solution had the largest influence on the warp direction. Fijan *et al.* (2007) also found that bleaching agents caused more damage than detergent and water. In the warp direction there were significant differences for all the

treatments, while in the weft direction the only significant difference was between the anolyte and the detergent (P = 0.0004). The temperature had a significant effect on the tearing strength in both directions and for both 30 °C (P<.0001) and 60 °C (P<.0001). There was an increase in tearing strength in both directions from five to ten cycles and then a decrease from ten to twenty cycles. Both these differences were found to be significant in the warp direction (both P<.0001.), while only the increase from five to ten cycles were significant in the weft direction (P<.0001).

Table 5 Influence of treatment, temperature, and laundering cycles on the tearing strength of polyester fabrics

DIRECTION		Mean tearing force (mN)	Difference	P-value	
WARP	NO TREATMENT	998			
WARP	TREATMENT		(Relative to Anolyte)		
	Anolyte	737.44			
	Chlorine	850.28	-112.83	<.0001*	
	Detergent	834.28	-96.83	<.0001*	
	Water	748.33	-10.89	0.2041	
	TEMPERATURE	24°C	799.92	(Relative to 24°C)	
		30 °C	794.46	-5.46	0.4620
		60 °C	783.38	-16.54	0.0263*
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	851.13		
		10	764.96	-86.17	<.0001*
		20	761.67	-89.46	<.0001*
WEFT	NO TREATMENT	922			
WEFT	TREATMENT				
	Anolyte	814.61			
	Chlorine	680.28	134.34	<.0001*	
	Detergent	700.67	113.94	<.0001*	
	Water	806.17	8.44	0.3510	
	TEMPERATURE	24°C	746.71	(Relative to 24°C)	
		30 °C	749.08	2.38	0.7618
		60 °C	755.50	8.79	0.2623
	NUMBER OF LAUNDERING CYCLES			(Relative to 5 cycles)	
		5	739.46		
		10	756.17	16.71	0.0336*
		20	755.67	16.21	0.0392*

Note: *Significant

The chlorine solution had the largest influence on the polyester fabric in the weft direction, while the anolyte had the smallest. Fijan *et al.* (2007) also found that laundering with bleaching agents can lead to a decrease in strength. Unfortunately in the warp direction the anolyte caused the largest decrease in tearing strength while the chlorine solution had the smallest effect. In both directions the difference between influence of the anolyte and the detergent, as well as the anolyte and the chlorine solution were significant. The anolyte and the water had no significant difference. The increase in temperature caused a decrease in tearing strength in the warp direction and there was a significant difference between 24°C and 60°C (P = 0.0263). The number of laundering cycles also had a significant influence in both directions. However, in the warp direction the tearing strength decreased as the number of cycles increased which was expected, but in the weft direction the tearing strength increased with the number of laundering cycles.

Table 6 Influence of treatment, temperature, and laundering cycles on the tearing strength of polyester/cotton fabrics.

DIRECTION		Mean tearing force (mN)	Difference	P-value	
WARP	NO TREATMENT	319			
WARP	TREATMENT		(Relative to Anolyte)		
	Anolyte	329.67			
	Chlorine	261.94	67.72	<.0001*	
	Detergent	292.28	37.39	<.0001*	
	Water	308.67	21.00	0.0137*	
	TEMPERATURE	24°C	(Relative to 24°C)		
		30 °C	23.79	0.0013*	
		60 °C	16.38	0.0263*	
	NUMBER OF LAUNDERING CYCLES		(Relative to 5 cycles)		
		5	326.75		
		10	305.29	-21.446	0.0037*
		20	262.38	-64.38	<.0001*
WEFT	NO TREATMENT	634			
WEFT	TREATMENT				
	Anolyte	393.28			
	Chlorine	327.56	65.72	<.0001*	
	Detergent	354.54	38.73	<.0001*	
	Water	401.39	-8.11	0.3942	
	TEMPERATURE	24°C	(Relative to 24°C)		
		30 °C	417.46	75.43	<.0001*
		60 °C	348.08	6.05	0.4630
	NUMBER OF LAUNDERING CYCLES		(Relative to 5 cycles)		
		5	429.83		
		10	370.24	-59.59	<.0001*
		20	307.50	-122.33	<.0001*

Note: *Significant

In the warp direction the anolyte required the largest tearing force, even larger than the untreated polyester/cotton fabric while the chlorine solution required the smallest tearing force. There were significant differences between the influences of all the various treatments as well as temperature and laundering in the warp direction. In both the directions the tearing strength decreased as the number of cycles increased. In the weft direction the water required the largest tearing force and the chlorine solution required the smallest tearing force. In the weft direction the difference between the influence of the anolyte and the water was not significant. There was only a significant difference between 24 °C and 30 °C ($P < .0001$) in the weft direction.

Conclusion

This study aimed to evaluate the effect of the anolyte on the textile fabrics in comparison to detergent and sodium hypochlorite, in order to establish anolyte as an environmentally safe alternative. Most significant differences were found between the anolyte and the detergent or sodium hypochlorite solution, while the influences of the filtered water and the anolyte were closely related. The anolyte was not more detrimental to the mechanical properties of the cotton, polyester or polyester/cotton than the detergent or sodium hypochlorite solution. However, the all the laundering agents had a larger influence on the cotton fabric than the polyester or the polyester/cotton. The temperature and amount of cycles did not cause more damage by the anolyte than the other laundering agents. Therefore the anolyte does not affect the textile fabrics more negatively than the detergent and sodium hypochlorite combination, and could therefore be a successful alternative, which would be less harmful to the environment and user.

Biography

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Standards as context for reform: Building capacity and sustainability through Home Economics education

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Abstract

Strong evidence supports the need for education focused on nurturing human development with schools identified as key to such efforts. At the same time, a lack of consensus on positive youth outcomes has been cited as undermining our capacity to raise healthy, high-achieving children. These issues concerning preventive education as means to building capacity and sustainability are central to the field of Home Economics. In the USA, National Standards Family and Consumer Sciences (Home Economics) Education (FCSE) were developed to reflect foundational knowledge, skills, and dispositions essential for effective functioning in one's personal, family, career, and community life. These standards are based on a vision of emancipatory education with the intent of fostering positive youth development. However, with the focus of USA education reform and accountability on math and reading, FCSE has been increasingly marginalised and experienced serious decline in secondary schools.

Providing increased and equitable student access to learning opportunities related to the FCSE Standards would require significant policy and institutional reform. As key stakeholders are central to successful reform, this study explored the attitudes and perceptions of educational leaders concerning the efficacy of FCSE National Standards in public education. Data were collected from educational leaders on the FCSE National Standards with respect to importance, current student access, and support for increased access. Findings revealed the majority of respondents indicating high levels of importance, minimal student access, and strong support for increased access.

Keywords: Advocacy; Curriculum; Education Policy; Education Reform; Education Standards; Positive Youth Development; School Reform; Sustainable Development.

Introduction

There is overwhelming and growing evidence to support the need for education focused on nurturing human development, with parents and schools identified as key to such efforts (Kerka, 2001; McDermott, 2002; Morton, 2005; Pearson, 2003; Whitehead, 2004). Such preventive education as means to building capacity and sustainability are central to the field of Home Economics. In the USA, National Standards for Family and Consumer Science Education (NASAFACS, 1998) were developed based on a vision of “empower[ing] individuals and families...to manage the challenges of living and working in a diverse, global society.” Despite strong evidence supporting the need for such education—designed with express intent to improve quality of life for individuals, families, and communities—FCSE has been increasingly marginalised over the past two decades of standards-based reform (Chadwick, 2004; Madsen, 2004). Since the publication of *A Nation at Risk* (NCEE, 1983) and the national

education standards project to follow, education reform has focused on the “core” content areas of reading/language arts, mathematics and science (Kosar, 2003). Madsen (2004) asserts that FCSE National Standards are not considered part of educational reform and accountability in the national and state landscape. Accordingly, FCSE has experienced serious decline with classes and programs eliminated from middle and secondary schools (Chadwick, 2004). The problem of this study concerns these assertions of declining student access to learning opportunities associated with FCSE National Standards, as well as the potential of the Standards to serve as an empowerment model for youth development in public education.

Research demonstrates that the attitudes and perceptions of key stakeholders are central to the success of any proposed change or innovation (Fullan, 2000; Huberman & Miles, 1984). In the realm of school reform, educational leaders serve as key stakeholders, having the capacity, power, and influence to design, organise, and plan the work of our schools (Lovett, 2003). Review of the literature further suggests that involving educational leaders in decision-making increases the probability of achieving real, lasting school reform (McGahn, 2002). As such, the purpose of this study was to explore the attitudes and perceptions of educational leaders concerning the efficacy of FCSE National Standards to serve as an empowerment model for youth development in public education, as well as estimates of current student access.

