Fashion and Active Aging Symposium Proceedings

September 26-28, 2019

St. Paul, MN

Co-Chairs
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Co-Organizers: College of Design, University of Minnesota
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# TABLE OF CONTENTS

**CHOICES AFTER RETIREMENT PANEL** ................................................................. 7

**CHOICES AFTER RETIREMENT: THE MALE PERSPECTIVE PANEL** .......................... 7

Joanne B. Eicher, Regents Professor Emerita ......................................................... 7

**SESSION 1A -- DESIGN** ...................................................................................... 8

**SPORTS BRA DESIGN FOR THE ACTIVE AGING WOMAN** ................................. 8

Hali Ipaye, Kristen Morris and Pamela Norum, University of Missouri, USA ............ 8

**INDEX DEVELOPMENT TO MEASURE WOMEN'S TORSO AND THE IMPLICATIONS ON GARMENT**

**PATTERNMAKING FOR WOMEN AGED 55 AND OLDER** ....................................... 10

Nokyeon Kim, University of Delaware, USA ............................................................ 10

Elizabeth Bye, University of Minnesota, USA ......................................................... 10

**CLOTHING, A SOCIAL INCLUSION TOOL FOR WOMEN BABY BOOMERS WHO ARE DISABLED, POTENTIALLY DISABLED AND IN THE PROCESS OF AGING: THE WINTER COAT** .......................................................... 12

Ghislaine Grenon, Denyse Roy and Jacqueline Rousseau, Université de Montréal, Canada 12

**A COMPREHENSIVE DESIGN FRAMEWORK FOR THE FUNCTIONAL FOOTWEAR OF THE ELDERLY TO PROMOTE ACTIVE AGING** .......................................................... 13

Miao Tian, Ye Lei, Yunyi Wang and Jun Li*, Donghua University, China; Key Laboratory of Clothing Design & Technology, Ministry of Education, China .................. 13

**SESSION 1B -- SOCIO-CULTURAL ASPECT OF FASHION** .................................... 15

**INTERCULTURAL STUDY OF CHINESE SENIOR IMMIGRANTS’ ACTIVE AGEING IN AUSTRALIA** .......................................................... 15

Fanke Peng, University of Canberra, Australia ......................................................... 15

Na Zhao, South China Agriculture University, China ............................................. 15

**STILL ROCKING VINTAGE OVER 50: THE MEANING OF VINTAGE FOR OLDER WEARERS** .......................................................... 17

Nancy L. Fischer, Augsburg University, USA ............................................................ 17

**ANTI-STEREOTYPE: CASE STUDIES OF IMAGES OF MATURE FEMALE CELEBRITIES** .......................................................... 19

Qi Wu, Beijing Institute of Fashion Technology, China ............................................ 19

**SARTORIAL APPEARANCE MANAGEMENT STRATEGIES OF CREATIVE PROFESSIONAL WOMEN OVER AGE 50 IN THE FASHION INDUSTRY** .......................................................... 20

Anne McHinnis and Katalin Medvedev, University of Georgia, USA ....................... 20

**SESSION 2A -- WEARABLE TECHNOLOGY** .......................................................... 21

**FUNCTIONAL DEVELOPMENT OF RESIDENTIAL FIRE RETARDANT CLOTHING FOR THE ELDERLY** .......................................................... 21

Shitan Wang and Canming Liu*, Donghua University, China ................................ 21

Qingyuan He, Jiangxi Institute of Fashion Technology, China ................................. 21

Yunyi Wang, Donghua University, China; Key Laboratory of Clothing Design & Technology, Ministry of Education, China ................................................. 21

Daiwei Wu, Donghua University, China ................................................................. 21

**RESEARCH ON THE FABRIC ELECTRODES AND CIRCUITS OF ECG CLOTHING** .......................................................... 23

Yaxia Liu, Yunfeng Wang, Shuai Zhang, Linhai Chen, Jungang Zhang, Beijing Institute of Fashion Technology, China .......................................................... 23

**RESEARCH ON FEASIBLE METHODS FOR EVALUATION OF FUNCTIONAL CLOTHING FOR THE ELDERLY** .......................................................... 25

Daiwei Wu and Fei Bian, Donghua University, Shanghai, China ............................... 25

Yunyi Wang*, Donghua University, China; Key Laboratory of Clothing Design & Technology, Ministry of Education, China ................................................. 25

**DEVELOPMENT OF THERMOREGULATORY CLOTHING FOR THE ELDERLY** .......................................................... 27

Yuxi Wu and Zhaohui Wang, Donghua University, China ....................................... 27
<table>
<thead>
<tr>
<th>SESSION 2B -- CONSUMERS</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainable Wardrobe Practices of Women 55+ Living in Minnesota</strong></td>
<td>30</td>
</tr>
<tr>
<td>Marilyn DeLong, Haeun Bang and Caroline Albers, University of Minnesota, USA</td>
<td>30</td>
</tr>
<tr>
<td><strong>Fashion Behaviors of Middle-aged and Older Women in Harbin</strong></td>
<td>32</td>
</tr>
<tr>
<td>Xiang Li and Xiangyang Bian, Donghua University, China</td>
<td>32</td>
</tr>
<tr>
<td><strong>Fashion Characteristics and Innovative Design of Elderly Clothing in China</strong></td>
<td>34</td>
</tr>
<tr>
<td>Le Xu, Jiangxi Normal University, China</td>
<td>34</td>
</tr>
<tr>
<td><strong>American Female Seniors’ Responses to Mature Models in Bra Advertising</strong></td>
<td>35</td>
</tr>
<tr>
<td>Sanga Song, Indiana University East, USA</td>
<td>35</td>
</tr>
<tr>
<td>Nokyeon Kim, University of Delaware, USA</td>
<td>35</td>
</tr>
<tr>
<td>Claire Whang, California Polytechnic State University, Pomona, USA</td>
<td>35</td>
</tr>
<tr>
<td><strong>SESSION 3A -- DESIGN</strong></td>
<td>37</td>
</tr>
<tr>
<td><strong>Exploration on the Application of Chinese Silk Tapestry Craft in Clothing Design for the Ageing Population</strong></td>
<td>37</td>
</tr>
<tr>
<td>Nan Zhang and Rong Yuan, Shanghai University of Engineering Science, China</td>
<td>37</td>
</tr>
<tr>
<td><strong>Applications of Chinese Traditional Texture Pattern in Fashion Design for Mature People</strong></td>
<td>38</td>
</tr>
<tr>
<td>Yuan Wang, Shanghai Institute of Visual Arts, China</td>
<td>38</td>
</tr>
<tr>
<td><strong>The Application of an Intelligent Customization System in Making Clothing for the Middle and Old Aged Consumers</strong></td>
<td>40</td>
</tr>
<tr>
<td>Haining Zhu, Lu Xu and Rong Yuan*, Shanghai University of Engineering and Technology, China</td>
<td>40</td>
</tr>
<tr>
<td><strong>Research on the Acceptance of Ink and Wash Application in Middle-aged and Old</strong></td>
<td>41</td>
</tr>
<tr>
<td>Xiaobo Xue, Shanghai Institute of Visual Arts, China</td>
<td>41</td>
</tr>
<tr>
<td>Bo Peng, Donghua University, China</td>
<td>41</td>
</tr>
<tr>
<td><strong>SESSION 3B -- SOCIO-CULTURAL ASPECT OF FASHION</strong></td>
<td>42</td>
</tr>
<tr>
<td><strong>A Comparative Study on Aging Cultures Between China and the United States and Their Influences on Clothing Design</strong></td>
<td>42</td>
</tr>
<tr>
<td>Weiwei Hua, Yuyao Zhao, Rong Yuan and Yuqing Guo, Shanghai University of Engineering and Technology, China</td>
<td>42</td>
</tr>
<tr>
<td><strong>Fashion Interaction and Identity Construction of Older Females in Chinese Ethnic Groups</strong></td>
<td>43</td>
</tr>
<tr>
<td>Xiangyang Bian, Linzhen Li, Donghua University, China</td>
<td>43</td>
</tr>
<tr>
<td><strong>The Clothing Design of Leisure and Entertainment Styles for the Aged in Shanghai</strong></td>
<td>45</td>
</tr>
<tr>
<td>Jie Zhang, Shanghai Institute of Visual Arts, China</td>
<td>45</td>
</tr>
<tr>
<td><strong>Active Seniors: What do They Want?</strong></td>
<td>46</td>
</tr>
<tr>
<td>Haesook Kwon, Shanghai Institute of Visual Arts, China</td>
<td>46</td>
</tr>
<tr>
<td>Dongeun Choi, Sangmyung University, Korea</td>
<td>46</td>
</tr>
<tr>
<td><strong>ACTIVE AGING AND FASHION PANEL</strong></td>
<td>48</td>
</tr>
<tr>
<td><strong>Active Aging and Fashion</strong></td>
<td>48</td>
</tr>
<tr>
<td>Pamela S. Norum, University of Missouri, USA</td>
<td>48</td>
</tr>
<tr>
<td><strong>SESSION 4A -- CONSUMERS</strong></td>
<td>49</td>
</tr>
<tr>
<td><strong>Observing Universal Design in a Residential Retail Environment for Seniors</strong></td>
<td>49</td>
</tr>
<tr>
<td>Meghan Hendrickson, University of Minnesota, US</td>
<td>49</td>
</tr>
<tr>
<td><strong>Exploring Middle-aged and Old-aged Clothing Brand Market and Their Future Development Direction</strong></td>
<td>50</td>
</tr>
<tr>
<td>Youran Wu and Rong Yuan, Shanghai University of Engineering Science, China</td>
<td>50</td>
</tr>
<tr>
<td><strong>Effects of Background Color and Color Coordinated Product Displays on Consumer Satisfaction and Purchase Intention</strong></td>
<td>51</td>
</tr>
<tr>
<td>Ahmad Saquib Sina and Juanjuan Wu, University of Minnesota, USA</td>
<td>51</td>
</tr>
</tbody>
</table>
CONSUMER PERCEPTIONS OF SUSTAINABILITY: COMPARING TWO AGE GROUPS IN CHINA .............................................. 53
Xiangling Meng, Shanghai Institute of Visual Arts, China; University of Minnesota, USA ................. 53

SESSION 4B -- SOCIO-CULTURAL ASPECT OF FASHION ................................................................. 55

A LIFETIME IN THE WORKPLACE: DIVERSITY AND CHANGE IN APPEARANCE GOALS OF WORKING WOMEN IN THE TWIN CITIES, MINNESOTA ................................................................. 55
Caren S. Oberg, Marilyn DeLong and Barbara Heinemann, University of Minnesota ......................... 55

THE EFFECT OF FITNESS ON AGING: CORRELATION BETWEEN SELF-IMAGE PERCEPTION AND PHYSICAL BODY ................................................................. 57
Yuqing Guo, Keyan Liu and Weimei Hua, Shanghai University of Engineering and Technology, China ...... 57

RESEARCH ON THE PROMOTION OF THE VISUAL IMAGE OF THE ACTIVE AGING ...................................... 58
Bo Peng, Donghua University, China ........................................................................................................... 58
Xiaobo Xue, Shanghai Institute of Visual Arts, China .................................................................................. 58

ACTIVE AGING IN THE US: A GOOGLE TRENDS DATA ANALYSIS BASED ON STATES ......................... 60
Bo Ra Joo and Juanjuan Wu, University of Minnesota, USA ................................................................. 60

SESSION 5A -- DESIGN .............................................................................................................................. 62

NO PLACE LIKE HOME? SHIFTING DESIGN IDEALS FOR ELDERCARE FACILITIES ............................. 62
Claire Nicholas, Mary Alice Casto and Katie Francisco, University of Nebraska-Lincoln, USA ............... 62

THE RESEARCH ON THE APPLICATION OF COLOR PSYCHOLOGY IN THE DESIGN OF SENIOR CITIZEN MEDICAL-LIFE APARTMENT .................................................. 64
Lan Zhang, Shanghai Institute of Visual Arts, China ................................................................................... 64

A STUDY ON FUNCTIONAL PANTS DESIGN FOR OLDER PEOPLE WITH ARTHRITIS .......................... 66
Ping Xiao, Xiaokun Yu and Hua Qu, Donghua University, China ............................................................ 66

SESSION 5B -- CONSUMERS: SHOPPING ............................................................................................... 68

IN-STORE SHOPPING BEHAVIORS OF THE AGING POPULATION AND MILLENNIALS: AN OBSERVATIONAL STUDY ........................................................................................................ 68
Carmi Bobweith Omontese, Juanjuan Wu, Bo Ra Joo, University of Minnesota, USA ......................... 68

RESPONSE TO SALES PROMOTION TECHNIQUES: COMPARING THE YOUNG WITH THE AGING POPULATION ... 70
Garim Lee, Juannuan Wu, Bo Ra Joo, University of Minnesota, USA ....................................................... 70

THE EFFECT OF TYPES OF STORE AND PRODUCT CATEGORY ON TIME SPENT IN THE STORE BASED ON GENDER AND AGE DIFFERENCES .................................................. 72
Jiye You, Juanjuan Wu, Bo Ra Joo, University of Minnesota, USA ........................................................... 72

SESSION 6 -- DESIGN DISPLAY ............................................................................................................... 74

CREATIVE APPLICATION OF THE “CHINESE TUNIC SUIT” FOR THE ELDERLY CHINESE CITIZEN .......... 74
Canning Liu, Academy of Arts and Design, Tsinghua University, China .................................................. 74
Qinyi Liu, College of Fashion and Design, Donghua University, China ..................................................... 74

INNOVATIVE RESEARCH ON THE DESIGN OF MIDDLE-AGED AND OLD-AGED FOLDED CHEONGSAM ........... 79
Mengchao Zhao, Yangzhou Polytechnic College, China ........................................................................ 79
Lei Feng, Qilu University of Technology (Shandong Academy of Sciences), China ................................. 79
Xubing Xu*, Donghua University, China .................................................................................. 79

WANDER WITH THE CLOUDS: DESIGN SERIES FOR MIDDLE-AGED AND OLDER MEN ................................ 80
Nan Zhang, Youran Wu, Rong Yuan, Shanghai University of Engineering Science, China ...................... 80

FORWARD, A MINI-COLLECTION FOR WOMEN AGED 50+ .................................................................... 82
Caroline Albers, University of Minnesota, USA ....................................................................................... 82
Choices after Retirement Panel

Choices after Retirement: The Male Perspective Panel

Joanne B. Eicher, Regents Professor Emerita

Keywords: Retirement, Male perspective, Fashion

The following four panelists will respond to questions about active aging, concerning their lives before and after retirement, including cultural expectations for their professions and their views on activities related to health and wellness, including exercise, mental health, diet, dress, and how they give service to their community.