The study was limited to seven (7) foundational FCSE National Standards potentially relevant for all students, excluding those specifically articulated as being “required for careers” in Family and Consumer Sciences-related occupations. Research suggests that these seven (7) of the sixteen (16) National Standards are perceived as being distinctly more important (Pullen, 2001); consumer and family living context areas are commonly emphasised in secondary schools, while career preparation context areas are somewhat ignored (Chen, 2002). These seven comprehensive standards reflect knowledge and skills identified by the field as being essential for effective functioning in one’s personal, family, career, and community life:

1. Career, Community, and Family Connections
2. Consumer and Family Resources
3. Family
4. Human Development
5. Interpersonal Relationships
6. Nutrition and Wellness
7. Parenting

The following research questions were developed to address this study:

1. What is the perceived importance among educational leaders for all students to have access to learning opportunities associated with FCSE National Standards?
2. What is the perceived estimate among educational leaders of current student access to learning opportunities associated with FCSE National Standards?
3. What is the level of support among educational leaders to increase access for all students to learning opportunities associated with FCSE National Standards?

Review of the literature

Literature in the areas of positive youth development (PYD) and school change provide the foundation for this study. Drawing from several theoretical perspectives of human development, PYD is an ecological, strength-based view of adolescent development within diverse youth and communities (Lerner, 2005), seeking to promote the variety of developmental competencies that young people need to become productive, contributing members of society (Catalano, Berglund, Ryan, Lonczak & Hawkins, 2004; Durlak *et al.*, 2007; Porter, 2010).

Lerner (2005) emphasises that the key to ensuring the positive development of youth rests on developing research-based policies that strengthen the capacities of families to raise healthy, thriving children. Such policies should focus on enhancing the fit between the developmental capacities of youth and the assets for positive development that exist in their families, schools, and communities (Lerner, 2005). Adolescence may be the most critical ontogenetic period within which to direct such policy, whereby “young people may thrive and civil society may prosper” (Taylor *et al.*, p. 87, 2005). Examining this construct in the context of FCSE National Standards indicates strong relevancy in terms of education related to human development, family systems, parenting, interpersonal relationships, consumer and family resources, and nutrition and wellness.

Change theory

A theoretical perspective of school change, with emphasis on the Concerns-Based Adoption Model (CBAM), suggests that school administrators are central to examining current practice as well as influencing education reform initiatives. Change or innovation is defined as any significant alteration in the status quo, usually intended to benefit people by making their situation better in some way (Havelock & Zlotolow, 1995). Most research organises the change process into three broad phases, the first of which is initiation and mobilization, including the processes that led up to the decision to adopt or proceed with a change (Fullan, 2004). Perceptions and attitudes concerning the importance of an innovation have been found to be central to the willingness of educators to adopt change (Huberman and Miles, 1984). The mental models, attitudes, and perceptions of educational leaders will ultimately influence whether or not new innovations are welcomed or squelched (Lovett, 2003). Fundamental to the success of educational change are those impacting the culture of institutions rather than implementation of a single innovation (Fullan, 2004).

The second phase, levels of use, examines behaviour and portrays how people act with respect to specified changes. Levels of use initially identify change participants as users/nonusers of an innovation and subsequently define levels within each of these categories (Loucks, Newlove, & Hall, 1975). It should be noted that within the context of this study exists current practice and policy supporting student learning opportunities related to FCSE Standards (Werhan & Way, 2006).

The third phase, innovation configurations, focuses on describing the operational forms an innovation can take (Hall & Hord, 1987). Users of innovation frequently adapt an innovation to fit their situation. The concept of innovation configurations addresses both the idealised form of an innovation that might be conceptualised by a developer and the various operational forms of the change that could be observed in a classroom (Hall & Hord, 2001). Despite lack of widespread support and equitable access for FCSE, innovative practice can be well documented (Werhan & Way, 2006).

The three levels of change identified in the CBAM instrument provide a comprehensive framework for investigating the perceived efficacy of the FCSE National Standards to serve as an empowerment model for youth development. The diagnostic tools of the CBAM are generic in nature; therefore an instrument using this framework was developed specific to the questions of this study.

Positive youth development

Review of the literature provides strong theoretical and empirical evidence supporting the need for learning opportunities associated with the FCSE National Standards. Concern about the well-being of youth among scholars, professional organizations, government agencies, and other public and private sectors has generated a plethora of research related to the content areas of FCSE (Kerns & Prinz, 2002; Massey-Stokes, 2002; McDermott, 2002; Morton, 2005; Reading, 2006; Silverman, Raj, Mucci, & Hathaway, 2001; Weir, 2005; Wekerle & Wolfe, 1999). There is a growing body of literature on positive youth development, focused on promoting healthy interpersonal relationships, pre-parenting education, financial literacy, nutrition and wellness. In each of these areas of concern, schools are identified as key to prevention efforts and promoting positive youth development (Gaudin, 1993; Gazda, Asbury, Balzer, Childers, & Walters, 1991).

Research method

A survey instrument—An Empowerment Model for Youth Development: Attitudes & Perceptions of Educational Leaders—was developed and contained two main sections. Part I of the instrument consisted of items related to constructs of the study as defined by FCSE National Standards. A matrix design was applied to address each of the dependent variables—Importance, Access, and Support—in the context of content standards for each of the seven FCSE comprehensive standards. Part II of the instrument consisted of items asking respondents for information about themselves and their school characteristics. Reliability estimates for internal consistency were calculated at .96 for all items using Cronbach's Coefficient Alpha.

The survey was electronically distributed to all middle school and high school principals, career-technical education directors, curriculum directors, and special education directors in a state of the northeast region of the USA ($n = 312$). One hundred thirty completed questionnaires were received at the close of the survey period, for a return rate of 42%. Response rates for each subgroup are summarised in Table 1 by frequencies and percentages. Additionally, data from 25 randomly selected non-respondents—found not to differ from volunteer respondents—was included in the analysis for a final return rate of 50% on selected items.

Descriptive and analytical methods were applied with SPSS, utilizing non-parametric statistics to determine findings. Frequencies, percentages, measures of central tendency and variability were calculated, as well as a Chi-Square analysis and Kruskal-Wallis Test. Data were charted to display frequency percentages and medians for all dependent variables with respect to Importance, Access, and Support.

Research findings

While there was balanced representation by gender, the majority of respondents were principals (52%), 50 years of age or older (60%), with advanced degrees of Masters +30 or greater (72%), less than five years of experience in their current position (46%), and strong influence or final authority in curriculum decision-making (62%). Organizational demographics showed all geographical regions of the state equally represented, the majority of which were rural (77%) and almost evenly split between schools with less than 500 students (49%) and schools with more than 500 students (51%). All participants were found to be working with students at the middle school level or higher—the target population for this study—some with PreK-12 (33%) and others with only grades 9 - 12 (27%).

The research questions central to this study concerned the attitudes and perceptions of educational leaders with respect to each of the FCSE National Standards: (1) the importance of access to learning opportunities associated with the Standards for all students; (2) estimate of current student access; and, (3) support for increased access for all students. Analysis of the data indicated that a strong majority (75%) of the participants felt that student access to learning opportunities for most (90%) of the FCSE National Standards was important to extremely important, as summarised in Table 2. Standards identified as being of greatest importance were in the areas of career education, interpersonal relations, and parenting. With respect to current student access to FCSE, the majority (50%) of respondents indicated there was minimal access or no access to student learning opportunities for all of the FCSE National Standards (Table 3). Findings suggest the weakest areas of access are in consumer resource management and parenting education. Finally, a majority of respondents (62%) were found to support or strongly support increased access for all students to learning opportunities associated with all of the FCSE National Standards as illustrated in Table 4. Strongest areas of support were employability skills, financial literacy, diversity, interpersonal relations, and parenting education. Given the response rate ($n = 150$), these findings can be generalised to the full population ($n = 312$) of educational leaders in this north-eastern USA state during the 2005-2006 academic year at a 95% confidence level.

Theoretical and practical implications

Findings of this study further reinforce the importance, need, and support for increased student access to learning opportunities associated with the FCSE National Standards. At the same time, there is recognition that current education policy and funding, as defined by the No Child Left Behind Act, presents a challenge to implementing such programs. Educational leaders are understandably overwhelmed and have legitimate concerns of diverting attention and resources from academic curriculum. However, there is evidence that the relationship between academic and social/emotional learning may be synergistic, suggesting that achievement in one helps the other (Lawton & Tzalas, 1994). Further, an approach that gives centrality to the principles of child and adolescent development can improve academic learning for all students and, at the same time, encourage behaviour that gives students a better chance for success in school and life (Comer, 2005).

The disparity in perceived estimates of current student access with those of importance and support among participants may have numerous implications. First, it may suggest a lack of awareness, understanding, and/or definition of FCSE. FCSE National Standards as currently configured lack definition, an alphabetised list of both comprehensive and career-related standards without delineation between the two realms. Further, the integrative nature of State Standards guiding instruction and assessment in the population of this study are without definition or identification of the field and may further contribute to this lack of awareness and understanding of FCSE.

Another implication of this finding may be the institutional structure of FCSE in conjunction with Career-Technical education. FCSE programs, policy, and funding have historically been aligned with those of Vocational/Career-Technical education, preparing students for the unpaid work of the family and related wage-earning careers. In an earlier era when “unpaid work of the home” was a viable and somewhat culturally-mandated career option for women, the connection with vocational education had some degree of credibility. However, given the dramatic societal changes of recent decades, this exclusive alliance with Career-Technical education is called into question. When comparing the FCSE standards applied in this study with those of comprehensive health education, many commonalities can be found in both content and quantity. However, comprehensive Health Education is not institutionally associated with career-related Health education, that is, Occupational Health training programs in Career-Technical education. Conversely, the current structure of the FCSE National Standards includes both comprehensive and career-related programs, as earlier discussed. The disparity between estimates of minimal student access with attitudes of strong support for FCSE suggests that maintaining this organisational structure alliance with Career-Technical education may be serving to isolate the field from the broader education community. This is not to negate the importance of career-related education, but rather to suggest that the field has evolved beyond pre-existing structures. In keeping with Dewey’s views of vocational education nearly a century ago (Griffin, 1994), FCSE could potentially provide a link between comprehensive and career-technical education, serving as a model to demonstrate connection and relationship between the two arenas.

Aside from institutional structure, research associated with positive youth development and school change (Gaudin, 1993; Gazda *et al.*, 1991) suggests the need for FCSE to partner with

key stakeholders in further developing and defining the essential knowledge and skills needed by all youth for successful transition to adulthood. There is strong evidence to suggest interest and receptiveness of external audiences in addressing these issues, providing opportunity to further explore the efficacy of FCSE National Standards to serve as an empowerment model for youth development. The critical importance of engaging educational leaders should again be noted, their concerns being central to understanding and facilitating the change process. Results of this study may serve as a foundation to move forward with this constituency in further developing and implementing the Concerns-Based Adoption Model (CBAM) with respect to these issues, thereby ensuring success in affecting positive change. Although this study was focused on the first two stages of the CBAM, participant responses may indicate that many educational leaders are approaching or already at the impact stage. Those who are at this advanced stage of the change process likely have had experience with existing FCSE program models. If so, these educational leaders may serve a key role in advancing adoption for those in the earlier stages. Although interest and support for increasing student access to FCSE is strong, successful implementation will require collaboration and support on many levels.

Recommendations for future research

Based on the findings of this study, the following recommendations are made for future research:

- The design and instrumentation of this study may serve as a model for further, more extensive investigation related to the questions of this research. A replication of this study with larger, more diverse populations of education stakeholders, such as state and local school boards, legislators, business/community leaders, parents, and/or teachers would serve to enhance the findings of this study. This recommendation is particularly relevant to those populations with far greater representation of cultural, racial, and ethnic diversity. Such studies would broaden generalizability and strengthen significance of findings with respect to potential group differences.
- Qualitative studies, including interviews and focus forums with students, teachers, parents, community members, and administrators, may help to further reveal the common concerns associated with FCSE, clarifying areas of strength and opportunity as well as those of weakness and challenge. Findings of such studies could serve to guide and advance future quantitative research efforts in education policy.
- Further exploration of organizational variables, legislative mandates, and the interaction of all elements of the educational system may help advance understanding of supports and constraints associated with student access to FCSE learning opportunities in school settings.
- A study comparing perceived estimates of student access to FCSE learning opportunities among various subgroups within educational systems would enhance the findings of this research. Research comparing perceived estimates with actual practice may also help to inform questions of FCSE program access.

- Since educational systems vary, a similar study in other regions may help to further advance the change process. Such research could help to identify models of established practice in areas of FCSE, such as parenting education and financial literacy. These models may serve useful in advancing adoption for those schools and educational systems currently lacking such programs.

Conclusion

Centred on the concepts of conflict resolution, problem-solving, human relationships, parenting, diversity, and personal development, FCSE Standards hold promise for re-engaging society with the value of learning life skills and nurturing human development. The FCSE National Standards provide a unifying focus for program development, instruction, and assessment. Potentially, they may serve to incorporate personal and family life education into the school curriculum, which before announcement of the FCSE National Standards had no consistent or well-defined substantive reference. They may serve also as a context for public discussion regarding (1) the essential knowledge associated with the FCSE vision; and, (2) the role of public education in meeting the FCSE National Standards. Coupled with more traditional economic indicators, the FCSE National Standards may serve as well to address some formerly elusive aspects of human capital. Just as educational level has historically been associated with wage earnings in human capital theory (Sweetland, 1996, 1997), student achievement in FCSE National Standards may serve as a measure of healthy psychosocial development, family strengths, and other quality of life indicators (e.g., nutrition, financial management, life planning). Lack of consensus on positive outcomes has been cited as undermining our collective capacity to raise healthy, high-achieving children, because parents, communities, youth leaders, and teachers lack a sense of what goals should be sought (Moore & Halle, 2001). Although the content and parameters of the FCSE National Standards may be subject to debate and revision, they represent a starting point for such dialogue.

There is strong evidence of urgency to focus research on the conceptual and organizational structure of Home Economics education, as reflected in the FCSE National Standards. Findings of this study suggest strong support and opportunity for expanded educational programs associated with FCSE core standards, independent of those associated with career-technical education. Lack of immediate attention to this issue may result in missing a window of opportunity to provide leadership for the broadly expressed concerns and needs of youth, as evidenced by the literature and findings of this study. Findings of this study may serve to inform education policy and practice within the field of Home Economics/FCSE, as well as the larger education community. In addition to potentially influencing the focus of current practice, the outcomes of this research may promote discussion concerning the potential for schools to better prepare students for adulthood as responsible, contributing family members and citizens. This, in turn, may suggest the need for policy changes, thereby ensuring equitable student access to instruction and assessment associated with the FCSE National Standards.

The future of Home Economics and FCSE initiatives is uncertain. While the need is great, other educational priorities coupled with current economic constraints threaten to extinguish access to FCSE curricula. This study reveals that access is weak but support is strong. Perhaps

future research will be conducted and, along with this study, spur increased attention to the problem. With the FCSE National Standards serving as a unifying focus, partnerships with related professions and stakeholders are needed to generate research and educational practice supporting student achievement in these critical areas that undergird our social fabric. Promoting student achievement of the FCSE National Standards may serve to enhance the adaptability and resilience of individuals and families. Empowering youth through FCSE may potentially increase our individual and collective capacity to meet the developmental needs of the next generation, thereby building capacity and sustainability of human capital.

Appendix A

“Core” National Standards for Family and Consumer Sciences Education (Comprehensive and Content)

- 1.0 Career, Family, and Community Connections—Integrate multiple life roles and responsibilities in family, career, and community.**
 - 1.1 Analyse strategies to manage multiple individual, family, career, and community roles and responsibilities.
 - 1.2 Demonstrate transferable and employability skills in community and workplace settings.
 - 1.3 Analyse the reciprocal impact of individual and family participation in community activities.
- 2.0 Consumer and Family Resources—Evaluate management practices related to the human, economic, and environment resources.**
 - 2.1 Demonstrate management of individual and family resources, including food, clothing, shelter, health care, recreation, and transportation.
 - 2.2 Analyse the relationship of the environment to family and consumer resources.
 - 2.3 Analyse policies that support consumer rights and responsibilities.
 - 2.4 Evaluate the impact of technology on individual and family resources.
 - 2.5 Analyse interrelationship between the economic system and consumer actions.
 - 2.6 Demonstrate management of financial resources to meet the goals of individuals and families across the life span.
- 6.0 Family—Evaluate the significance of family and its impact on the well-being of individuals and society.**
 - 6.1 Analyse the impact of family as a system on individuals and society.
 - 6.2 Demonstrate appreciation for diverse perspectives, needs, and characteristics of individuals and families.