Mingxin Bao-Professor, Donghua University, Shanghai, China

Donald Clay Johnson- Librarian, Ames Library of South Asia, University of Minnesota

Max DeLong- Nuclear Engineer, Xcel Energy, Minneapolis, MN

James House- Professor, Orthopedic Surgery, University of Minnesota
Session 1A -- Design

Sports Bra Design for the Active Aging Woman
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Keywords: Baby boomer, Active aging, Activewear, Sports bra

The activewear industry is an important and influential market in the apparel industry with growth projected at 8.0-8.5% in 2016—the highest percentage growth rate of any apparel sector (Amed et al. 2017). This mega-market is obsessed with youth, and senior women are hidden, or underrepresented, in the activewear market (McCann 2016). Women who wish to continue to exercise later in life purchase and wear activewear that is optimized for young people. As the National Council on Aging has noted, exercising regularly is one of the main ways to remain healthy into old age. However, there is a void in the activewear market for apparel catered specifically to older adults – or the active aging (McCann 2016). As the body ages, normal physiological changes occur such as changes in posture, height, weight, fat distribution, muscular strength, body stiffness, and coordination (LaBat 2007; Rosenblad-Wallin 1985). In addition, breasts of post-menopausal women become softer as the glandular tissue is replaced by fat and hang lower as the ligaments inside the breast stretch (Gefen and Dilmoney 2007). Thus, activewear currently available in the market may not fit, or provide adequate support, especially for the breasts, for an older body. Therefore, the purpose of this research was to explore the apparel needs of women 55 years and older, specifically, for sports bra attributes. This study is framed by Rosenblad-Wallin’s (1985) user-oriented product development model. Rosenblad-Wallin posited that the utility of a product could be determined by considering both the product’s symbolic and functional values. Functional values of products are created in a relationship between a person, the product, and the physical environment (e.g., protection/security/survival, comfort, fit, etc.). The symbolic values, also described as the non-material values, present as a relationship between a person, the product, and the socio-cultural environment (e.g., self-esteem, state of mind, group membership, decoration, fashion, and respectability). Although mainly a functional product, sports bras still embody symbolic meaning for the wearer. Product success is predicated on how well social symbolic messages and functional use-values are considered in the product design.

Methods
This research is descriptive in nature, utilizing qualitative data from 14 semi-structured interviews with active women age 55 and older. The researchers purposively selected the sample through a snowball sampling method (Tashakkori and Teddlie 2010). These methods ensured a homogenous group of participants that could speak to shared experiences (Tashakkori and Teddlie 2010). The interviewees were from three locations in the Midwest, and one location in the Western United States. Participants ranged in age from 55 to 78 and are women with diverse occupations from retirees, to nurses, to professors. Participants were active at least three times a week; they participated in activities ranging from running to group workout classes. Data were collected through in-person, telephone, and Skype interviews that followed an IRB approved semi-structured interview guide. Each interview was audio recorded and transcribed verbatim. The interviews lasted between 27 to 60 minutes. The researchers analyzed the data
using theme analysis and progressed in two stages, open coding using a-priori codes (e.g., functional, symbolic, cost), followed by selective or more specific coding which included coding for the final themes listed in this analysis. Throughout the coding process, the researchers also open-coded for themes that emerged which were not included in the initial codebook.

Results
The product attributes revealed in this study are organized into functional and symbolic value categories. As a result of data analysis, three central themes emerged. The first theme of layering for support combined functional and symbolic values. These attributes were concerned with fit, ease of movement, and respectability. The first theme illustrated that women layered sports bras with other bras (sports and non-sports bras) as well as apparel to achieve their needed level of support. The second theme, modesty, was aided by the layering of clothing to help the women achieve their desired level of chest modesty during their physical activities. This theme of modesty again combined functional and symbolic values and was also concerned with ease of movement and respectability. A majority of the women disliked how low cut their sports bras were and desired more coverage. The third theme was ease of donning and doffing. This theme centered around the functional and symbolic values of fit, pressure on the body, and self-esteem. The majority of women felt that their sports bra was hard to put on and take off due to the location of the closure and mobility difficulties due to aging.

Conclusion
The results of this research may be used by activewear manufacturers to increase the use value of sports bras for women over 55, principally by applying the identified functional and symbolic properties. Future work will explore these factors for design by creating prototypes and testing the prototypes with women in this often-overlooked market.

References


Index Development to Measure Women’s Torso and the Implications on Garment Patternmaking for Women Aged 55 and Older

Nokyeon Kim, University of Delaware, USA
Elizabeth Bye, University of Minnesota, USA

Keywords: Aging body, Posture, Torso indices, Pattern

People use garments to improve their appearance, project their self-image, and create positive impressions to others (Kang, Sklar, and Johnson, 2011). Therefore, garments may direct the wearer’s body image and perspectives of aging. Birtwistle and Tsim (2005) defined the term ‘cognitively young’ for those who feel younger than their chronological age and articulated that this chronological-cognitive age gap affected clothing selection among mature women. Apart from these psychological aspects, people experience physical changes with age. Although variations in fabric choices, styles, and design attributes may camouflage the aging body, they do not deal with the fundamental challenges. Garments which support posture variations and desired fit in aesthetically pleasing and physiologically comfortable ways may significantly enhance mature women’s self-image. This study developed indices to measure women’s torso and suggests implications on garment pattern development.

Body scans of 165 women aged 55 and older were analyzed and included baby boomers who reached an age between 55 and 72 years in 2019. Despite distinct design preferences and knowledge about garment fit, baby boomers have expressed dissatisfaction with the lack of proper fit in the current market (Howarton and Lee, 2010). Among common physical changes with advanced age, spinal curvature shows a universal and progressive change (Boyle, Milne, and Singer, 2002) resulting in an overall postural shift in the torso along its alternate curves. Therefore, the body scans were analyzed from the right side of the lateral body in which spinal curvature and its consequences were investigated most effectively.

A total of 21 indices representing eight torso regions of back, neck, shoulder, armhole, bust, waist, abdomen, and hip were developed using 4 reference lines, 20 landmarks, and 34 linear measurements. Two criteria for index development of each torso segment were variations to the sagittal plane representing either anteroposterior inclination or relative body depth and variations to the transverse plane representing relative height of the body. Independency of each criterion within a body part were verified and respective index values provided in-depth dimensional information for pattern development. Different proportions of back curvature with the upper back curvier than the back as a whole suggested more sophisticated garment shaping in a bodice pattern. The subjects’ forward tilt in the armhole required a flatter upper armhole shape in the front and a more rounded upper armhole shape in the back. While common patternmaking for upper garments set shaping devices based on the bust point, the bust was not the most prominent point on the front body as seen from the side. Findings suggest that garments to accommodate the aging body require comprehensive understanding of body measurements, spatial configurations between the body parts, and balance in the torso. Best practices in patternmaking should start with an assumption of the wearer’s posture for desired garment fit, thus the results of this study will provide significant implications for garment design for women aged 55 and older. While this study presented
theoretical and conceptual considerations, future pattern development based on the findings and wear tests will empirically corroborate the implications of the index development.

References
Clothing, a Social Inclusion Tool for Women Baby Boomers Who are Disabled, Potentially Disabled and in the Process of Aging: The Winter Coat

Ghislaine Grenon, Denyse Roy and Jacqueline Rousseau, Université de Montréal, Canada

Keywords: Clothing, Female Baby boomers, Handicap, Inclusive Design

This cross-sector study in clothing design and occupational therapy targets women of the baby boomer generation with disabilities, eventual disabilities and in the process of ageing. Often these women tend to isolate themselves because, for example, their coats are simply inadequate in winter. Supported by principles of universal and inclusive design, this study helps identify how the concepts of HEDONISM, COMFORT, and FUNCTIONALITY are expressed and articulated, and which insights could inform the design of a winter coat from an Aging in place perspective. The on-going relationship between body and clothes allows to analyze the ageing process, both on the physiological and cultural realms.

This thesis proposes the study of how these phenomena affect ageing women. Julia Twigg’s work is an essential point of reference here. In order to deduce the parameters of design, a qualitative research includes interviews with four women, direct observations, as well as individual fittings of their own winter coats. The results then made it possible to identify and confirm the predominance of HEDONISM over the other two concepts (COMFORT and FUNCTIONALITY). Moreover, a body of information that is not classifiable under HEDONISM, COMFORT AND FUNCTIONALITY was distinguished by its temporal notions. It brought forth a new concept, and this concept is TEMPORALITY (the progression of ideas and perceptions linked to clothing and women undergoing with disabilities, eventual disabilities, and in the process of ageing). Time acts like an umbrella under which we find the three main concepts mentioned above. Criteria for designs are thus revealed. For one point, affordability promotes social inclusion. Accessories are unavoidable considerations when modeling attire. Sportswear technology is of primary importance for HEDONISM, COMFORT and FUNCTIONALITY clothing, as is versatility. The creation of specs sets for an interdisciplinary design of an eloquent coat suitable for harsh winters is the goal of this study. These winter coats should be pleasing to the contemporary tastes of women of the baby boomer generation. In conclusion, this systemic approach to clothing design for the baby boomer woman offers a new way to address old age.
A Comprehensive Design Framework for the Functional Footwear of the Elderly to Promote Active Aging

Miao Tian, Ye Lei, Yunyi Wang and Jun Li*, Donghua University, China; Key Laboratory of Clothing Design & Technology, Ministry of Education, China

Keywords: Functional footwear, Elderly, Demand analysis, Empathic design

With an aging population, health problems become a growing concern. As of 2025, the population of China over 60 years old is expected to reach 300 million, leading China to a super-aging country. Researchers consider outdoor falls a relatively neglected public health problem since they represent almost 50% of total falls (Li et al. 2006, 1197). The footwear are the particular contact medium between human feet and ground surface (Menant et al. 2008, 1169). Well-designed functional footwear are capable of reducing the health hazards in various environments (Gates et al. 2012, 40) and promoting active aging.

A comprehensive design framework for the functional footwear is proposed in this study; including three stages of demand analysis, design process and product evaluation (Figure 1). Firstly, a targeted survey is supposed to be performed centered on the elderly users, footwear characteristics and application environments. According to the survey, core demand elements could be extracted from the functional and aesthetic aspects of the footwear, to meet the differentiated needs of the elderly group in a variety of climatic conditions and usage scenarios.

There are cognitive differences for the designers and users on the footwear function and aesthetics. It is of great importance for footwear designers to understand the requirements of the elderly users, and for the users to convey their feeling of colors, styles and materials to the designers. Therefore, the second stage of the design framework was to establish a dual feedback mechanism to give full play to the role of the footwear designers and the elderly users during the design process. On one hand, an experience platform for the footwear designers is developed based on the concept of empathy. Through the experience platform and the old-age action simulation experience suit designed according to the physiological changes of the elderly (Lavallière et al. 2017, 183), the designers could experience the feeling of aging. Combined with the simulated usage scenarios, the designers could experience the aging state in depth. On the other hand, a cognitive behavioral platform for the elderly users is developed based on the visual elements of the footwear, such as colors, stylist and materials. According to the perceived perception experiments for the elderly users, the design concept and functional intent of the footwear could be well conveyed to the consumers through visual design elements.

The subjective feelings of the designers and users play an important role during the design process. However, the performance evaluation is also critical for the functional products before they reach market. Hence, the third stage of the design framework was to conduct objective evaluation of the footwear with professional apparatuses. The 3D foot scanner, 3D motion capture, planter pressure sensors, for instance, could be applied to assess the elderly static balance and dynamic stability when wearing the shoes, and guarantee the functional performance is up to standard.

A method of footwear design for people 60 years and older is proposed in the present study with a main purpose of developing functional footwear for the elderly, to accommodate various climatic
conditions and usage scenarios. The users’ requirements are classified according to the physiological function level of the elderly as well as usage scenarios. The design process is user-centered and demand-oriented, and the empathy concept is infiltrated all aspects of design. Scientific evaluation approaches assist in the evaluation as well. Both of physical and mental health are expected to be improved, to promote active aging for the elderly population.

Figure 1 A comprehensive design framework for the functional footwear of the elderly persons

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Session 1B -- Socio-Cultural Aspect of Fashion

Intercultural Study of Chinese Senior Immigrants’ Active Ageing in Australia

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Keywords: Chinese immigrants, Active ageing, Cross-cultural study, Baby boomer immigrants, Australia

Australia is a multi-cultural and multiracial country. One in four Australians were born overseas. 46% have at least one parent who was born abroad, and nearly 20% of Australians speak a language other than English at home. The 2016 Census found that Australia is home to more than 1.2 million people of Chinese ancestry. Of these, two in five (41%) were born in China. Four out of five people of Chinese descent (82%) did not state another ancestry (ABS 2017). Australia's immigrant community is ageing along with the rest of the population, and in many cases, with significant cultural and language barriers.

The current study on ageing is mainly focused on the baby boomers born between 1946 and 1964 in Australia. Older immigrants are often ignored. This paper is focused on the Chinese immigrants in Australia who are baby boomers. This study aims to find the challenges they are facing while identifying good practices that some of them have been practised for maintaining an active lifestyle after moving to Australia. The research team worked closely with four Chinese seniors’ associations (two in West Australia and two in Australia Capital Territory) for the primary study. During a period of 12 months, the research team interviewed the group leaders and participants who attend the regular activities, such as English study, dancing, and Fashion show organised by the associations. The participating groups also provided the responsibilities and accountability of the participants.

The first diamond steps (discover and define) in the Double-Diamond framework (The British Design Council 2018) were applied in this study. Focus group, interview and storytelling were adopted for in-depth conversations and analysis. The study helped to identify the benefits of the activities on their active ageing. It also provided the opportunity to understand the changes the senior immigrants have made after they join the regular group activities, including their communication habits, their access to local information, and their fashion needs and consumptions.