- 12.0 Human Development—Analyse factors that impact human growth and development.**
 - 12.1 Analyse principles of human growth and development across the life span.
 - 12.2 Analyse conditions that influence human growth and development
 - 12.3 Analyse strategies that promote growth and development across the life span.
- 13.0 Interpersonal Relationships—Demonstrate respectful and caring relationships in the family, workplace, and community.**
 - 13.1 Analyse functions and expectations of various types of relationships.
 - 13.2 Analyse personal needs and characteristics and their impact on interpersonal relationships.
 - 13.3 Demonstrate communication skills that contribute to positive relationships.
 - 13.4 Evaluate effective conflict prevention and management techniques.
 - 13.5 Demonstrate teamwork and leadership skills in the family, workplace, and community.
 - 13.6 Demonstrate standards that guide behaviour in interpersonal relationships.
- 14.0 Nutrition and Wellness—Demonstrate nutrition and wellness practices that enhance individual and family well-being.**
 - 14.1 Analyse factors that influence nutrition and wellness practices across the life span.
 - 14.2 Evaluate the nutritional needs of individuals and families in relation to health and wellness across the life span.
 - 14.3 Demonstrate ability to acquire, handle, and use foods to meet nutrition and wellness needs of individuals and families across the life span.
 - 14.4 Evaluate factors that affect food safety, from production through consumption.
 - 14.5 Evaluate the impact of science and technology on food composition, safety, and other issues.
- 15.0 Parenting—Evaluate the impact of parenting roles and responsibilities on strengthening the well-being of individuals and families.**
 - 15.1 Analyse roles and responsibilities of parenting.
 - 15.2 Evaluate parenting practices that maximize human growth and development.
 - 15.3 Evaluate external support systems that provide services for parents.
 - 15.4 Analyse physical and emotional factors related to beginning the parenting process.

Appendix B

“Career-Related” National Standards for Family and Consumer Sciences Education (Comprehensive)

- 3.0 Consumer Services—Integrate knowledge, skills, and practices required for careers in consumer services.
- 4.0 Early Childhood Education and Services—Integrate the knowledge, skills, and practices required for careers in early childhood, education, and services.
- 5.0 Facilities Management and Maintenance—Integrate knowledge, skills, and practices required for careers in facilities management and maintenance.
- 7.0 Family and Community Services—Integrate knowledge, skills, and practices required for careers in family and community services.
- 8.0 Food Production and Services—Integrate knowledge, skills, and practices required for careers in food production and services.
- 9.0 Food Science, Dietetics, and Food Services—Integrate knowledge, skills, and practices required for careers in food science, dietetics, and nutrition.
- 10.0 Hospitality, Tourism, and Recreation—Integrate knowledge, skills, and practices required for careers in hospitality, tourism, and recreation.
- 11.0 Housing, Interiors, and Furnishings—Integrate knowledge, skills, and practices required for careers in housing, interiors, and furnishings.
- 16.0 Textiles and Apparel—Integrate knowledge, skills, and practices required for careers in textiles and apparel.

Biography

Barbara Woods completed her undergraduate degree in Home Economics education at Valparaiso University, Master of Arts in Teaching at the University of Vermont, and Ph.D. in Education Policy and Leadership at Ohio State University. Her experience includes 12 years of classroom teaching in Vermont and New York, as well as 14 years of state agency leadership and administration in Vermont and Ohio. Her research interests include studies in public education and social policy associated with equitable access to learning opportunities in Family and Consumer Sciences education. E-mail: woods@ecu.edu

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Tables

Table 1 Response Rates of Educational Leader Subgroups by Frequency and Percentage (n = 312)

Educational Leader Subgroups	(Expected) Population	Population Percentage	(Observed) Sample	Sample Percentage
Principals	179	57%	69	39%
Special Education Directors	68	22%	35	51%
Curriculum directors	43	14%	13	30%
Career-Technical Directors	22	7%	13	59%
	n = 312	100%	n = 130	42%

Table 2 Frequency Percentages and Median Values of Importance

Variable	Not Important	Somewhat Important	Important	Extremely Important	Median
1.0 Career, Community, & Family					
1.1 Roles/Responsibilities	1.5	16.2	50.8	31.5	3
1.2 Employability Skills	.0	5.4	36.9	57.7	4
1.3 Reciprocity	2.4	22.8	52.8	22.0	3
2.0 Consumer & Family Resources					
2.1 Resource Management	1.3	11.7	45.5	41.6	3
2.2 Environment	.7	16.4	51.3	31.6	3
2.3 Consumer Rights	1.3	38.2	48.0	12.5	3
2.4 Technology	2.7	28.7	54.0	14.7	3
2.5 Consumer Action	.7	23.5	54.9	20.9	3
2.6 Financial Literacy		12.3	44.8	42.9	3
3.0 Family					
3.1 Family Systems	.8	18.3	42.9	38.1	3
3.2 Diversity	.8	5.6	39.5	54.0	4
4.0 Human Development					
4.1 Principles	.8	20.0	58.5	20.8	3
4.2 Conditions	.8	15.4	64.6	19.2	3
4.3 Strategies	1.6	18.9	59.1	20.5	3
5.0 Interpersonal Relationships					
5.1 Functions/Expectations	.0	11.0	50.3	38.7	3
5.2 Personal Characteristics	.7	13.1	51.6	34.6	3
5.3 Communications	.0	3.3	32.0	64.7	4
5.4 Conflict Resolution	.0	4.6	30.5	64.9	4
5.5 Leadership Skills	.0	5.2	48.4	46.4	3
5.6 Behavioural Standards	.7	14.6	41.1	43.7	3
6.0 Nutrition and Wellness					
6.1 Wellness Factors	.0	5.5	60.2	34.4	3
6.2 Nutritional Needs	.0	8.6	59.4	32.0	3
6.3 Food Safety	.8	24.2	52.3	22.7	3
6.4 Food Preparation	1.6	21.3	55.9	21.3	3
6.5 Technology	2.4	37.0	45.7	15.0	3
7.0 Parenting					
7.1 Responsibilities	.0	7.3	36.7	56.0	4
7.2 Practices	.0	11.3	37.1	51.7	4
7.3 Support Systems	1.3	16.4	48.7	33.6	3
7.4 Readiness Factors	.7	11.8	30.3	57.2	4

Table 3 Frequency Percentages and Median Values of Current Access

Variable	None	Minimal	Adequate	More Than Adequate	Median
1.0 Career, Community, & Family					
1.1 Roles/Responsibilities	3.1	60.0	36.2	.8	2
1.2 Employability Skills	1.5	56.2	40.8	1.5	2
1.3 Reciprocity	4.8	63.5	31.0	.8	2
2.0 Consumer & Family Resources					
2.1 Resource Management	2.6	57.9	38.8	.7	2
2.2 Environment	3.9	58.2	37.9	.0	2
2.3 Consumer Rights	12.7	66.0	21.3	.0	2
2.4 Technology	10.0	59.3	30.7	.0	2
2.5 Consumer Action	7.9	66.9	25.2	.0	2
2.6 Financial Literacy	11.7	72.1	15.6	.6	2
3.0 Family					
3.1 Family Systems	4.0	66.4	29.6	.0	2
3.2 Diversity	3.3	54.1	41.8	.8	2
4.0 Human Development					
4.1 Principles	2.3	53.5	44.2	.0	2
4.2 Conditions	2.3	57.4	40.3	.0	2
4.3 Strategies	5.6	59.5	34.1	.8	2
5.0 Interpersonal Relationships					
5.1 Functions/Expectations	1.3	59.5	37.9	1.3	2
5.2 Personal Characteristics	3.3	60.8	35.3	.7	2
5.3 Communications	4.6	54.9	39.2	1.3	2
5.4 Conflict Resolution	5.3	62.9	31.8	.0	2
5.5 Leadership Skills	2.0	57.0	39.7	1.3	2
5.6 Behavioural Standards	4.7	66.4	27.5	1.3	2
6.0 Nutrition and Wellness					
6.1 Wellness Factors	.0	50.4	48.8	.8	2
6.2 Nutritional Needs	.0	52.8	46.5	.8	2
6.3 Food Safety	4.0	57.1	38.1	.8	2
6.4 Food Preparation	3.1	59.1	37.0	.8	2
6.5 Technology	6.4	64.8	28.0	.8	2
7.0 Parenting					
7.1 Responsibilities	5.9	68.4	25.0	.7	2
7.2 Practices	7.3	70.0	22.0	.7	2
7.3 Support Systems	12.0	68.0	19.3	.7	2
7.4 Readiness Factors	9.3	67.3	22.0	1.3	2

Table 4 Frequency Percentages and Median Values of Support for Increased Access

Variable	No	Somewhat Support	Support	Strongly Support	Median
1.0 Career, Community, & Family					
1.1 Roles/Responsibilities	4.7	20.2	47.3	27.9	3
1.2 Employability Skills	.8	11.7	43.0	44.5	3
1.3 Reciprocity	4.8	25.4	46.8	23.0	3
2.0 Consumer & Family Resources					
2.1 Resource Management	4.0	12.6	51.7	31.8	3
2.2 Environment	4.6	19.9	57.6	17.9	3
2.3 Consumer Rights	10.6	27.2	48.3	13.9	3
2.4 Technology	7.4	29.1	48.6	14.9	3
2.5 Consumer Action	2.6	27.8	51.0	18.5	3
2.6 Financial Literacy	2.6	14.6	48.3	34.4	3
3.0 Family					
3.1 Family Systems	4.8	19.0	44.4	31.7	3
3.2 Diversity	2.4	11.4	47.2	39.0	3
4.0 Human Development					
4.1 Principles	6.3	21.1	56.3	16.4	3
4.2 Conditions	5.5	18.8	60.2	15.6	3
4.3 Strategies	6.3	19.8	57.9	15.9	3
5.0 Interpersonal Relationships					
5.1 Functions/Expectations	1.9	16.2	47.4	34.4	3
5.2 Personal Characteristics	2.6	14.9	49.4	33.1	3
5.3 Communications	.6	9.0	41.9	48.4	3
5.4 Conflict Resolution	2.0	7.9	40.8	49.3	3
5.5 Leadership Skills	1.3	10.4	47.4	40.9	3
5.6 Behavioural Standards	5.3	13.2	41.4	40.1	3
6.0 Nutrition and Wellness					
6.1 Wellness Factors	3.9	18.9	47.2	29.9	3
6.2 Nutritional Needs	5.5	17.3	48.0	29.1	3
6.3 Food Safety	7.1	27.0	44.4	21.4	3
6.4 Food Preparation	7.9	26.2	45.2	20.6	3
6.5 Technology	8.0	33.6	40.0	18.4	3
7.0 Parenting					
7.1 Responsibilities	3.3	14.6	38.4	43.7	3
7.2 Practices	3.3	15.3	40.0	41.3	3
7.3 Support Systems	5.3	22.5	36.4	35.8	3
7.4 Readiness Factors	5.9	18.4	30.3	45.5	3

Investment in Early Childhood Care and Development: The best dividend in earlier years

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Abstract

Early Childhood Care and Development (ECCD) arose from the recognition that a young child's intellectual, emotional, spiritual and physical developments are related to health, socialization and the attainment of culture. Yet, most African countries tend to invest the least in early years only to pay heavily for ineffective remedial actions in later years. ECCD provides a structure for the required systematic investment in the early years of life. When well conceived, it entails a comprehensive set of policies, strategies and programmes intended to facilitate overall development of children from birth to 8 years of age. The paper posits that early education is highly instrumental and even necessary to improve the production capacity of a nation, and discusses the rationality behind investment in early years.

Keywords: childhood, development, investment, child care

*I am the child
The entire world waits for my coming
All the earth watches with interest to see
What I shall become.
Civilization hangs in the balance,
For what I am, the world of tomorrow will be*

*I am the child.
I have come into your world, about which I know nothing.
Why I came I know not;
How I came I know not,
I am curious; I am interested.*

*I am the child.
You hold in your hand my destiny
You determine, largely, whether I shall succeed or fail.
Give me, I pray you, those things that make for happiness.
Train me, I beg you, that I may be a Blessing to the world.*

Introduction

These lines are adopted from "The child's appeal" by Mamie Gene Cole. This is a plea from a child who wants a secure future. Caring from the very beginning can change the destiny of a child. This is what Early Childhood Care and Development (ECCD) is. The concept of ECCD integrated programming has been around for some time but the challenge is finding relevant exemplary models.

Swaziland is embarking on a journey towards implementing an “Integrated Approach to ECCD”. This is within the framework of supporting and addressing the freedom and the rights of a child’s related health, nutrition, care, psychosocial, and education needs, as well as preparing for the implementation of the ECCD Policy. All along, ECCD has been recognised through formal provisioning but now there has been a shift in ECCD provisioning. The introduction of Neighbourhood Care Points (NCPs) and Kagogo Centres are examples of family- and community-based ECCD models, which are an alternative to the existing centre-based pre-school model in Swaziland. Furthermore, the integrated approach means addressing the multiple needs of children, not only in centre-based programmes. Such approaches reflect challenges in service provision for both formal and informal ECCD provision. The integration will also address the issues of early investment as it seeks to develop strategies that will create awareness to stakeholders on the critical nature of ECCD, select the most appropriate, cost-effective ECCD models to cover the children and families in need and direct the relevant policies towards more community- and family-centred ECCD models in Swaziland. At its best it has the potential to connect diverse actors at different levels, and participation of ECCD service providers, through an integrated approach, could lead to commitment as members are joined through shared values and the quality of participation is enhanced (World Bank, 2010).

Definition

ECCD is a field of endeavour that focuses on supporting young children’s development (Boocock, 2010). Early childhood encompasses the period of human development from prenatal through the transition from home or ECCD centre into the early primary grades (prenatal - 8 years of age). Based on research, ECCD links the young child’s cognitive, social, emotional, and physical processes with the care (by families, communities, and the nation) required for supporting their development (Chaturvedi, Srivastava, Singh, & Prasad, 2010). Framed by the UN Convention on the Rights of the Child, the ECCD field is interdisciplinary in its focus. It includes health, nutrition, education, social science, economics, child protection, and social welfare. The ECCD field strives to ensure young children’s overall well-being during the early years, thereby providing the foundation for the development of adults who are healthy, socially and environmentally responsible, intellectually competent, and economically productive (United Nations, 2010).

Discussion

Children in the ECCD age group experience the most rapid period of growth and change of the human lifespan. Their maturing minds, bodies and nervous systems support increasing mobility, communication skills, intellectual capacities, socioemotional development, cultural and personal identity (Goelman & Pence, 2011). These changes result in rapid shifts in the kinds of supports young children require. Research has highlighted the particular risks to young children from malnutrition, disease, poverty, neglect, social exclusion, violence, and lack of a socially stimulating environment. Research also indicates that well-designed promotion, prevention, and intervention strategies during early childhood have the potential to impact positively on young children’s well-being and future prospects (Jaramillo & Tietjen, 2011). Therefore, ECCD seeks to ensure convergent and coordinated quality services - health, nutrition, sanitation, education, and protection - within a safe and enriched environment. All children are entitled to optimal levels of care, nutrition, nurturance, encouragement, and

opportunity. In creating appropriate systems and strategies, it is important to recognise that young children's experiences and rates of growth and development vary. They are influenced by the child's individuality, as well as gender, living conditions, family organisation, care arrangements, and the health and education systems that serve the child. To support children in their varying development, quality services are grounded in local strengths and cultural values, enhanced by a variety of proven approaches drawn from national and international research. Within the early childhood continuum from conception to age 8, each of three main age periods offers differing risks and opportunities (Kagitcibasi, Sunar, & Bekman, 2011).

Prenatal through age 3

This period is critical for ensuring survival and immediate growth and development, as well as for establishing a route for future development and growth. Research indicates that during the first three years the brain undergoes rapid and complex development, characterised by key sensitive periods, along with declining plasticity after this period. In addition, delays are increasingly difficult to reverse after age 3. It has also been demonstrated that convergent and coordinated quality services during the period of rapid brain growth can prevent an increase in developmental delays and even reverse them. To achieve optimal development, infants and young children need nurturing by at least one consistent parent or caregiver; good health care; six months of exclusive breastfeeding, if possible; balanced nutrition including essential micronutrients; early exposure to language; opportunities for playful exploration and interaction with other children and adults; and a clean, safe environment. A young child's well-being may be put at risk by adverse living conditions, neglect, insensitive or abusive treatment, and restricted opportunities for exploring and learning. Young children growing up in especially difficult circumstances, such as severe poverty, malnutrition, wars, and disease, require particular attention. Strategies must include effective involvement of parents, families, and/or primary caregivers that emphasises the quality of the adult-child interaction.