This study of active ageing has the potential to find solutions for better support of senior immigrants’ living in Australia. The findings also have the potential to influence the policy-making for better ageing in the multicultural communities. The findings will be reported back to the local city council and the Australia multicultural sector to help develop new strategies and infrastructure to enable baby boomers to better integrate into their new environment and participate in active ageing in a multicultural environment.

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Still Rocking Vintage Over 50: The Meaning of Vintage for Older Wearers

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Keywords: Women, Fashion and aging, Vintage clothing

In an essay based on her book *The Middlepause: On Turning 50* author Marina Benjamin (2016) laments the bodily changes of menopause – weight gain, sagging skin, floppy arms, the feeling that “I am past ripe, like those blowsy summer blossoms on the turn.” Older women are often expected to be invisible in Western culture, no longer symbols of beauty nor active child-rearers. They are under-represented in the media and taught to participate in their own erasure: to dye their hair, use anti-aging creams and otherwise do anything they can to avoid the “failure” of having grown old (Applewhite 2017). While older women were once expected to demonstrate a sophisticated and elegant sense of fashion in comparison to their younger peers, the 1960s “youthquake” seemingly entangled fashion itself with youthfulness (Przybyszewski 2016). The fashion industry primarily pitches its wares to the young, largely dismissing the challenge of designing for normal bodily changes associated with menopause (Townsend, Sissons, and Sadkowska 2017). Pamela Church Gibson (2000) describes how shop clerks treated her differently as she aged, either not noticing her or believing that she had come into the store to shop for her daughter. According to Julia Twigg (2013, 1), “[A]ge is not just peripheral to fashion but positively erosive of it.” She describes how older women are expected to cover their bodies, show little skin, and disguise figure “flaws” associated with aging.

A key reason why women dress in vintage clothing is because it is unique and it allows the wearer to stand out from the crowd (Delong et. al. 2005). If women over the age of 50 are culturally expected to fade from fashionable view, one might expect that wearing vintage – a dress practice that attracts attention – might also fade with age. However, women who began wearing vintage clothing earlier in life continue to do so as they age (Jenss 2017). Moreover, older women also use vintage as an eye-catching form of streetstyle (see Cohen 2012) and they are likely to have held onto classic garments that have now become “vintage” (Delong et. al. 2017).

What does vintage mean to the woman over 50? As part of a larger project, I surveyed over 200 vintage clothing wearers, 28 of whom were 50 to 77 years of age. I compare their responses with 32 respondents who were 35 and under (age range 17 to 35). Are there differences in why older and younger women wear vintage clothing, or what draws them to it and what older clothes mean to them? I found that both younger and older women were attracted to vintage clothing for similar reasons of seeking unique clothing that is affordable, of high quality, that fits well. However, older women are more likely to find meaning in vintage clothing that reflects the sense of history embedded in the garments, whether personal (in terms of clothing once worn by family members) or abstract (imagined previous owners or workers who made the clothing). Younger respondents were more likely to not associate any particular meaning to the age of the vintage garment. For older women in particular, wearing vintage is, among other things, a means of “stitching time,” (Sarial-Abi et. al., 2017) of finding continuity between past, present and future. The meaning this provides may help older women cultivate their own sense of happiness (Pipher 2019) and resist the culture’s overall message that they should remain invisible.
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Anti-Stereotype: Case Studies of Images of Mature Female Celebrities

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Keywords: Age stereotype, Mature women, Celebrity, Image

There have been a lot of studies and discussions on age stereotype, among which psychological research that used quantitative and experimental methods accounted for a large proportion. This paper tries to explore the age stereotype from another perspective, using a range of qualitative research methods: personal growth review, text analysis, and semiotic analysis of images. It began with the discussion of the pop-culture icon Ruth Bader Ginsburg. An Internet meme took the form of her image, which appeared on t-shirts and coffee mugs and inspired tattoos, nail art, Halloween costumes etc. This paper considers that compared with her professional status and gender, the age factor which had been relatively undervalued, played an important role in her popularity. The image also showed its power in her popularity.

This paper reviews more hot topics related to mature women celebrities and analyzes their images. Based on those case studies, this paper puts forward that the controversial images maybe one of the ways that older women can be seen and heard. The anti-stereotype images brought contrast which created sufficient drama to attract the public attention and make it more easily spread online. Meanwhile, the mature women celebrities also use their power to reduce the age prejudice and bring more possibilities for older people.

For further discussion, this paper turns back to Ruth Bader Ginsburg. Since she was nominated as an Associate Justice of the Supreme Court by President Bill Clinton at the age of sixty, Ginsburg became a good case for anti-age discrimination. As to her image, Ginsburg deviates from court tradition by wearing a French robe just after her appointment to the Supreme Court in 1993. And she began to wear various jabots, necklaces and other forms of neckwear in later years which made her signature style. She successfully demonstrated that elderly people are wise to use appearance to express themselves and create identity.

In conclusion, anti-stereotype is a kind of life wisdom and communication strategy for elders. The biological age is just a number, which can be totally different from one’s psychological age. Similarly, one’s appearance may not reflect his or her biological age. The diversity in mature celebrities’ images helps to steer the society towards greater tolerance and better understanding for older people and create a positive environment for active aging. And thus, active aging is not agelessness, but means one does not need to be confined by age: free style, free life.
Sartorial Appearance Management Strategies of Creative Professional Women over Age 50 in the Fashion Industry

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Keywords: Appearance management, Baby boomer, Gendered ageism, Fashion industry

Women in the United States are often subjected to unrealistic standards of ideal appearance. These ideals are even more extreme in the fashion and beauty industries for obvious reasons. Because creative professional women are in the business of creating style and beauty, there is a high level of expectation towards them to maintain their dress and appearance at a not explicitly stated, but anticipated and often unrealistic standard.

In this study creative positions in the fashion industry refer to design, trend forecasting, product development and merchandising related jobs. Older women working in these areas are in a double bind because when one is responsible for creating fashion-forward products, the perceptions of one’s appearance become part of their professional expectations; it is supposed to reflect one’s aesthetic values and creativity. They need to use fashion and dress as a form of personal expression that reflects their own personal and business branding while maintaining a professional appearance. They have to present themselves in a manner that is in sync with the products they create, i.e. beautiful, youthful, and fashion-forward.

Women have longer life expectancy these days than ever before. Because of this, female baby boomers tend to delay retirement. However, this raises the question: are older women who work in the youth-focused fashion industry too old to be young or too young to be old? By examining the perspectives of 12 women, from ages 50 to 75, currently holding creative positions in the NYC fashion industry, the research explores the complexity of personal beauty, age and dress for this professional cohort in today’s visual culture of youthful beauty that pervades the fashion industry.

This qualitative study investigates the lived experiences of these 12 professional women to assess the micro-practices and coping mechanisms they exhibit in order to continue to be seen and heard in their profession. Primary data was collected using semi-structured interviews. Open-ended questions in the interview protocol were designed to prompt participants to reflect on their experiences in the fashion industry in as much detail as possible. The results of the study reveal how the interview participants’ sartorial practices and head-to-toe appearance management strategies have evolved after working 25 or more years in the industry. They also provide crucial insights about the complexity of aging in a youth-centric, visual culture.

By examining the relationship between women’s personal style and the industry’s expectations of their workplace appearance, the study addresses social and cultural views on fashion as it relates to the aging body, fitness and self-image. In addition, it documents the wardrobe solutions and fashion consumption and needs of this population. The study fills in a gap in research on gendered ageism and appearance management strategies of women over 50, which currently is under researched in academia.
Session 2A -- Wearable Technology

Functional Development of Residential Fire Retardant Clothing for the Elderly

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Keywords: Fire retardant clothing, Functional design, Elderly people, Dressing convenience

Currently, the number of elderly people in China is increasing rapidly, with a large proportion of them living alone (Xu 2002). The elderly are at high risk from household fire injuries and deaths due to their impaired physical and cognitive functions. It is reported that in 2018 (Bureau of Fire Suppression and Rescue 2018), over 60% of all household fires occurred in elderly people’s houses, contributing to almost 30% of all fire-related injuries and deaths. Although commercial products aiding evacuation from fires, such as fire extinguishers, escape ropes and ladders, are important in reducing fire injuries, they are difficult to be operated and maintained for the elderly (Diekman, Huitric, and Linda 2010). Moreover, these evacuation aids could not directly block fires when users are exposed to flash fires. The aging population, coupled with a high proportion of fire fatalities, suggests that it is necessary to develop an appropriate fire evacuation aid for the elderly. Textile products with fire retardant properties that could cover the human body to provide direct hazards protection and are easy to use and store, may be a practical option for elderly people.

Based on a survey about the limitations of commercial fire-retardant blanket (low body surface coverage and occupation of hands) (Hua, He, and Wang 2016), the new design concept of ‘clothed style’ was put forward in this study. The design specifications, including body coverage, dressing convenience and body mobility, were first identified and then detailed design approaches were optimally balanced by an interaction matrix. The design approaches include: 1) a multi-layered fabric system with all the fabrics and accessories, like velcro, reflective strip and sewing thread, being flame resistant; 2) a robe with a fully opened bottom hem as the basic style; 3) kimono sleeves facilitating arm access and widening the range of the arm motion and sleeves tilted down 15 degrees to avoid bulky underarm; 4) reflective strips attached at the hood, center front placket, sleeve cuffs and bottom hem to enhance visibility. Furthermore, some specific details were developed to meet elderly people’s demands, including: 1) based on a pilot test, the front opening was designed as an adjustable two-separated structure which combined a straight opening on the left sleeve with a straight opening from the bottom hem to the left shoulder. This opening was much easier for arm access and could be fastened more quickly, either by the wearer him/herself or by the assistant; 2) a curved bottom hem was designed at the back bodice so that the center back was longer than the front to ensure the body coverage, which addresses the crookback commonly occurring on the elderly (Demura, Kitabayashi, and Aoki 2008).

The fire-retardant clothing for the elderly characterized by greater body surface coverage and easy use was newly developed in this study. The findings of this study are expected to reduce the...
fire injuries among the elderly, especially those living alone, as well as contributing a new inspiration and concept to creative development of residential fire-retardant products. This new fire-retardant clothing has the potential to be widely accepted and serve universally after verifying its thermal protective level and ergonomic capacity.

References

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Research on the Fabric Electrodes and Circuits of ECG Clothing

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Keywords: ECG monitoring, Wearable, Fabric electrode

In recent years, many medical devices have become wearable. These wearable monitoring devices enable long-term monitoring of human bio signals and transmission to terminal devices to detect the possibility of sudden illness in the elderly as early as possible. Using the Arduino board and the ECG detection sensor, the fabric electrode can be used to replace the traditional wet electrode to collect the ECG signal and obtain similar performance ECG signal. In order to obtain the best test position of the ECG electrode, we design the test points according to the 12-lead system and the EASI system as shown in Figure 1. The optimal electrode positions of the ECG electrodes are A3B3D4 and A7B7D4. According to the characteristics of human motion, the A3_A7, B3-B7 and D4 positions are made into a long ECG electrode structure of 2cm*6cm as shown in Fig. 2. Connected by the ADS1293 and NRF51822, a flexible ECG monitoring system with foldable features for accurate ECG signals.

In order to improve the performance of the electrode, the fabric electrode is designed as a W-shaped road, and the circuit shown in Fig. 3(a) is added between the electrode and the control board, and a fixed button is added on the test garment to reduce the relative movement of the electrode and the human body as shown in Fig. 3(b), This ECG detection clothing is more suitable for the detection of human ECG in daily activity.
FIG 3 The test point of the ECG position
Research on Feasible Methods for Evaluation of Functional Clothing for the Elderly

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Keywords: Functional clothing, Evaluation method, Restricted mobility, Elderly

According to a technical report of U.S. Census Bureau, by 2050, there will be 1.6 billion aged 65 and older people worldwide, representing 16.7 percent of the total world population (He, Goodkind and Kowal 2016). Nowadays, as the world population is aging rapidly, "Active Aging" has become the core concept in the field of research and development of products for the elderly. Clothing and accessories are closely related to the quality of activities in the daily life of elderly people, especially for elderly people with restricted mobility. In many cases, the quality of life for the elderly with restricted mobility can be substantially improved by a better choice of functional clothing (Meinander and Varheenmaa 2002). At present, a series of functional and smart clothing products has been developed for this special group. Researchers and product designers mainly focus on the application of new fabrics, new structures and smart wearable devices in clothing products innovation. However, the methods of functional effectiveness evaluation of these products, most of which are qualitative, subjective and lack of reliability, are still commonly used. Therefore, quantitative, objective and reliable evaluation indicators and methods accepted by the industry are required. Based on consideration of specific needs and restrictions of this group that are different from those of normal people, an evaluation system diagram of functional clothing was drawn in this article for the elderly with restricted mobility. In the diagram, those clothing products for evaluation analysis are designed for requirements of actively participating in activities of daily living (ADL) (Mlinac and Feng 2016). Objective test indicators were extracted and summarized in both performances of ergonomics and comfort, including: (1) ergonomic performances (e.g. easy for donning and doffing clothing, flexibility of ADL) (Wang, et al. 2014); (2) comfort performances (e.g. warmth, comfortable to touch) (Neves et al. 2015). Then, these test indicators were discussed and classified. In addition, there are some other performances that can help this special group reduce risk of accidents, such as application of fire-retardant fabric for fire escape, adding smart wearable devices to prevent getting lost. By applying the extracted indicators and methods in fabric test, manikin test and human experiment, we could obtain a quantitative evaluation of these performances above.

In this paper, we analyzed existing problems in the field of clothing evaluation for the elderly with restricted mobility, discussed the feasibility of establishing an evaluation system of functional clothing products for the elderly, and provided effective advices for complement and improvement of product development. This will be of great significance for the practice and implementation of the concept of "Active Aging" in the future.

References


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Development of Thermoregulatory Clothing for the Elderly

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Keywords: Elderly, Smart clothing, Thermoregulation, Cold sensitivity

As people grow older, the ability of the temperature regulation is gradually declining. The older people are always more vulnerable to thermal-related discomfort in cold (Ma, Xiong, and Lian 2017). At present, wearable devices has been used in field of thermal comfort (Gao, Kuklane, and Holmér 2010). The objective of this paper is to develop a smart clothing for the elder, which can automatically adjust its underwear microclimate according to the different environment.