The preschool years: Ages 3-6

Children aged 3 to 6 benefit from experiences and programs that provide increased opportunities for learning through play and exploration in groups. Safe, welcoming programs can be provided within the home, through community-based activities, and within more formal preschools. To develop confident learners, early childhood programs should provide children with opportunities to interact with responsive adults; active learning methodologies; enriched curricula; and access to a variety of play, learning materials, and books. Such programs should be provided in the child's mother tongue or home language except when the setting includes a number of children whose home languages are different. Critical to the success of these programs is the strong involvement of parents and primary caregivers to help children build the skills needed to make effective transitions into varied environments and increasing activity with larger and more diverse groups of people.

Moving into primary school: Ages 6-8

Early childhood programmes, while of value in and of themselves, can also help children become ready for school and make a successful transition to school. And, while children need

to be ready for schools, it is equally important that schools be ready for children. They can do this by implementing specific strategies to support the ways that children in the lower grades of primary school learn best (e.g., through small class size, experienced teachers who have child development knowledge, active learning opportunities, use of mother tongue as the language of instruction, bilingual classes if necessary, and adequate learning materials). Parental “readiness” to be involved and supportive both before and after children enter school is also recognised as key among the supports children need for successful transition, retention, and success in school.

Benefit-to-Cost analysis

Research shows that well-targeted, high-quality early childhood interventions can yield very high economic returns. The well-known High-Scope Perry Preschool Study (Schweinhart, Barnes, Weikart, Barnett, & Epstein, 2003) included a benefit-to-cost analysis that found a return on investment of 7 to 1 (7:1). This means that for every dollar spent, there were seven dollars of savings or benefit to society. The study tracked a group of children who had participated in an ECCD programme and a carefully matched control group living in a greatly disadvantaged community in the United States. Information was collected over a 27-year period. It included information on children’s IQ (Intelligence Quotient) scores, school performance, employment and earnings, home ownership, criminal behaviour, dependency on welfare programmes, and other aspects of well-being and social behaviour. The findings revealed that: the programme children outscored the control group in reading, math, language, and total school achievement; 84% of the programme girls finished high school (versus 35% of the control girls); at age 27 the programme children were better informed on health issues, were better at problem-solving, had markedly higher earnings, were more likely to be homeowners, and had formed more stable relationships and marriages; the control group was twice as likely to be on welfare, twice as likely to have been arrested, five times more likely to have been arrested more than five times.

The benefit-to-cost analysis of 7:1 has drawn perhaps the most attention of all these findings. Calculating the monetary value of the benefits in any project analysis is complicated and involves many judgement calls, as World Bank economists van der Gaag and Tan (2008) emphasise. It is necessary to decide which outcomes of the programme should be included and how to “monetise” these. The specific circumstances of the programme need to be taken into account every time. In the High/Scope Perry Preschool study, the researchers included a range of items such as savings for the criminal justice system, as well as savings through fewer welfare payments and a lower need for special education programmes. They also calculated in the difference in earnings between the two groups and childcare benefits (what families would have spent on childcare if their children had not been in the programme).

Most benefit-to-cost analyses have not had the advantage of such a rich and reliable database and have looked at a much narrower range of benefits specifically related to children’s years in school and their projected future earnings. ECCD programme participation has a significant effect on future income because a child who attends an ECCD centre or preschool is more likely to enter into and complete primary school, to go on to secondary education, and to achieve higher performance levels than children who do not attend preschool. This better educational performance is associated subsequently with higher incomes. We have sufficient

research evidence to affirm that every year of added education improves a person's later income (Barnett & Boocock, 2008; Minujin, Vandemoortele, & Delmonica, 2002; Myers, 2004; Robert, 2002).

The economic literature on education estimates that one extra year of primary education will increase a person's future productivity by 10-30%, varying country to country. This is done by estimating a wage equation that relates differences in wages to differences in years or levels of education. The researchers then use an age-to-earnings profile to estimate the increase in productivity. Data are used that document the increases in primary enrolment, related to participation in ECCD programmes. Data are also used that document the impact of ECCD participation on the total number of classes completed in school (Bartlett, Hill, & Arnold, 2001).

The models factor in the improved retention and promotion, progression by more students to post-primary education, and sometimes even include data on the reduction in under-5 mortality, fertility rates, and other social indicators. In situations where data are not available (as is often the case) assumptions are sometimes made. For example, taking into account the costs of the education system, the "net present value" is calculated. This is an approximation of what the value of a year of education is worth monetarily. In this way society's profits from the investment are calculated and economists can then quantify the benefits of increased lifetime productivity as a result of ECCD. There are disadvantages and advantages in this approach. On the one hand, in a model that turns life factors into numbers, how can we ever know which factors really influence the growth of something as complex as children in a social context? On the other hand, we live in a world that bases much of our social decision making and spending on statistics and numbers, and so it is important for us to make sure that we understand and can explain the economic models that are used to calculate the "return on investment" in ECCD.

Van der Gaag and Tan (2008) compared the quantifiable benefits of the Bolivia ECCD programme with its costs and obtained benefit-to-cost ratios between 2.4:1 and 3.1:1. The benefit-to-cost ratios are greatest for the group with the worst social indicators (high infant mortality, high malnutrition, low school enrolment). Studies by the World Bank and other agencies in Colombia and Egypt have tended to estimate returns on ECCD programming of around 3:1 (three dollars or euros or pesos return for every one spent). The returns become as high as 5.8:1 in Egypt if programmes are targeted to children most at risk. This is because the most disadvantaged children benefit the most from ECCD. The impact in terms of reducing school dropout and repetition is much greater for children from poor families than it is powerful economic argument for investment in ECCD that is targeted to children most at risk. Economists who have undertaken these types of analyses are clear that ECCD programmes result in a large increase in the accumulation of human capital.

ECCD programmes, as an investment, compare favourably in terms of economic rate of return with investments in the so-called "hard" sectors such as road and infrastructure projects. Benefit:cost ratios for most industrial and agricultural projects, for example, are often less than 2:1. For example the Hill Forest development project in Nepal estimated a benefit-to-cost ratio of 1.18 to 1. Most of the existing benefit-to-cost analyses require some rather

strong assumptions that weaken their usefulness as advocacy tools. It will be invaluable over time to undertake similar analyses in countries where more complete data are available and fewer assumptions have to be made. Unfortunately, in the poorest countries that need programmes the most, data are still inadequate and detailed benefit-to-cost analyses are fraught with difficulties.

Despite the fact that detailed benefit-to-cost analyses are challenging, the conclusion from existing research is clear. As van der Gaag and Tan (2008) state,

Societies cannot prosper if their children suffer. ECD programs are a sound investment in the well-being of children and in the future of societies. By breaking the intergenerational cycle of deprivation, ECD programs are a powerful tool for obtaining the ultimate objective of development: to give all people a chance to live productive and fulfilling lives. (p. 33)

Swaziland does not fare so well on determinants of quality human capital development as identified in the Poverty Reduction Strategy Action Plan (PRSAP) - access to education, health, safe water, proper sanitation, proper housing, employment of freedoms, social security and contentment. For Swaziland specifically, a strong motivation for investment in integrated ECCD is that a significant proportion of children have a poor start in life. They are born into and raised in severe poverty and terrible circumstances. Their mortality rate is higher than that of their counterparts in other African middle income countries. About 40% of them do not get basic immunization, nearly 40% are stunted and 9% are underweight (see Table 1). Global experience shows that such a poor start as that for Swazi children poses a high risk to the country's human capital development efforts, and to all other efforts whose success is interdependent with well-developed human capital.

Table 1 The State of Swaziland's Children and Implications for ECCD

Africa middle income countries	Under-5 mortality rate per 1,000	Infant mortality per 1,000 live births	% 12-23 months immunized for measles	% 12-23 months immunized for DPT	% under-5s stunting	% under-5s underweight
Botswana	124	90	90	97	29	11
Cape Verde	34	25	65	72	-	-
Gabon	91	60	55	38	26	8
Mauritius	14	13	99	97	-	-
Namibia	61	45	63	74	30	20
Seychelles	13	12	99	99	-	-
South Africa	69	56	85	99	-	-
Swaziland	164	112	57	58	37	9

Source: World Bank 2010

Poverty Reduction Strategy Papers and Millennium Development Goals

In 1999, The World Bank and International Monetary Fund (IMF) launched the Poverty Reduction Strategy Papers (PRSP) framework for national poverty reduction planning. PRSPs

are prepared by governments through a participatory process involving civil society and development partners. They are intended to be:

- Country-driven—involving broad-based participation
- Results-oriented—focussed on outcomes benefitting the poor
- Comprehensive and addressing the multidimensional nature of poverty
- Partnership oriented—multi-lateral, bi-lateral, NGO
- Based on long-term perspectives.

PRSPs avoid a purely economic view of poverty: instead, they stress the need to address social and political disempowerment on the basis of gender, ethnicity, religion, and age as well. Critical work is being done on key aspects of poverty such as lack of access to health and education services. This is an important development for us as advocates for young children. For many years the social aspects of under-development were seen by some as merely a by-product of poverty rather than as part of the cause. Now that there is openness to a broader view, we need to bring home the fact that ECCD helps reduce the social and economic disparities and gender inequalities that divide societies and perpetuate poverty. Therefore, we need to find ways to participate in our National PRSP dialogues - how can we do this? We may start by using the traditional economic analyses of ECCD that have focused on the potential of ECCD programmes to enable the children themselves to break out of poverty through improved school achievement and future earnings. However, we also need to focus attention on other important impacts of ECCD, directly relevant to poverty reduction, that have yet to receive adequate attention. We need to document and convey the ways that effective ECCD programmes in the region have been particularly effective in giving parents and caregivers an increased sense of control over their lives - providing them with information and building their confidence and sense of agency to act on their own behalf and on behalf of their children. We also need to document the ways that ECCD programming, in all its diverse forms, has strengthened the abilities of families and communities to cope with difficult situations that both lead to and emerge from poverty.

ECCD has a multiplier effect that has not been adequately assessed [wording]

PRSPs are seen as the main instrument for the implementation of the Millennium Development Goals (MDGs) in the poorest countries and are usually well aligned with these. The MDGs summarise the development goals agreed on at international conferences and world summits during the 1990s. At the end of the decade, world leaders synthesised the key goals and targets into the Millennium Declaration (September 2000), which all 191 UN member states have committed to achieving by 2015. Five of the eight MDGs in the UN Millennium Declaration relate to the health, nutrition, and education of young children, as Mingat and Jaramillo (2003) point out in their assessment of what it would take to meet the ECCD related MDGs. These include:

- Halving the percentage of children who suffer from hunger
- Reducing by two-thirds the death rate for children under 5

- Cutting the maternal mortality rate by three quarters
- Ensuring all children have the chance to complete primary school
- Eliminating gender disparities in schooling opportunities.

ECCD is a first and essential step towards achieving the MDGs for the world's poorest countries. Our job is to make sure people working on the MDGs understand and embrace this. As the World Bank economists Van der Gaag and Tan (2008) state, "Providing ECD programs is a powerful way to break the intergenerational cycle of poverty" (p. 2). PRSPs are a major driving force for individual countries as they create development policies. Therefore we need to undertake analysis of these documents within the context of our own settings in order to make explicit and communicate to decision-makers the key contributions that ECCD can make. A good example of effective economic advocacy is how the Christian Children's Fund presented its ECCD model at an April 2003 World Bank-NGO consultation: ECCD was presented as a poverty-reduction programme approach. It was later included in the World Bank's World Development Report 2004 and the presentation was also shared among development agencies in Washington through Interaction, an NGO umbrella organization. Countries attempting to ensure poverty reduction in the context of all pervasive market reforms face particular challenges. Assets such as land, physical capital, information, and, most of all, education become more valuable. As Young (2002) points out, individuals who already have these assets come to the game equipped to play. But some players, all too often including the children of the poor, arrive at the game without any assets to play well. "They may not have the proper tools or even the uniform for taking the field." The conclusion is simple. The more poor families there are, and the more unequal a society is, the greater the need is for a country to channel public resources to early childhood intervention programmes in order to set effective PRSP goals and achieve MDGs.

Current situation of ECCD in Swaziland

The current situation in Swaziland reveals the following, which would have to be addressed if ECCD integration will deliver its promises: A weakening of the social and family structure as a result of HIV and Aids and other issues has led to dysfunctional homes with child-headed households, poor social/community support and lack of protection for children; There is a lack of political commitment for ECCD which directly or indirectly denies the children the freedom and the rights they deserve to grow and thrive in a conducive environment; The Ministries responsible for addressing the ECCD needs have low capacity, and limited technical, financial and logistical support to carry out a range of ECCD roles and responsibilities; There is a lack of ECCD quality assurance as there is no ECCD framework for clear ECCD service provision; The government has still not made ECCD a prerequisite for a child to enter Grade 1. There is still a lack of domestication and dissemination of international and national instruments. Now that there is the National Children's Coordination Unit, there is need to clarify its role to the stakeholders for them to know its coordination role and a clash of interests. Swaziland is economically challenged with high market prices (food), slow economic growth, high unemployment rate, and high dependency on food aid. Children in formal and informal centres have inadequate resource to fulfil all their basic needs. Other challenges include persistent drought, lack of food to feed children, poor access to water and sanitation in some centres, climate change, disasters, baby dumping,

malnutrition, pollution and school feeding. Swaziland is experiencing a breakdown of the family structures because of HIV and other issues. ECCD operates in an environment where the socio-economic status of the country has 66% living below the poverty line; 40% of children under 5 years show signs of malnutrition, and due to the prevalence of HIV and Aids, the number of orphaned children is projected to increase to 120,000 by 2010. An increasing number of children are double orphans and living in child-headed families and that means the children are growing without parental guidance (Heckman, 2010).

Why should Swaziland invest in ECCD?

The importance of the early years in the formation of a person's intelligence, personality, social behaviour, and physical development is well understood, but does this recognition lead to investment? Numerous studies have demonstrated that investments in the early years bring high returns in terms of children's educational gains, health status, and future economic productivity. This has implications at the individual, local institutional and national levels:

- At the individual level, children who get a good start do better in school, are healthier, and do better as adults in terms of their income, social adjustment, and ability to participate socially.
- At the local institutional level, such as the school, it means increased enrolment, decreased repetition and dropout, and better achievement and completion levels by children who have ECCD experiences.
- At a national level it means a better "Human Development Index," as measured by education, health (including nutrition), social development, and growth indicators (UNDP).

In other words, ECCD programming leads to a better educated, healthier populace, increased productivity and higher Gross National Product (GNP), reduced gender and class inequalities, and reduction in poverty and related effects such as violence and crime. Economic arguments, like child rights arguments, can help to frame people's understandings of why ECCD is essential to achieving both economic and humanistic goals. An investment perspective is not narrowly concerned with only the "future productivity" of the child, but also with broader social savings, such as potential savings to formal education, health and penal systems, higher earnings for parents able to enter the labour force, and higher GNPs. A better world, according to the Convention on the Rights of the Child, is one in which children have a right to survival and integral development, broadly defined to include physical, mental, social and emotional development. They should be treated equitably. They should have a right to be heard and to participate, to the extent of their capabilities (Myers, 2004).

Benefit of ECCD Programmes

International experiences shows that ECCD programmes lead to:

- Improved nutrition and health: ECCD programmes enhance the efficacy of health care and nutrition initiatives. Evidence from the Columbia Community Child Care and Nutrition Project and India's Integrated Child Development Services programme

also shows that the programmes can ensure that children receive health care (Evans, Meyeres, & Ilfeld, 2002).

- Early brain development and potential to learn: Improved health and nutrition programmes associated with well-conceived ECCD programmes enable children to be more successful in later schooling, more socially and emotionally competent, and to have higher verbal and cognitive development (Mustard, 2007).
- Improved cognitive development and school achievement: Children participating in ECCD programmes score higher in intellectual aptitude tests than nonparticipants, as was evident in evaluations of Jamaica's First Home Visiting Program and Turkey's Early Enrichment Project (Smits, Huisman, & Kruijff, 2008).
- Higher school enrolment: The Colombia Promesa programme cited significantly higher enrolment rates (in later schooling) among programme children than among nonparticipants. Moreover, various studies show that girls who were enrolled in early childhood programmes were better prepared for school and stayed in school longer.
- Better school readiness, attendance, learning, internal efficiency: studies in Colombia's and Argentina's ECCD showed that children, on average, had lower rates of repetition. In India's Dalmau programme, the only study in which attendance was measured, later school attendance was 16% higher for children ages 6 - 8. In Colombia's Promesa project, third grade enrolment rates rose by 100%, reflecting lower drop out and repetition rates. Overall, ECCD and pre-primary programmes facilitate school readiness, lead to better internal efficiency during the basic education cycle, and reduce children's chances of placement in special education and dropping out. They have a positive impact on the development trajectory of children (Arnold, Bartlett, Gowani, & Merali, 2006).
- Improved resource efficiency in the education system and the returns to society: Improvements to internal efficiency of education systems accrue better resource efficiency to the society at large. Cost-benefit analyses of early childhood development programmes have shown positive results in both developed and developing countries. The High/Scope Perry Preschool Project study in the USA estimated the returns of the programme to the public to be as high as US \$7.16 for every dollar invested (Young, 2007). Similarly the Jacob-King study in the Philippines estimated that a dollar invested in an early childhood nutrition programme in a developing country could potentially return US \$3 worth of gains in academic achievement (Schweinhart et al., 2003).
- Help for the disadvantaged and reduced social inequality: ECCD interventions in early childhood benefits the poor and disadvantaged; for example, in India's Haryana Project, dropout rates fell 46% for lower-caste and 80% for middle-caste children (Thapa et al., 2011). Similarly a study conducted in Jamaica proved that nutritional supplementation for undernourished children, who are most likely to come from disadvantaged families, improves mental development (Grantham-McGregor et al., 2007).
- Positive effect on female labour force participation and older siblings' schooling: A study in Kenya showed how women's labour force participation and older children's

schooling improved due to ECCD programmes (Antelo & Ettling, 2004). Providing safe child care also allows women a chance to continue their education, acquire new skills and join the formal labour force.