The paper includes three parts:

1) The skin temperature and thermal sensitivity testing
As the thermal sensitivity of older women are more sensitive than the men, 8 old women aged 61 to 68 were selected (wt.: 57±5.6 kg; ht.: 155 ± 4 cm; body fat: 25.1 ± 3.5%; body mass index: 25.8 ± 3.4 kg/m2). The experiment clothes with detachable fabric (Length and width:20×20 cm) was made in the participants’ body size(Li, Zhang, and Wang 2002, Li, Wang, and Zhang 2002). The experiments were carried out in climatic chambers at 20±1℃ with 70 minutes totally. In the first 30-minutes preparation period, the subject was pasted with 14 thermister sensors and adapted to artificial environment. Next, removing one section of detachable fabric from clothes and exposing body skin about 20 minutes. The questionnaires about thermal comfort sensation was distributed in every 5 minutes in this period. The exposing sections contained chest, waist, back, abdomen, arm and lower limb. Finally, restoring the detachable fabric for 20 minutes(Su et al. 2018).

2) The optimum heating temperature
According to the result of elderly skin temperature variance and the thermal sensitivity, several groups of heating zones are divided on thermal-manikin body firstly. The thermal-manikin will be placed in the experimental environment of 0℃ ~ 20℃ (humidity: 50±10%; wind speed: 0.1 m/s), wearing in adequate clothes as the elder usually do in the cooler climate. The clothes are sewed with Carbon heating fabrics, and the heating efficiency, uniformity, duration and etc are testing with the different heating temperatures. Finally, adopting entropy weight and synthesis evaluation method to establish the elderly thermoregulation model, and getting the result of the optimum heating temperature. The optimum heating temperature set for different body sections are the sensible specifications that suggested to be achieved in order to provide medical comfort for older people.

3) The smart thermoregulation system
The light and flexible suit with smart thermoregulation system consists of four parts: the heating element, temperature sensors, power supply unit and temperature controller (Wang, Yang, and Dong 2017). The wearable systems can heat up intelligently and acquire the microclimate temperature of underclothing in real time. In order to determine the needed warming power so that the thermal sensation of the elder wearing the smart clothing remains optimal in various conditions, a Fuzzy-PID control model is proposed(Jussila et al. 2018). When the skin surface temperature is lower than the target temperature, the power switch of electric heating is
controlled by output of PWM signal through Fuzzy-PID algorithm, so that the electric heating element is driven to work. The target temperature set in PID model is the optimum heating temperature form Part 2. Figure 1 show the preliminary design of this smart clothes.

Fig. 1 Thermoregulatory Clothing for the Elderly.
(1 Detachable garment lining; 2 Carbon heating fabric; 3 Temperature sensors; 4 Lithium cell; 5 Temperature Controller; 6 Circuit pipeline; 7 Flexible Solar Cells.)

The result of this paper is developing a wearable electric heating clothing with an intelligent and comfortable heating for the elder in cold. In terms of the experimental temperature and the participant of the study, the electric heating clothing is more suitable for the senior aged 60~70 in Monsoon Humid Climate Zone. In later study, the thermoregulation system will be further improved by the assessment of human wearing. Whether it is suitable for the elderly more than 70-year-olds, needs additional experimental verification.

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Session 2B -- Consumers

Sustainable Wardrobe Practices of Women 55+ living in Minnesota

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Keywords: Older fashion consumers, Wardrobe solutions, Apparel needs, Sustainable practices

According to the U.S. Census Bureau, the median age of the U.S. population rose from 35.3 years on April 1, 2000, to 37.9 years on July 1, 2016. Peter Borsella, a demographer in the Population Division, said, “The baby-boom generation is largely responsible for this trend. Baby boomers began turning 65 in 2011 and will continue to do so for many years to come.”[1]

As the average life expectancy has increased significantly, this older population has a growing presence in society and culture in the U.S. It means they are influential consumers and users who can exert their influence on the market and industry. Although not considered as mainstream fashion consumers today, this population have contributed significantly to development of the fashion industry and have been at the leading edge of trendsetting for many years. These women are still establishing themselves as active and innovative fashion consumers.

As a part of the normal aging process, many of these women have already retired and experienced physical, social, economic and psychological changes. These changes might require a changing lifestyle—i.e. moving into a smaller space, reducing their wardrobe. However, it does not mean that they have become laggards in the adoption of innovation. They continue an active lifestyle and pay attention to improving their quality of health, well-being, and social activity.

The purpose of this study is to examine these women’s active lifestyles, apparel needs and wardrobe solutions. Research on apparel sustainability suggests that the older consumers’ experiences with their wardrobe could be key in examining sustainable best practices.

The survey was distributed using a snowball sampling method. The survey participants were females 55+ years of age who have lived in the Minnesota for at least 10 years. These women continue to have an interest in their appearance and pursue an active lifestyle. Through the survey, demographic information including age, education level, employment status, as well as the level of activity, appearance and lifestyle, clothing consumption patterns, and wardrobe strategies were collected. Among the survey participants, a certain number of individuals who volunteered to be selected for in-depth interviews provided personal stories and opinions related to active aging and apparel sustainability. Data were collected, coded and organized for analysis. A narrative analysis method was used for reporting.

Attention to both the individual stories and collective behavior begins to create a model for understanding the needs of these active women 55+ years of age and how they practice sustainability.
References
China has experienced a great economic development in the past few decades, resulting in a vast dynamic market in China. Meanwhile, urbanization develops at an unprecedented rate; the middle class is increasing because of the gradually added income. With the average per capita income increasing, the upper-middle class possesses significant purchasing power, and they turn their attention to fashion field. Fashion products currently are playing a significant role in Chinese lives. According to Simmel (1957), fashion satisfies the need of differentiation, the tendency to dissimilarities, the desire for change. And Sproles (1979) states that fashion is a way of behaving that is temporarily adopted by a discernible proportion of individuals of a social group because that chosen behavior is perceived to be socially appropriate for the situation. Most societies identify fashion primarily with the field of adornment and costume (Miller & Mantrala, 1993). However, fashion phenomena have transformed the social aesthetic values and influence consumers’ behavior. It is necessary to analyze the underlying affecting factors and predict the fashion trend of the future. On one hand, by a constant change of contents, which provides today’s example to yesterday and tomorrow; on the other hand because different people have different aesthetic values, people from different social classes and different regions generally have different fashion thoughts and fashion behaviors.

Fashion behavior is a complicated and multidimensional concept (Lahiri & Siddika, 2014). There are various factors influencing consumers’ fashion behavior, including age. This study seeks to find how senior females with specific regional identity differ in terms of their fashion behaviors. Targeting the elderly demographic group presents a significant opportunity to apparel manufacturers and market retailers. The age group, although already large, is predicted to increase in size and possesses a large amount of disposable income compared to other age cohorts (Peters et al, 2011). Furthermore, previous research has presented that this age group has specific needs and desires that are not being met by current apparel manufacturers and retailers (Halliwell, 2007; Horyn, 2007). Women over the age of 50 who are interested in fashion want to dress fashionably and are willing to pay for it (Birtwistle and Tsim, 2005; Clarke et al, 2009; Thomas and Peters, 2009). Gender and age have also been identified as antecedents to involvement in various possessions. For instance, Tigert et al (1980) argue that women are more involved in clothing fashion, and Bloch (1981) states that men are more involved in cars. Gender affecting fashion involvement has also been identified by researchers such as Browne and Kaldenberg (1997) and Auty and Elliott (1998) who prove that women are more involved in fashion than men. Moreover, Goldsmith et al. (1996) find that women consider themselves more fashion innovative and engaged than men.

Changes in fashion values and behaviors have a strong impact on the Chinese. This paper aims to analyze the fashion concepts and fashion behaviors in Harbin. In Harbin, people pay attention to the discourse of fashion. For instance, Harbinian have changed their fashion behaviors because of the transformation of fashion concepts and social influence. The role of social influence is particularly apparent in the field of clothing and dressing (McIntyre & Miller, 1992). Harbin, a
city with a long history, is located in the northeast of China. Harbin was once under the influence of Russia and Japan, therefore the Harbin people have an inclusive cultural attitude and an aesthetic combining east and west. Here the fashion concept and behavior also present bright characteristics. The unique fashion tastes of Harbin people are closely related to the history and social changes of Harbin, as well as to the overall social development of China. In the study of fashion concepts and behavior, the subject of fashion is women. This paper focuses on middle-aged and older women’s fashion concepts and behaviors in Harbin. On the one hand, middle-aged and elderly women, especially middle-aged women, have higher incomes and more assets, they have enough purchasing power, which is the main force of the fashion consumer market; on the other hand, the change of fashion view and behavior of middle-aged and aged women in Harbin is the reflection of social change and development. By studying this topic, we will explore the factors that influence their fashion thoughts and behaviors and what is the influence of the change.

References
Fashion Characteristics and Innovative Design of Elderly Clothing in China

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Keywords: Healthy elderly, Clothing fashion characteristics, Innovative design

At present, China has become the country with the largest elderly population in the world. According to the latest data of the National Bureau of Statistics, 24.9 million people are aged 60 and above, accounting for 17.3% of the total population, of which 158.31 million people are aged 65 and above, accounting for 11.4% of the total population. China is in an aging society.

The Shanghai Geriatrics Society of the Chinese Medical Association defines healthy elderly people from the macro perspective as a measure of their health, such as the first-degree changes of their motor system, nervous system, main visceral organs, and the presence or absence of obvious diseases. With the continuous improvement of living standards and health care in China, the number of healthy elderly people is increasing.

Despite the increasing number of healthy elderly people in China, the clothing market for the elderly is very cold and cheerless. There is almost no clothing that can meet the fashion needs of the elderly. Few clothing companies specialize in the design and development of fashion clothing for the elderly in accordance with the older consumers’ fashion characteristics, aesthetic habits and fashion trends.

With the development of China's economy and the change of the elderly’s consumption concept, the demand consciousness and consumption desire of the elderly for fashion, health and entertainment are becoming stronger. Meanwhile they are willing to devote themselves to satisfying their better material and spiritual needs. This paper analyzes and studies the aesthetic characteristics and wearing habits of elderly people in China and summarizes the fashion characteristics of elderly people's clothing at this stage. In addition, fashion features are applied in the design of clothes for the elderly to develop a series of clothing products that not only conform to the physiological characteristics of healthy elderly people in China, but which also conform to fashion trends.
American Female Seniors’ Responses to Mature Models in Bra Advertising.

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Keywords: Body image, Bra advertisements, Congruency effects, Mature models

While the increased need for well-fitting garments and the psychological aspects of clothing selection have been discussed for several decades, the clothing preferences and purchasing behaviors of female seniors aged 55 and over have not been fully addressed in the literature. In particular, bras, which are closely associated with physical and psychological factors as they compensate for the aging body, have been ignored (Risius et al. 2012). According to the self-congruity theory (Sirgy, 1986), consumers have positive attitudes when advertising appeals are congruent with their self-concept (Hong and Zinkhan 1995). Thus, this study has two objectives: first, to explore whether the use of mature models over the age of 40 over young models in bra advertising leads to more positive senior consumers’ responses; second, to propose and test a model that illustrates the process by which types of congruency (i.e., cognitive age, body image) influence consumer responses. It is hypothesized that the use of mature models, representing senior customers, leads to more positive consumer responses than the use of young models due to congruency effects.

A pretest was conducted with 25 American female seniors (average age = 63.32) via Amazon Mechanical Turk (MTurk). Participants evaluated 12 different models all in a white bra, and one young and one chosen in consideration of no difference in attractiveness and credibility but a difference in perceived age between the two models.

The main study employed a single factor (ad with a young vs. mature model) between-subjects experimental design. All measurements, including self-model cognitive age and body congruencies, ad attitudes, and purchase intentions, were adopted from previous studies to ensure strong validity. Data obtained from 78 American female seniors (average age = 62.44) recruited from MTurk was used for the analysis.

A manipulation test confirmed that the young and mature models were significantly different in perceived age (average age of young = 36.6, mature = 54.3) but had no difference in attractiveness and credibility. A MANCOVA was conducted with ad involvement as a covariate. The results showed that the mature model led to higher self-model body image congruency (F = 14.48, p < .001), more positive attitudes toward the ad (F = 9.87, p < .01), and greater purchase intentions (F = 5.08, p < .05) than the young model, confirming the congruency effect. There was no difference in self-model cognitive age congruency between the two models. To investigate the relationships among ad models, self-model body congruency, ad attitudes, and purchase intentions, Hayes’ (2012) PROCESS macro (Model 6) was used. The mediating role of self-model body image congruency was significant (b = .18 with 95% CI = .01 to .46).

This study demonstrated that the use of mature models in bra advertising to target senior customers, perceived as congruent with the target customers’ body image, was more effective in increasing
positive evaluations and behavioral intentions than the use of young models. Choosing the relevant attributes (e.g., attractiveness, personality, image congruency; Erdogan, 1999) is important to develop a desirable congruency effect. Self-model body image congruency is an important predictor of the effectiveness of using mature models in bra advertising. This study extends the existing literature on advertising response models by focusing on the responses of senior customers toward bra brands, which is a potentially lucrative though less elucidated market. Future research is needed to further examine how these effects vary between older versus younger female consumers.

References
Session 3A -- Design

Exploration on the Application of Chinese Silk Tapestry Craft in Clothing Design for the Ageing Population

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Keywords: K’o-ssu, Fashion design, Ageing population, Traditional handicraft

At present, there is a lack of innovation in the fashion design for the elderly group in China. The style is old and the pattern is monotonous. There are very few choices of clothes for the elderly, while the demand of this group is increasing. Therefore, deeper exploration is needed aiming at the design of clothing for the elder. As the essence of traditional Chinese handicraft, Chinese silk tapestry or K’o-ssu is integrated into the fashion design for older people. On the one hand, it meets the aesthetic needs of older people, satisfies their cultural identity and improves their life quality. On the other hand, traditional cultural elements also provide continuous creative inspirations for fashion design for ageing population.

Silk as the basic material, plain weave as the basic organization, "keep warp and cut weft" as the basic weaving method, Chinese silk tapestry is called “the sage of silk”[1] It is a kind of silk weaving handicraft with design patterns on both sides and it is produced by the most primitive civil mechanism. This paper aims to analyze the development and change of the Chinese silk tapestry from ancient times to the present, summarizes the reasons for its evolution and inheritance, and deeply understands the cultural gene and artistic connotation contained in Chinese silk tapestry craft from the perspectives of history and geography. We will mainly use literature research, field visit, and case analysis methods. The weaving techniques, patterns and application forms of Chinese silk tapestry are studied and sorted out to explore the origin of Chinese silk tapestry and clothing. Through onsite investigation in Shanghai, Suzhou and other places, the attempts to produce K’o-ssu clothing products by contemporary K’o-ssu enterprises, K’o-ssu studios, K’o-ssu artisans are explored. The expression of clothing structures, patterns and colors in fashion design for the elder are studied through visual observation and case analysis. In conclusion, the paper focus on the meaning and value of K’o-ssu craftwork used in clothing for ageing population in the context of the times.

Incorporating K’o-ssu in clothing for aging population will contribute to the inheritance of Chinese handicrafts. K’o-ssu will not only enhance aesthetic and artistic values of clothing but also contribute a high quality product for the garment industry. This research will explore how the K’o-ssu craft can be better integrated into the design of older people’s clothes to meet the demands of older people for fashion and quality, and thus improve their happiness and satisfaction of life and contribute to the "active aging" process.

Reference
Applications of Chinese traditional texture pattern in fashion design for mature people

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Keywords: Traditional patterns, Apparel design, Mature people

There is a long history of Chinese traditional patterns with abundant forms reflecting the Chinese aesthetic that have been favored by fashion designers around the world. There are Chinese patterns with special cultural meanings that emphasize the characteristics of mature people. There are special design elements for ornaments of mature people’s apparel that originated during the Ming and Qing Dynasties. With the development of modern fashion, the design of traditional patterns should be transformed to modern aesthetic requirements.

Modern fashion designers for mature people could start their new explorations in the following steps: 1. Figure out the relationship between mature people’s apparel and Chinese traditional pattern. The former determines the latter. Then extract typical units and features of the traditional patterns in design. 2. Use an innovative deductive method to design and create new patterns based on traditional ones. In addition, creative craftsmanship and techniques are also effective.

Designers should take full consideration of fashion styles of mature people and reach the best balance between fashion and tradition. The following aspects will be explored for modern fashion designers: the potential variability for traditional patterns including extracting the typical design units and features; innovations related to the craftsmanship and techniques. The surface design of apparel is critical in expressing traditional patterns in new ways and forms.
Figure 1. the original pattern of Baoxiang flower and modified pattern

Figure 2. the costume of mature aged female decorated locally using Baoxiang flower

Figure 3: multiple craftworks to express the traditional pattern
The Application of an Intelligent Customization System in Making Clothing for the Middle and Old Aged Consumers

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Keywords: Clothing, Intelligent customization, Application

With the deepening of the aging society, the number of middle-aged and elderly people growing rapidly, the popularity of the Internet is gradually affecting their clothing, food, housing, and travel. The middle-aged and elderly body shape changes more obviously, and their demand and purchase of clothing are more diverse compared to those of the young. This project aims to design a set of "closed intelligent clothing customization system" to better serve the middle-aged and elderly consumer groups through the analysis of their clothing demand and purchase characteristics. First of all, the body shape data is collected by the 3D intelligent votometer in one time, the date is then transmitted to the terminal in 30 seconds which is obtained by scanning the QR code on the mobile phone. In the second step, virtual fitting is carried out in the dressing mirror to generate personalized two-dimensional renderings of human clothing. The third step is to choose the style of clothing for mobile fitting. The fourth step is to select and adjust the style and place the order, and the individual data will be automatically transmitted to the factory in the background, then the garment will be made quickly through the SAAS flexible processing system. The fifth step is intelligent logistics. Achieving: "intelligent volume, virtual fitting, mobile ordering, remote delivery, intelligent manufacturing, fast logistics, custom home delivery" clothing intelligent customization system. The system will reduce the intermediate links in the selection of clothing for middle-aged and elderly people but also promotes the development of intelligent customization of clothing for people of all ages.

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Research on the Acceptance of Ink and Wash Application in Middle-Aged and Old-Aged Clothing

Xiaobo Xue, Shanghai Institute of Visual Arts, China
Bo Peng, Donghua University, China

Keywords: Mature people, Fashion

This paper takes the Middle-aged and Old-aged people as the research subject and studies the characteristics of Middle-aged and Old-aged clothing through the demand for clothing by these people. We has studied the acceptance of ink-and-wash patterns in the Middle-aged and Old-aged clothing graphic application in the form of questionnaires. Most of the people surveyed believe that ink patterns are the embodiment of Chinese traditional culture, and they also believe that there is a lot of space for the application of ink patterns in clothing. This article uses Chinese contemporary excellent ink works as materials, and these excellent in works was applied to fashion design. The final costume works is presented in the Ink Art Exhibition at the China Art Palace.

Compared with young people, the older people do not need to deal with work or social orientation, and they have greater freedom and self-identity for the choice of clothing. They also show a higher demand for cultural expression in the state of self-spirit. The design of the graphics of clothing has become an important point in fashion design, because the body shape changes maybe ignored under the cover of ink-and-wash graphics.

This paper discusses the use of traditional Chinese ink painting in the design of clothing graphics, and the ink art was displayed on the clothing in the form of graphics, and finally, the exhibition of these clothing were presented through the China Art Palace Ink Art Exhibition. Traditional Chinese ink painting pursues the beauty of dignity, subtleness, charm and artistic conception. The requirements of the Middle-aged and Old-aged people for clothing are solemn, decent, and temperament. The feature of Traditional Chinese ink painting and the requirements of the Middle-aged and Old-aged people are similar, which makes the mature people have higher acceptance of ink-and-wash clothing. In modern society, fashion is also the requirement of mature clothing. Under unique aesthetic meaning of China, the traditional paintings are redesigned, giving traditional ink art forms more modernity. The ink-and-wash graphics designed by modern design techniques not only have the temperament of Chinese culture, but also meet the aesthetic needs of the Middle-aged and Old-aged people.

This paper studies the acceptance of ink graphic application in middle and old age clothing, and also discusses the possibility of ink graphic application in middle and old age clothing design. Ink graphics provide a broad space and huge realization possibilities for these people’s clothing graphic design field.
Session 3B -- Socio-Cultural Aspect of Fashion

A Comparative Study on Aging Cultures between China and the United States and their Influences on Clothing Design

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Keywords: Aging fashion design, Aging culture, China and America

Both China and the United States are facing aging issues together. China is a developing country while the United States is a developed country. They have different aging issues to deal with. How each culture orients their people toward aging could be drastically different, which have important implications on clothing design. But the common issues relating to the aging of human bodies call for collaborative solutions. Thus, it is timely for us to conduct cross-cultural research in this globalized era.

The purpose of this opinion paper is to understand from a cultural perspective how each country approach aging, including differences and similarities. What does aging typically mean for a Chinese and an American? How should clothing design address these cultural viewpoints? This paper gathers information from the literature, media, and consumer research reports and attempts to answer the aforementioned research questions.
Fashion Interaction and Identity Construction of Older Females in Chinese Ethnic Groups

Xiangyang Bian, Linzhen Li, Donghua University, China

Keywords: Older Females, Ethnic, Fashion, Identity

Chinese ethnic groups living in the mountains for a long time are facing the impact of cultural and economic globalization, but the older females have less communication with the outside world. With the development of tourism and the world's attention on the intangible cultural heritage, this external information provides "other" references and opens the vision of them. Cultural heritage is not rigid, but dynamic and in constant change. As the main inheritors of cultural heritage, the older females in Chinese ethnic groups are actively combining their experience in dress creativity with current fashion. Because of this, their lifestyle and identity in modern society have also changed. The survey objects of this study are older females in Chinese ethnic group who over 50 years old and joined the fashion public welfare project “Momhandworks”.

This topic combines the case of this fashion co-creation and takes the fashion interaction of older females of Chinese ethnic groups in modern society as a breakthrough point to provide insights and in-depth information regarding the experience and feeling of older females in Chinese ethnic groups who join in the fashion welfare project and participating in the cooperative design. At the same time, the topic also in order to understand the changes of lifestyle, fashion vision and attitude, consumption concepts of older Chinese females and summarizes the identity construction of this group in today's society.

Qualitative research methods are employed for this study. Field work and in-depth interviews specifically capture the richness of the subjects' affections and psychological states by interviewing women who over 50 years old and participate in this project. In this research, the following four aspects are mainly investigated:

A. Experience and perception in this fashion cooperation.
   The following research questions are posed:
   How to integrate creation in the process of fashion cooperation? What feeling under the fashion interactive experience? What are the stages of psychological changes of these older females in ethnic groups participating in fashion interaction?

B. Fashion attitude and vision change of older females in Chinese ethnic groups in modern society.
   The following research questions are posed:
When did you know the concept of "fashion"? What is your current understanding of "fashion"? What are the linkages between the changes in vision of these older females in ethnic groups and their fashion interaction? What clothing styles do older females prefer for daily, festival or important occasions? What do you know about fashion designers?

C. Lifestyle of older females in Chinese ethnic groups.

The following research questions are posed:

What was the lifestyle like in the past? What's the lifestyle like now? What is the present family demographic profile? Are any linkages between demographic profile and their lifestyle? How has your life changed since you joined the fashion industry? How do you join the fashion creative business? How long for your working time? ...

D. Consumption concept of older females in Chinese ethnic groups in modern society.

The following research questions are posed:

By understanding fashion and taking participate in fashion interaction, is there any change in current consumption concept? What is the change?

This research intends to understand the participation of elderly women in Chinese ethnic group in fashion activities through such a series of interviews and field surveys and establish the continuous connection between them and fashion to make contributions to the promotion of positive aging by basing on the fashion interaction experience.

References

The Clothing Design of Leisure and Entertainment Styles for the Aged in Shanghai

Jie Zhang, Shanghai Institute of Visual Arts, China

Keywords: Elderly people in Shanghai, Leisure and entertainment style, Clothing, Design

Shanghai is not only the Chinese economic and financial center, but also the fashion capital of Asia. Shanghai is the earliest city to enter “aging society” in China as well. "Silver economy" is gradually becoming an important part of the market economy in Shanghai.

Through the actual investigation and data analysis, this paper studies the characteristics of leisure and entertainment modes of the elderly people in Shanghai and analyzes the demands of different leisure and entertainment styles on clothing. A total of 500 questionnaires were conducted among elderly people in different regions of Shanghai. Through actual investigation and data analysis, this paper studies the characteristics of leisure and recreation modes of elderly people in Shanghai. This paper analyses the demand of different leisure and entertainment modes for clothing. Thus, the characteristics of daily clothes suitable for elderly group leisure and recreation in Shanghai are obtained. And based on the results of this study, the trend of elderly clothing in Shanghai is also discussed.

From the perspectives of style, color, fabric and so on, this paper expounds the clothing design elements and methods for the leisure and entertainment of the elderly people in Shanghai, in order to provide theoretical basis for the clothing design of the elderly people.
Active Seniors: What do They Want?

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Dongeun Choi, Sangmyung University, Korea

Keywords: Active senior, Design needs, Silver industry, Marketing strategy

Bernice Neugarten, a former psychology professor at the University of Chicago, has coined the term ‘Active senior’ to describe people in their 50s and 60s who are socially and economically active. With people aged 65 and older surpassing 14 percent of the population, Korea is one of the fastest aging societies. Domestic silver industry in Korea is at the early stage compared to Japan and United States due to higher population ratio. However, retail industry has been noted that the consumption of the senior generation has been steadily increasing, largely unaffected by business fluctuations. Due to recent attention of the senior industry as a blue ocean, distribution industries in various fields are making strategic marketing approach to them.

To establish the strategy of retailing, marketing, and communication targeting for seniors, understanding their needs will give us a chance to prepare for the realization of this huge potential market. Therefore, in this study, the needs of active seniors related to design were examined. Data was collected through the keywords search from Congress Digital Library and Internet. Based on the selected data from previous studies, related articles and reports, the content analysis of research method was conducted. As a result of the study, the major requirements to cater for the design need of Active Senior can be boiled down to the following three aspects.

1. Convenient but stylish products
A researcher from Firstview Korea noted that usually as soon as seniors are related to a brand, or other obvious identifiers, the brand’s value slumps. Since brands often promote functionality for different body types and comfortable fit, they have not been popular with seniors. Industries need to better understand their customers taste and reconsider their own strategy.

In 2013, Lotte Department Store closed their ‘silver gift shop’ which has been open for 2 years in the main store. The shop had opened in 2011, after the prediction of emerging silver industry, selling health nutrition foods, medical supplements, wigs and fashion goods in one store, but failed in sales. Company officials had analyzed it was to target 5060 generations, however seniors do not recognize themselves as a senior group and tend to believe they are simply an older generation teenagers.

2. Digilog for ‘Smart Silver’
Samsung Economic Research Laboratory presented 5 trends for 2020, health, family, leisure, social participation, and digital life. From this report, the fashion industry needs to focus on ‘smart silver’ as the business model, as those who were previously using analog are now using computers and smart phones on a daily basis. The report suggests although ‘smart silver’ are familiar with digital equipment, they still have sensibility of analog, therefore applying both ideas (so-called ‘Digilog’) to absorb the demand. This is an approach to mix the latest IT technology and the sensibility to graft individual’s need.
As active seniors became a big customer group in the electronics market, Cuchen, an electronics company, launched a new cooking product for active seniors, which was equipped with a ‘Smart Dial’ system inspired by classic audio. As this was a premium product and compact with enhanced features for senior users, it became one of the best-selling items in 2012.

3. New internet marketing for active senior
Lately, online shopping, which was previously exclusively used by people aged between 10s-30s, is now being enjoyed by the active senior people who usually went to off-line stores and department stores for shopping are now using online shops and emerging as the major customers in shopping industries.