Effective ECCD programmes have been found to substantially reduce the impact of structural poverty on children's quality of life, including the improvements of their readiness to learn at later stages. Such benefits would bode well for Vision 2022 and PRSAP goals. Nobel Laureate Heckman (2010) argues that investments in children bring higher rates of return than investment in low-skill adults. In essence therefore, ensuring holistic child development is laying a solid foundation for the country's human capital and the attendant development benefits. ECCD is one of the most effective chances that Swaziland has at equitable integration of future generations into the economy and at reducing poverty and inequality in line with Vision 2022 and the PRSAP.

Policy orientation of ECCD

Despite the benefits of ECCD, its provision in Swaziland is proceeding without a policy or strategic direction required to optimise associated benefits. Prior efforts at policy formulation have remained in draft since the National Education Review Commission of (NERCOM). However, the draft policy has been at a consultation stage for nearly two years and is expected to be finalised based on the analytical underpinning provided in the report. The draft recognises diverse children's needs during their ECCD phase, as shown in Table 2.

Table 2 Perceived Needs to be Addressed by ECCD Programmes

Age	Stage	Key needs
ECD (Pre-natal to 3 years)	Pre-natal and birth	Maternal and child health; parental support; parenting education
	Infancy (0-18 months)	Health and nutrition
	Toddler and post-toddler (18-36 months)	Health and nutrition; language and social skills; thinking abilities
Pre-school	Pre-school (4-5 years)	Pre-schooling; health and nutrition; social skills; protection
Primary schooling	Lower primary school (6-8 years)	Education; health; nutrition; protection

Source: <http://www.iadb.org>

Structure and nature of ECCD Provision

Swaziland's ECCD services comprise early childhood development (ECD) for 0-3 year olds, pre-primary education for 4-5 olds, and lower primary education for 6-8 year olds. An estimated 203,000 children are of eligible age. ECD is provided by daycare centres mainly in urban areas where both parents work. Pre-primary education is offered mainly by communities, faith-based organizations (FBOs), non-governmental organizations (NGOs), and private individuals. Lower primary education is part of primary education. In addition, Swaziland has established innovative institutions that offer some elements of ECCD: NCPs and KaGogo centres (see Figure 1). These centres emerged mainly as part of the response to the impact of HIV/AIDS. KaGogo centres are modelled after the traditional KaGogo as neutral places of refuge where children can confide. They are now regarded as the coordinating centres of community

interventions, such as NCPs, and may in future serve as gateways for decentralised service delivery. Children registered at NCPs must be below 18 years of age, come to the centre regularly, and participate in activities. One or both of their parents may be either sick or dead (Marope, 2010).

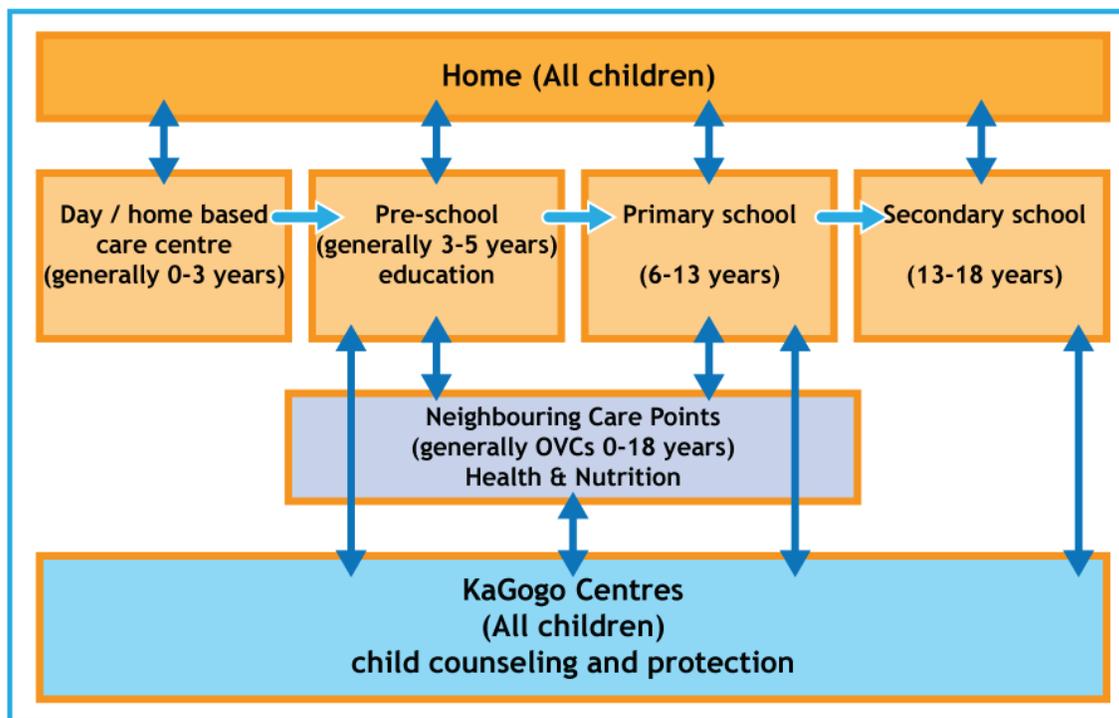


Figure 1 Institutional landscape of ECCD providers

Conclusion

There will always be something more immediate; there will never be anything more important than investment in ECCD. Most Swazi children have a hard start in life. Effective ECCD services could provide them with a gateway out of their circumstances. Poor households bear the exclusive burden of financing this subsector. Given the deep floor from which the majority of Swazi children start, ECCD services are crucial. They are crucial also to lay a foundation for sustainable and pro-poor human capital development. A pro-poor approach could be a powerful gateway for children from poor households to break the cycle of poverty. Current capacity to manage the delivery of ECCD services is weak. Overall, most of the issues in the subsector result from a near total neglect by the government of Swaziland when it comes to financing. While other subsectors require improvement, ECCD will require a re-founding. Today’s infants and young children will be the young adults of tomorrow. Therefore what is it that we need to do now, in order to ensure that today’s most vulnerable young children not only survive, but have equal opportunities to realise their potential, and fully participate in contributing to national prosperity? There is no time to waste - we must act now and invest in ECCD.

Recommendation

Comprehensive participatory research on holistic ECCD (0-8 years) in the cultural, social and economic contexts of families and communities, informing planning and budgeting processes is required in Swaziland. Awareness must be raised at all levels, that the early years (conception to age 8) are the foundation years for sustainable human resource development, and therefore, for poverty alleviation and the development of the nation. Quality integrated ECCD support services must be provided for the most vulnerable infants and young children, including those with disabilities and those affected by HIV/AIDS. Families and communities must be educated and supported in their roles as their young children's primary caregivers and first educators. It is necessary to strengthen capacity in ECCD from family to national level, and to develop clear guidelines for partnership approaches to mobilizing concrete ECD support.

Biography

Dr Hena Yasmin is a lecturer in Family Resource and Human Development Department, university of Swaziland, Swaziland since 2004. She was awarded PhD degree in 2000, India. She is involved in an academic, research and developmental task, nationally as well as internationally. She was engaged in teaching at college level from 1994 till 2000. She is active member of national and international academic and non-academic institutions. She has presented and published several papers.. She has been engaged in community works related with infants, nutrition, HIV/AIDS, rural health and income generation. E-mail: hinayasmin2002@yahoo.co.in

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