GS Shop, one of the country's largest online shopping malls, recently launched an online store called Ohau, exclusively for those aged 50 and older. The site primarily deals with cosmetics, medical equipment, and clothes. A GS Shop spokeswoman said that 50-somethings were not a big fan of online shopping in the past, but recently, more and more senior citizens are buying merchandise on the Internet amid the widespread use of smartphones and tablet PCs. Knowing this, retailers like GS Shop make it easier for seniors to navigate their websites with large print and wide margins. They simplified product categories, removed pop-ups, and tried to make the site as simple as possible. For those unwilling to make online payments, they can call operators standing by 24 hours a day, or if they leave a message, the operators will call them.

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Active Aging and Fashion Panel

Active Aging and Fashion

Pamela S. Norum, University of Missouri, USA

Keywords: Design, Culture, Fitness, Well-being

Given the youth orientation of the fashion industry, the needs and wants of the active aging consumer are frequently overlooked in the marketplace. This market segment is neglected despite the fact that by the year 2030, between 25% and 30% of the U.S. population will be over the age of 55, nearly double the percentage in 2012 (Ortman, Velkoff, and Hogan, 2014). In 2019, the youngest members of the Baby Boomer generation, born between 1946 and 1964, will be 55 years old. Baby boomers are considered the first generation to embrace active aging. This has implications for a variety of fashion related industries.

Fashion, although commonly associated with apparel, also extends to other products or services that can assist older individuals in the areas of identity, self-image, physical performance, health, and well-being, as well as the physical spaces they encounter. Insight about the active aging consumer on a range of fashion related topics will suggest ways to better meet the needs and wants of this consumer segment. The purpose of this proposed panel is to bring together a group professional who can provide a variety of perspectives related to fashion and active aging.

Below are the names of each panelist and the area they will discuss as a panelist.

• Depiction of women aged 40 and older in selected U.S. magazines
  Jane Farrell-Beck, Professor, Emerita
  Apparel, Events, and Hospitality Management
  Iowa State University

• Aging bodies and dress of women 40 and older
  Nora MacDonald, Professor Emerita
  Fashion, Dress & Merchandising
  West Virginia University

• Fashion design and innovation addressing health and well-being
  Kristen Morris, Assistant Professor
  Textile and Apparel Management
  University of Missouri

• Links between architecture, housing, interior design and older individuals
  Genell W. Ebbini, Assistant Professor
  Design, Housing, and Apparel
  University of Minnesota

The panel will be 60 minutes in length. Pam Norum, Professor, Textile and Apparel Management at the University of Missouri will be the moderator. Each speaker will have no more than 12 minutes to speak on their topic with a minimum of 12 minutes for questions and discussion.

Session 4A -- Consumers

Observing Universal Design in a Residential Retail Environment for Seniors

Meghan Hendrickson, University of Minnesota, US

Keywords: Aging, Universal Design, Retail Design, Senior Housing

This observational study investigates universal design within a retail setting inside a residential facility for seniors. Seniors, because of mobility, hearing and sight loss, are likely to have barriers when shopping compared to the general population. (Hare, Kirk, & Lang, 2001; Park & Farr, 2007; Underhill, 2009). A Universally designed facility will be able to adapt to the needs of all users equally. Aspects of the designed that were observed include merchandise reachability, visual organization of the merchandise, presentation modes, and the store layout with regards to shopability for all. Research questions include:

1. How many users appeared to have trouble reaching the merchandise? Universal Design Guideline 7b: Make reach to all components comfortable for any seated or standing user.
2. Signage and Organization: How many users appeared to have trouble finding the card they were looking for? Universal Design Guideline 4B maximize legibility of essential information.
4. Were there any display areas in the store that weren’t well shopped? Were there restrictions with sight or reach that prevented shoppers from accessing these items? Universal Design Guideline 7D: Provide adequate space for the use of assistive devices or personal assistance.

The site chosen for this observational study was a gift shop within The Glenn Assisted Living in Hopkins, MN. Forty-seven shoppers were observed. Findings support the notion that the aspects of this store that contribute to universal design create an environment that is convenient and enjoyable for the residents of this senior living facility.

References:
Exploring Middle-Aged and Old-Aged Clothing Brand Market and Their Future Development Direction

Youran Wu and Rong Yuan, Shanghai University of Engineering Science, China

Keywords: Middle-aged and Elderly women, Brand culture, Consumer psychology, Clothing design

In a consumer society dominated by youth, most fashion brands are trying to appeal to young people's tastes. Based on this environment, fashion trend forecast and consumer psychology research are mostly geared toward young people's preferences. By contrast, the under-appreciated fashion market for middle-aged and older women is stretched thin. Thus, the aim of this paper is to analyze the marginalization of elderly women's clothing brands and to provide insights and solutions.

The investigations in this thesis is divided into two parts: online questionnaires to collect data about the shopping features and preferences of elder women; field investigations in the major shopping malls in Shanghai to study the design styles and marketing strategies of established elder women’s clothing brands. Meanwhile, further interviews were conducted with some brands, such as kuotai and FISHING, and the brand culture and current market competition were analyzed. Based on the aforementioned studies, this thesis showed the dilemma faced by elder women clothing market that is reflected in three contradictions.

From the perspective of social background, it is mainly the contradiction between the fashion discourse power dominated by the youth subculture and the fashion environment of the middle-aged and the elderly women. In terms of design style, there is a contradiction between the positioning of brands targeting only young consumers and the desire of middle-aged and elderly consumers to be stylish. Finally, from the perspective of consumer psychology, there is a contradiction between the increasing material and spiritual needs of aging consumers and the scarcity of psychology research focusing on middle-aged and elderly consumers. Consumer demand can be predicted by the application of consumer psychology of design, which can also help to react to the design style and marketing strategy. However, the psychological research towards elder consumers in the market is still lacking.

Increasing the brands’ innovation ability is the core of solving the three contradictions and is the foundation of expanding the market influence. The key to increase the innovation ability is keeping the balance between “brand culture and product design”, instead of staying in a rut or drifting with the current.
Effects of Background Color and Color Coordinated Product Displays on Consumer Satisfaction and Purchase Intention

Ahmad Saquib Sina and Juanjuan Wu, University of Minnesota, USA

Keywords: Warm color, Cool color, Consumer satisfaction, Product coordination display

The primary purpose of this study is to investigate the effects of background color and color coordinated displays on consumers’ satisfaction and purchase intention. Both warm and cool color families were used for the background. Previous studies showed the effects of colors on consumers’ preferences (Bellizzi et al., 1992; Turley and Milliman, 2000). However, limited study exists to understand the effects of background colors used along with color coordinated product displays on consumers’ responses. This study compared aging consumer (age 55 or above) and younger consumers (undergraduate students, between 18 to 23 years old) in their responses to the stimuli to add an additional layer of information regarding age.

Previous studies explained color as an atmospheric cue in the retail environment (Bellizzi et al., 1983; Eroglu & Malceit, 1993; Turley & Milliman, 2000). Roschk et al. (2017) conducted a meta-analysis of the effects of color on consumers’ responses and found that color families (warm/cool) influence consumers’ pleasure, arousal, satisfaction, and behavioral intentions. Cool color induces pleasure and warm color induces arousal. However, warm color decreases satisfaction. Coursaris and Osch (2016) showed that when the temperature of color increases, it negatively impacts both classical and expressive aesthetics. Product coordination refers to the way products are grouped based on similar characteristics such as color, texture, and style (Wu et al., 2013). This study groups products based on their warmness or coolness in color.

This study conducted a 2 (Background color: Warm x Cool) x 2 (products grouped by color vs products not grouped by color) experimental design. Four stimuli (see Figure 1 & 2) were developed using Mockshop – a 3D virtual retailing software package. The Cronbach’s alpha value for all instruments is above 0.8, indicating a good reliability. A total of 200 US consumers took part in this study. 100 of them were ageing consumers and the remaining 100 were younger consumers. MANOVA analysis confirmed a successful manipulation. Among the four different types of display methods, consumers preferred the method of cool background couple with product color coordinated display than the rest of the three display methods. Also, younger consumers ($M=4.5, p<0.001$) showed higher preferences for the cool background and color coordinated product display than the aging consumers ($M=3.6, p<0.001$).

The implication for this study is that retailers need to consider the coordination of interior background color and product color when playing with the design element color as well as the age variable to enhance consumer satisfaction and purchase intention.

References


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**Fig1:** Cool color background and product color coordinated display

**Fig2:** Warm color background and product color coordinated display
Consumer Perceptions of Sustainability: Comparing Two Age Groups in China

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Juanjuan Wu and Marilyn Delong, University of Minnesota, USA

Keywords: Sustainability, Older consumers, Chinese

Traditionally, Chinese believed in the unity of nature and human. Their lifestyles were characterized by frugality and simplicity. However, the economic development has greatly changed Chinese beliefs and ways of living. Each year, over 15 million tons of discarded apparel pack landfills (Yang et al. 2017). The “First National Pollution Source Survey Program” issued by the General Office of the State Council of China (2009) listed the textile industry as a key polluting industry.

Responsibility urges the entire society to pay more attention to the protection of the nature on which we depend. This paper aims to understand the generational differences in Chinese consumers’ perceptions of sustainability and thus provides insights into actionable interventions. We focused on two age groups: one born in 1995-2000. They are college students and their major mainly in textile and clothing or design. So, they are future textile and clothing professionals or designers. The other group born in 1950-1970. They can be seen as a transitional group that holds both traditional and contemporary values.

A total of 178 questionnaires were collected, including 157 younger and 21 older consumers. The questionnaire includes both open-ended and closed-ended. Results show that the older consumers wear their favorite clothing longer than the younger consumers. The median length of time wearing their favorite clothing is 39 months for the older consumers and 24 months for the younger consumers. The mode is 60 months for the older consumers and again 24 months for the younger consumers. Factors influencing preferences for favorite clothing are similar between the older and young groups. Comfort, versatile, quality, good look and classicism are listed most often as factors influencing clothing preferences for both age groups. The older consumers value the clothing brand (42.9% vs. 15.9%) and the compliments from others (33.3% vs. 18.5%) more than the young consumers. In the consumption stages of purchase, use and dispose there is a higher percentage of older consumers (66.7%, 52.4% and 71.4%) than young consumers (44.1%, 50.7% and 65.1%), who consider sustainability. Similarly, more older than young consumers consider sustainability important. There are 75% of older consumers rated the importance of sustainability higher than neutral but 58.6% of young consumers rated this way.

The results confirmed that the older generation is more frugal and also place more importance on sustainability in their consumption than the young consumers. There seem to be a need to educate the young generation in terms of inheriting their parent generations’ value and modeling after their sustainable behaviors.

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Session 4B -- Socio-Cultural Aspect of Fashion

A Lifetime in the Workplace: Diversity and Change in Appearance Goals of Working Women in the Twin Cities, Minnesota

Caren S. Oberg, Marilyn DeLong and Barbara Heinemann, University of Minnesota

Keywords: Women’s career, Appearance, Expression, Identity

Professional women engage with individual and social issues of aging, appearance, and identity throughout their careers. The challenges professional women have faced since the 1970s have changed how they view themselves in their more varied contemporary careers and their perceptions of how others view them (Collins 2009). Issues of aging and identity, in particular, are reflected in the clothing choices made by these women. Unlike other recent studies, which focus on women’s reflection of their workplace clothing at a specific moment in time (Ericksen, 1992; Peluchette et al. 2006; Peluchette et al. 2007), we sought to understand this long-term relationship between these women’s work clothing and how they created both an individual and public identity throughout their career.

We selected 14 women in prominent and diverse careers in the Twin Cities for an interview. Because this was about women with career longevity, we selected women who are at the peak of their career or were at the peak when they retired. We asked about how they managed their appearances throughout their careers. We asked women to reflect upon the clothing they wore throughout their careers, to discuss how they developed their sartorial identity in the workplace, and the impact of age and career progression on that identity.

Our interviews were based in phenomenology, specifically the classic work of Max Van Manen. The interviews were unstructured to optimize the potential of stories that would help us understand their lives and how they chose to appear at their career peak and the clothing each chose to wear throughout. We asked a series of questions and then asked for a photograph that captured them in the way they liked to appear. We focused on the stories each woman told about experiences with her clothing, including the motivation for selecting items, what she valued in the wearing, and those practices and experiences of wearing that made her appearance work for her. Interviews focused more specifically on the way work clothing formed a narrative for both continuity and change in each woman’s career.

In our analysis of the interviews, we considered the way each interviewee narrated the continuity and change of her appearance as related to her career through decades of work experience. Responses were organized into groups built around the women’s early career narratives–20s-30s, mid-career narratives –40s-50s, late-career narratives –60s-70s, and post-career narratives –70s-80s. We found that these women consciously thought about the meaning and impact of work and wardrobe as they passed through each age group; clothing played a significant role in these women’s careers. However, the actual goal of each woman was very different. As each woman had progressed career-wise, she became more confident in expressing her individuality. We learned through the stories they told how the art, practice, and meaning around dressing for
work changed over time even though there was both continuity and diversity in their expressed outcomes.

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The Effect of Fitness on Aging: Correlation between Self-image Perception and Physical Body

Yuqing Guo, Keyan Liu and Weiwei Hua, Shanghai University of Engineering and Technology, China

Keywords: Fitness, Body aging, Self-image management

In today's society, people generally supplement their nutrition in order to live a healthy life. The positive role fitness plays in the process of active aging has gradually gained attention. There has been a wealth of evidence in brain science research that fitness improves brain’s cognitive function\(^1\). As an important component of an active lifestyle, fitness has become an important topic as well for researchers to understand its effect not only on the physical body but also on the psychological self-image. The purpose of this study is to understand how fitness influence one’s self-image in relation to the physical body.

Our sample includes Chinese living in Shanghai, who are active in fitness activities in their 40’s and 50’s. Within a three-month time, we record 1) changes in weight and observable bodily changes; 2) before and after surveys of the participants’ self-image perceptions. We analyze the correlations between the changes in weight and physical body and changes in perceived self-image.

Reference
Research on the Promotion of the Visual Image of the Active Aging

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Keywords: Active aging, Visual image, Design

With the rapid development of new media applications today, diversified social media are constantly appearing. Therefore, to meet the demands of the active aging, design of the traditional visual image of this population can no longer meet the new promotion requirements. The visual image being promoted and used in the traditional media is no longer creative. It must be combined with new media to design and plan new concepts and ideas to promote this population. This paper takes the visual image of the active aging as the research subject and explores more positive images.

The purchasing power of China's aging population is increasing at a dramatically high rate. Compared with some younger audiences, they are likely to have more free time and a higher enthusiasm for participation in activities. Therefore, their activities form an important role that can be promoted in the major media. Use of social media has greatly improved the speed and scope of dissemination, and the amount of information and the interaction with users is also improved. Therefore, design of today's visual image of elderly should adapt to objective laws in the aspect of concept, thinking and performance.

This paper takes the design and promotion of the image called “seeking silver radiance” as an example, and explores the conceptual positioning, context definition and expression of this visual image. First of all, today's active aging is not the "out-of-the-air crowd" in the traditional sense; they are the practitioners who have experienced, directly participated in, and witnessed China's reform and opening up to the world. For this population, their outlook on such aspects as life values, psychology, aesthetics, are different from today's younger generation. The universal characteristics of this older generation are many, such as advocating ideals and conviction, hard work, diligence, thrift, and the pursuit of excellence in life.

This paper takes the "seeking silver radiance" visual image as an example to analyze and discuss and provide some reference for design of the visual image for middle and elderly age ranges. In the design to promote this more positive image, it is particularly important to choose visual language symbols and graphics which have these features: sturdy, artistic, and creative. Secondly, the designing of the image is the most direct and abstract expression; it is also the form of the visual image theme, and it can be used as the direct symbol of information. For physiological characteristics, design for this population should emphasize font selection and application. Although the design needs to be coordinated with the times, cultural heritage is closely related to tradition. The preference for color reflects the collective aesthetic characteristics of the active aging in China. In choosing suitable colors, they are likely to accept a more resonate visual image, and finally, form a unified visual system of cultural characteristics and a national style for this image. The promotion under the new media mainly through the Internet, mobile clients and other smart devices will help to promote their dissemination so that communication of a more positive specific visual image will spread higher and wider.
Design of the visual image in the context of new media puts forward higher requirements for the traditional visual image. It not only needs to meet the application requirements of traditional media, but also have the features of new media such as flexibility, quick wake-up, intuitiveness and interactivity. Indeed, such a visual image will be more humanized!
Active Aging in the US: A Google Trends Data Analysis Based on States

Bo Ra Joo and Juanjuan Wu, University of Minnesota, USA

Keywords: Aging society, Active aging, Anti-aging cream, Senior style

Introduction
Since the last decades of the twentieth century, a new paradigm in research on aging and gerontology has promoted a positive view of aging, associating it with such adjectives as active, healthy, successful, and productive. Active aging has now become a worldwide phenomenon (Fernández - Ballesteros et al. 2013). According to the US Census Bureau (2017), adults aged 65 and older accounted for 15.2 percent of the total US population in 2016. Statistics show the population is aging, but there is little research on how people fulfill their needs for active aging, for example, consuming fashion products. Therefore, this study aims to fill this literature gap through a Google Trends data analysis that addresses fashion needs for the aging consumer in various states within the US.

Research Background
Older adults in the US are working and pursuing beauty for longer than previous generations: such active aging is essential in an aging society in which the average US life expectancy increased from 68 years in 1950 to 79 years in 2013 (Mather 2016). With aging, people tend to get unhappy with the way they look, but fashion can improve both the appearance and the self-esteem of older adults (Chowdhary 1988). Thus, many such adults seek fashion information from the media to pursue satisfactory aging results (Pires 2018). Thus, we propose that the transition to an aging society will increase the need for active aging and that people would be interested in and seek out, via Google, fashion information for their active aging needs.

Methods
We used Google Trends, a free information-search service platform provided by Google, and conducted a big data analysis. We tracked US Google users’ search keywords between July 2014 and November 2018. Then, we investigated the correlations between search keywords regarding aging society, active aging, and fashion information for the aging consumer by using analogous terms for each keyword so that we could include most words that are frequently searched in the US.

Results
Pearson correlation test results showed that the keyword “aging society” is positively correlated with “active aging” ($r = 0.176, p < 0.01$), “healthy aging” ($r = 0.231, p < 0.001$), and “anti-aging” ($r = 0.147, p < 0.05$). “Anti-aging” was strongly positively correlated with “anti-aging cream” ($r = 0.648, p < 0.001$). In addition, “healthy aging” was positively correlated with “senior style” ($r = 0.169, p < 0.01$). When we focused on US Google users’ interest in “anti-aging cream”, Google Trends showed that this interest was at its highest in the new year (i.e., in January of 2015, 2016, and 2017) and in the states of New York, Arizona, New Jersey, Massachusetts, and California, in that order. In addition, “senior style” was most frequently searched in Florida, Texas, and California, all southern states.
Conclusion
The results indicate that, as expected, Google users in the aging society of the US were interested in active aging, and they are also interested in anti-aging cream and senior style as potential solutions as they pursue active aging. As US society continues to age, it is expected that older Americans’ fashion consumption will also increase. This study contributes to the active aging literature and has practical implications: specifically, manufacturers and retailers could focus on the new-year period and those states where older adults are strongly interested in fashion information in order to fulfill consumers’ active aging needs better.

References
Session 5A -- Design

No Place like Home? Shifting Design Ideals for Eldercare Facilities

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Keywords: Interior design, Architecture, Placemaking, Aging

Overview and Significance: Both experts and the general public acknowledge that the impending “silver tsunami” – the aging of our population – presents social, economic, healthcare and infrastructure challenges that must be addressed immediately to ensure the well-being of older adults, their families and their communities (He et al., 2016). This demographic pressure, alongside an increasing focus on “patient-centered care” since the 1990s, has prompted a growing body of research and practice in the design and architecture fields that recognizes the powerful impacts of care environments on health outcomes and well-being (Bromley 2012, Devlin & Arneill 2003; Douglas & Douglas 2005). This paper considers this paradigm shift in terms of its material, aesthetic, and discursive impacts on “placemaking” (Buse et al. 2016, Low 2009, Williams 2010) - the social construction of space in eldercare.

Research Design and Methodology: Drawing on discourse and visual analysis of a corpus of grey literature related to best practices in health design, this research focuses on two central aspects of “placemaking”: designs emphasizing “household/home-like and neighborhood” aesthetics; and designs negotiating distinctions between the “public” and “private” spaces of residential eldercare facilities. Our sources include the complete series of the American Institute of Architects’ (AIA) Design for Aging Review (biannual, 1991 – present), which features award-winning eldercare projects in the fields of architecture and interior design; as well as published best practices pamphlets and design guidelines for eldercare design (available from associations such as the AIA, the American Society of Interior Designers (ASID) or networks such as the Center for Health Design).

Discussion: We have structured the analysis along three axes: 1. Discourse analysis of project descriptions, including longitudinal study of the frequency of key terms and descriptive categories related to “home,” “neighborhood,” “privacy,” “social spaces,” and “hospitality.” This aspect of the research attends to the waxing and waning of discursive patterns as indicators of industry trends; 2. Comparison of project texts and images. Here, the study employs a semiotic approach (Barthes 1977, Kress and Van Leeuwen 2001) to examine where discursive and visual languages converge on one another, as well as where they diverge. Using the terms and categories from the first stage of analysis, the discussion interrogates how a category such as “home-like” manifests in a built design. What are the elements that signify “home” or “neighborhood,” and/or designate a “social” from a “private” space?; and 3. Finally, we return to the theme of “place-making” to consider how architects and interior designers seek to create meaningful and therapeutic spaces for residents, and how these choices reflect their understanding of the possibilities for social interaction, the entitlement to privacy and dignity, and needs vis-a-vis relationships with caregivers and visitors.
Conclusion: Our analysis finds evidence of an industry in flux. Tensions exist between guidelines for specialized care (memory care in particular) and general design trends for facilities catering to residents requiring different levels of care. Similarly, designers appear to struggle with balancing strategies for home-like, household and neighborhood place-making with efforts to create social spaces inspired by commercial paradigms of the hospitality industry.

References
The Research on the Application of Color Psychology in the Design of Senior Citizen Medical-life Apartment

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Keywords: Color psychology, Senior citizen, Medical-life apartment

With the socioeconomic development and accelerating urbanization, population aging is increasing. As physical functions increasingly degenerate, senior citizen’s demand focus changes from the most basic life needs to later stage medical needs. This phenomenon indicates that facilities that provide good services such as care, rehabilitation and medical service become an increasingly important issue for senior citizens. However, the current status of senior citizen medical-life apartment is not optimistic. As of 2018, the number of senior citizen medical facility in China has reached approximately 40,000 with a total of approximately 5 million beds. However, the actual demand is 4.5 times of current number of beds. The unbalance of supply and demand leads to the emergence of various professional senior citizen medical-life apartments. Meanwhile, the demand is increasing for these newly-emerged senior citizen medical-life apartments with respect to their medical environment, taste and match for senior citizen’s demand.

This research is based on the study of current high-end senior citizen medical-life apartments in Shanghai. They provide superior and comfortable life and entertainment services as well as excellent medical support for senior citizens. Inside these apartments, medical facilities are established, reasonable treatment items are set and excellent medical equipments are provided based on the characteristics of geriatric diseases. The health management and disease prevention and treatment of senior citizens are vigorously executed according to medical standards. Currently the high-end senior citizen medical-life apartments we have studied include five institutions such as Shanghai Riyuexing Rest Home and Home of Taikang – Shanghai Garden.

Then, we use principles of color psychology to improve space layout and interior decoration design through relevant case study combined with analysis of senior citizen medical-life apartment user’s visual and psychological characteristics, summing up design methods and color collocation applicable to senior citizen medical-life apartment. The purpose is to improve the quality of current cold treatment and rehabilitation environment for senior citizens and help improve the color environment of current senior citizen medical-life apartment’s interior space, thereby to create a humane, safe, homely and artistic treatment environment for senior citizens.

This research employs methods such as survey, on-site investigation, data analysis and theory summarization. It is expected to find the common ground between technique of color expression and senior citizen’s mentality and behavior from this research. How to apply theoretical methods and design principles to the actual senior citizen medical-life apartment design cases is discussed. With this method, treatment environment for senior citizens can be improved, creating senior citizen medical-life apartment space that meets the aging society’s demands.

This research’s originality is demonstrated through breaking the indistinctive interior space design between senior citizen medical-life apartment and comprehensive hospital. Through
analysis of senior patients’ physiology and mentality, it sums up the particularity of senior patients as well as meeting the demand of escort and medical personnel and designs medical space function and decoration that are specific for senior patients, thereby to improve the feelings of coldness and fear to senior citizens brought by traditional medical space. It uses principles of color psychology and extracts design color matching that meets the requirement of rehabilitation medical space of modern senior citizens, thereby to provide theoretical reference and lay foundation for specific design of China’s senior citizen medical-life apartment’s interior space.
A Study on Functional Pants Design for Older People with Arthritis

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Keywords: Arthritis, Functional design, Pants, Older people

With the aging of society, the number of patients with arthritis has increased. Now there are about 100 million people with arthritis in China. Half of the populations over 50 years old suffer from osteoarthritis, and 90% women and 80% of men over 65 years old suffer from osteoarthritis. Arthritis causes swelling, tenderness and stiffness in the joints, which in the long run may cause changing body shape, decreasing range of motion of the affected joints, and loss of physical function. Restriction of joint motion significantly decreases the ability of older people with arthritis to dress and undress (Naomi Reich et al., 1991; Han Seung-Hee, 2008; Mi-Sung Choi, et al., 2012). So, it is important to solve clothing problems for these arthritis patients. Some researchers have found it easy for them to improve dressing activities by designing clothing fasteners including zippers, buttons, Velcro and snaps, and so on. It is easy to manipulate the zipper and button for aged women who are influenced by conventional garment fasteners and their availability (Merry Jo Dallas, 1982). Recently, some researchers designed supporters or orthotic devices for older people with arthritis. The functional kneepads were designed for knee osteoarthritis patients to reduce pain and improve function (Fan Hu, 2017). Few studies have been focused on the balance among fit, function, and aesthetic needs of older people. Therefore, the researchers chose pants as our research subject. The researchers determined that design and evaluation of pants would build on and contribute to existing research in this area.

The purpose of this study is to propose a new methodology to design and evaluate a set of new pants based on meeting physical and psychological demand of aged people with arthritis. The procedure of study includes four phases: Phase 1 consists in the acquisition of aged arthritis patients’ needs and requirements in their daily life by resorting to focus groups, interviews, and questionnaires. Phase 2 is dedicated to obtaining the body size and shape of older people. Phase 3 is related to propose a set of design recommendations and design a series of pants. Phase 4 consists of evaluating the function, comfort, fit and esthetic of these new pants for aging women with arthritis.

For this study, three older women and three older men participated in the focus group. Then the research collected about 80 questionnaires. Through analyzing this data, the research obtained information about clothing difficulties and propose a set of design recommendations. The researchers found that older women prefer slim style, but they need an adequate range of movement of key joints for many activities. So, the design of this series of new pants takes into consideration the balancing among the fit, comfort, function and esthetic. These new pants were evaluated by 3 older women with arthritis to finish five different daily living activities. The optimized pants can minimize the impact of arthritis, increasing the convenience of activities in daily life. This new design method can provide a new idea for apparel manufacturers and marketers to produce new products. At the same time, the design recommendations can be fit to the need of older people without arthritis.
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Session 5B – Consumers: Shopping

In-Store Shopping Behaviors of the Aging Population and Millennials: An Observational Study

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Keywords: Aging population, Millennials, Self/cashier checkouts, Consumer behavior

As older consumers go through various life phases, their needs, consumption experiences, perceptions, and responses to marketing stimuli are very likely to change (Moschis, 2003). However, many of these changes in shopping preferences have not been well studied. Underhill (1999) reported that the aging population has been marginalized in many respects especially in the retail world. In particular, it is important to understand how the characteristics of older consumers may influence their use of technology such as self-checkout machines, as well as the types of consumers that are prone to use of self-checkout machines (Lee et al., 2010). Research has also suggested that gender influences interaction with sales persons (Lee et al., 2010). Thus, this study aimed to investigate the shopping behaviors of aging consumers and millennials in a retail-shopping environment. Specific objectives were to evaluate the use of self-checkout machines, cashier checkouts, and interaction with sales representatives in the store.

An observational methodology was used to gather data by collecting information from unsuspecting customers in a grocery store. Potential consumers were selected based on convenience at the entrance of the store and their assumed ages. The selected consumers included 30 males and 30 female shoppers, with an equal proportion of millennials (approx. mean age of 25) and older shoppers (approx. mean age of 65). The selected shoppers were monitored throughout the store up to the time of checkout.

The results indicated that a greater percentage of the older shoppers (66.6%) engaged in more conversations with sales representatives than millennials (20.0%). Our findings revealed that the interactions people had were mostly about finding the location of products in the store, inquiring about products, cartwheel, and coupons. In addition, the older group usually asked sales representatives to help retrieve items on shelves, read captions on medicines and cosmetics, and pick up items from the bottom of large boxes located in the power aisle. Females, irrespective of age, also engaged in more conversations with sales representatives compared with their male counterparts. This result is consistent with Bruke’s (2002) study that found that women were more interested in all forms of assistance by sales persons when shopping.

Our findings also indicated that a greater proportion of the older group used cashier-assisted checkout lanes (70.0%) compared to younger consumers (46.7%). Dean (2008) stated that younger consumers are more likely to use self-checkout machines than older consumers. This may be as a result of older people tending to perceive a reduction in their own cognitive capabilities in the process of learning and therefore having lower perceptions of self-efficacy (Hertzog and Hultch, 2000). Lee et al.’s (2010) study also demonstrated that as age increases, technological anxiety increases.
This study provides insights about the behavior of older consumers compared to millennials in a retail space. It also provides a contextual framework to help understand the needs, experiences and consumer expectations of the aging population. Since our findings indicate that age significantly influences consumers’ use of checkout machines, with older consumers using cashier-assisted checkout lanes more often compared with self-checkout machines, it is important for retailers to pay closer attention to the needs of older consumers to improve their consumer experience. Retailers should attempt to reduce their technological anxiety when they target older consumers, and could provide a training program for consumers to help them perceive that using self-checkout machines is comfortable (Lee et al, 2010). Store employees should also provide personal assistance to help older customers with self-checkout machines. To increase older consumers’ intention to use self-checkout lanes, self-checkout machines should be designed in a way that is easier to operate such as customizable font sizes.

References
Response to Sales Promotion Techniques: Comparing the Young with the Aging Population

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Keywords: Aging population, Sales promotion, Baby boomer

Focusing on the aging population is becoming more important than ever for retailers and merchandisers, since the aging customer segment presents a growth opportunity for many industries (Le Serre, Legoherel, and Weber. 2013, 61). A previous study (Koubaa, Tabbane, and Hamauda. 2017, 99) indicates that the consumption behavior pattern of the aging population is far different from that of other age segments, due to the unique characteristics of senior consumers. Thus, the importance of continuous research on elderly customers cannot be underestimated.

Retailers and marketers use sales promotions to attract potential consumers and keep patrons (Sirgy, Grewal, and Mangleburg. 2000, 129). Much research on its effects is ongoing, and there is still a potential for a better understanding. Because a myriad of sales promotion tools exist, it is needed to sort out the criteria to analyze them effectively. This research adopted Applebaum’s (1951) classification of sales promotion techniques: displays, pricing, demonstrations, and sales talks. It was confirmed that the aging population is more sensitive to sales promotion techniques. When taking into account of the need for an in-depth understanding of different sales promotion techniques, it is influential to investigate how older population respond to each type of sales promotions.

This study aimed to investigate the difference in the response to the four types of sales promotion techniques between the aging population and the younger generation. In addition, the significance of this study comes from the fact it enabled to understand which groups of sales promotion techniques stimulate the aging population most and least. A total of 52 of the aging population and 52 of young adults were observed in multiple fashion stores. The frequency of the consumers’ response to each sales promotion was recorded. For a better understanding, such frequency was broken down into sub-categories of each sales promotion group. Data collected in the form of numbers was analyzed with z-test to determine if there is a significant difference in the response between two age groups.

Based on the result, the aging population was more sensitive to demonstrations and sales talks than the young generation. More specifically, the level of response varied depending on the sub-categories of each sales promotion technique. Most importantly, the aging population picked up the items in hard-to-see displays (z=2.57, p=.01), tended to check prices faster (z=2.84, p<.01), and tended to check product information more frequently (z=3.48, p=0) than the young. Figure 1 below shows the significantly different response rate between two age groups.
Findings of this study provide managerial implications for fashion marketers. Understanding shoppers’ response to different sales promotion techniques is essential, since it directly gives marketers a cue to persuade their target consumer segment. For example, the aging population is more susceptible to certain sales promotion techniques such as product information than the young generation. Considering this, it is beneficial for retailers to develop a marketing strategy focusing on more descriptive information about products when targeting the aging population segment to entice them effectively.

FIG 1.
DIFFERENT RESPONSE BETWEEN TWO AGE GROUPS

References


The Effect of Types of Store and Product Category on Time Spent in the Store Based on Gender and Age Differences

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Keywords: Senior, Gender, Store type, Product category

The proportion of the seniors in the U.S. population is predicted to increase more rapidly in the future (The United States Census Bureau, 2018). Seniors have unique characteristics and consumption pattern that suggest they may differ in their shopping behavior across retail settings of different store size and product categories. Seniors have unique characteristics in that have limited mobility and difficulty in navigating compared to non-seniors (Underhill, 2009). This led to the question of if big store size elicits polarized shopping experience for the seniors. Indeed, store size itself is one of the specified environmental variables in store atmospherics. Seniors are also known to have unique consumption pattern, allocating higher portion of their expenditure on basic needs such as housing, food, and healthcare than on non-necessities such as clothes, personal care, and housing equipment, which was more prominent feature among lower income seniors (Seonglim, Sohn, Rhee, & Lee, 2014). This led to the question of if seniors differ in their shopping behavior when shopping for groceries versus apparel. The dependent variable of interest was time spent in store, which reflects one of four aspects of approach behavior in Mehrabian and Russell’s response taxonomy, willingness to look around and explore the environment (Donovan & Rossiter, 1982).

In an attempt to provide guidance for the retailers, this study examines senior’s approach behavior, time spent in store, in retail setting of diverse sizes (large specialty store versus small sections in superstore) and product categories (food versus apparel). Additional variable of gender was examined given the previous studies on its relevance to shopping time (Hart et al. 2007). Thus, the research question was how seniors/non-seniors and males/females differ in their time spent shopping in large food/apparel specialty store versus small food/apparel sections in superstore.

A total of 116 participants of diverse age and gender were observed across 2 (different store types: large specialty store versus small sections in superstore) x 2 (product categories: food versus apparel) retail settings. Each store was chosen carefully to represent similar store size and product specialty. At each type of store, the time spent in the store or section was measured using a stopwatch. For small food or apparel section in superstore, time spent was measured starting from when the participants entered the section to when they left the section.

Randomization hypothesis test and bootstrapping confidence interval was used to analyze the data. The results show that the non-seniors do not show significant difference in the mean shopping time across these different store types. As for the seniors, they spent significantly more time shopping for groceries in specialty store than when in superstore, but their time spent shopping for apparel in superstore and specialty store did not differ significantly. This contradicts the previous notion that the seniors will avoid big stores due to their limited mobility. Instead, they are willing to venture out in the big specialty grocery store and take the time to carefully browse the food products. The difference in the mean shopping time between female and male was not significant for all retail settings except for the small grocery section in a superstore located in downtown,
implying that the women are not willing to compromise on their prudence in shopping even when in convenience shopping situation. Further detailed results and practical implications for the retailers are suggested in the main article.

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Session 6 -- Design Display

Creative Application of the “Chinese Tunic Suit” for the Elderly Chinese Citizen

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Keywords: Chinese tunic suit, Elderly, Clothing design

So far, more than seventy countries in the world, including China, have entered an aging society. This design research presents a series of fashionable clothing designs with Chinese characteristics. The Chinese tunic suit is basically characterized by a Prussian collar and four patch pockets with pocket flaps. On the basis of features of modern European and American clothing, the tunic suit combines characteristics of Japanese Gakuran and Chinese clothing. Sun Yat-sen, referred to as the “Fashion of the Nation” served as the first provisional president of the Republic of China and was credited for designing the Chinese tunic suit, also known as the Zhongshan suit, that includes Chinese aesthetic elements. It is a favored type of standard clothing among Chinese men.

Each design directly expresses innovation points, forms and concepts of clothing design through design drafts, design analysis and material clothing to lay a foundation for innovative design of clothing for the elderly. In this design, optimization of structure and function were retained by applying modeling elements and characteristics of the collar, top fly and pockets of the Chinese tunic suit. The detachable design allows the clothes to be regulated with changes in climate, so that it is a multi-wear coat for the elderly. The reflective stripe allows a person to be recognized easily at night and serves as a security warning to drivers. Anti-theft pockets ensure financial security. Due to the combination and functional design of bags, the coat can store objects and cell phones. In addition, due to the transparency of screen-cloth pockets, drugs can be placed in the bag in case of emergency.

Based on research on behavioral characteristics, aesthetic requirements and humanistic feelings of the aged, these designs used comfortable environmental cotton and linen materials to design a suit of clothes as a “human-clothing-environment” that involves holistic thought from the perspective of design science, sociology and ergonomics.
Accessories design:

- Mobile phone pocket, easy to pick and place.
- Built-in zippers, zipper heads were fixed with luminous hook and loop.
- String bags can be used to store standing drugs. Due to transparency of screen cloth, drugs can be discovered by other people easily in case of emergency.
- String bags on surface can be used to store common objects.
- Mobile phone pocket, easy to pick and place.
Outfit 03:

- Detachable muff design: the coat can be transformed into a vest, and the inner part can be changed with the climate change.
- Double layer reinforcement treatment.

The elastic waist of trousers can be used to seize and take off easily.

Reflective material for safety during walking at night.

Color of Fabrics:
Innovative Research on the Design of Middle-aged and Old-aged Folded Cheongsam

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Keywords: Word, Cheongsam, Fold, Design Innovation, Active Aging, Form

This paper analyses the main problems existing in the field of garment design for middle-aged and old people in China, and puts forward the product design concept of "active aging" through the design of folded cheongsam for middle-aged and old people. Yi Zhe, an original designer brand in Shanghai, and its design of folded cheongsam is taken as the case to analyse the innovative design of garment folding technology in middle-aged and old-aged garment design. According to the sales data of Yi Zhe's folded cheongsam series from 2017 to 2019 in the middle-aged and elderly women's wear market, the sales and popularity index of folded cheongsam has raised in the past five years, becoming one of the most satisfied clothing categories for middle-aged and elderly people. This article chooses the representative works of Yi Zhe brand folded cheongsam series for middle-aged and old people, and makes analysis on its design concept, design modelling, technical characteristics, cultural spirit, etc., to point out that the garment design works represented by folded cheongsam for middle-aged and old-aged people meet the needs of middle-aged and old-aged consumers at physiological, psychological, spiritual and cultural levels. This paper demonstrates this argument with the actual product design innovation results and market feedback data puts forward that product design innovation should respond to "fashion and active aging", and highlights the key role of the fashion industry in the issue of "active aging".

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Wander with the Clouds: Design Series for Middle-aged and Older men

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Keywords: Rejuvenation design, Modern senior citizens, Menswear

With the advent of an aging society, the needs of the senior citizens are getting more and more attention. Modern senior citizens’ pursuit of quality life is evident. Their demand of clothing is also shifting from the traditional basic functional needs of protection to the pursuit of taste and fashion\(^1\). It is the responsibility of the designer to design clothing products to meet their physical and psychological needs.

This series is a set of 4 business suits for middle-aged men. At present, business apparel targeting quinquagenarian on the market are mostly old-fashioned. How to design a garment with both mature taste and fashion sense? “Rejuvenating design” is the key to these problems and its development. But what we need to know is that “rejuvenation” is not simply a movement towards youth, but rather it should be placed in the context of modern culture: the middle-aged and older men are younger psychologically and spiritually compared to those in the past. Therefore, we must also adjust design so that it is in line with the development of the times.

In this design work, considering that the wearers of middle-aged and old-aged men pay more attention to the status symbol and cultural taste brought by the clothing, the designers should present a feel of “low-key and culturally rich” design. This design series is called “Wander with the Clouds” and its design is inspired by the “mountain and river water” in nature. The “blackish green” of the mountains and vegetation, the “greenish-green” of the river and sea stream constitute the main color of the design, decorated with the classical auspicious clouds, without losing its calmness when adding vitality. In terms of structure, it adopts the traditional Chinese “cross-shaped structure” cutting, adding a bit of casual and young texture based on maintaining the serious silhouette of the formal suit. The overall form of clothing aims to show a life attitude of self-sufficiency and casualness.

The designs concerning color, pattern, and silhouette display not only youthfulness, but also the rich spiritual pursuit and aesthetic taste of middle-aged and elderly people. Therefore, we advocate rejuvenation of design because it is a way to align with the youthful mindset of middle-aged and older people.

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Forward, A Mini-Collection for Women Aged 50+

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Keywords: Active aging, apparel, womenswear

Currently, American women aged 50+ are among the largest demographic to hold incomes over $100,000 (Goldston 2018). The purchasing power of older generations continues to grow, and it is been predicted that the baby boomer generation will inherit around $8 billion dollars in the next 20 years (Eschtruth et al. 2011). Aging American women are very active, and they continue to purchase new clothing. Many women continue to work past the typical retirement age, and many women in this cohort commonly attend social gatherings such as children’s graduations, weddings, and births of grandchildren. Based on literature, news articles, and personally conducted interviews, many of these actively aging women comment on feeling invisible when shopping. They frequently state that garments are not made, nor marketed towards women of their age group. This may be a reason that WGSN suggests that it is still possible to build new brand loyalty within this demographic (Craggs 2019). This mini-collection of four ensembles, shown below, attempts to provide this active aging market with clothing made specifically for their age group. The collection was built upon many conversations the designer had with potential clients where women shared that they face difficulty in finding new garments that are modern, flattering, and that do not age them further. These mix-and-match pieces are meant to be easily incorporated into a woman’s wardrobe. The designs are meant to reflect and honor the vitality, creativity, and activity of the actively aging woman.

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