

ASSESSMENT OF MEN'S TENNIS CLOTHING:
MOVEMENT AND AESTHETIC ANALYSIS

By

HEEJAE JIN

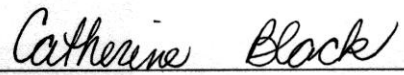
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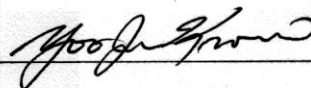
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ASSESSMENT OF MEN'S TENNIS CLOTHING:
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Abstract

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Tennis participation has increased 11% since 2000 as more people are concerned about their health. Although a higher percentage of men play tennis, there has been limited academic research on men's tennis clothing.

The purpose of this study is to identify the perceived functional, and aesthetic men's tennis clothing. A questionnaire was distributed to identify needs assessments of men's tennis clothing to participants.

The hypotheses in this study were tested to determine significant relationship among tennis commitment, satisfaction with tennis clothing, and interest in functional aesthetic tennis clothing. Also, the hypothesis was tested to determine if there is a significant correlation between satisfaction with functional components and satisfaction with aesthetic components of tennis garment by using Pearson correlation.

The results indicated that: 1) there was a significant positive relationship between level of tennis commitment and tennis clothing satisfaction; 2) there was a significant positive relationship between tennis commitment and interest in functional attractive clothing; and 3)

there was a significant positive correlation between satisfaction with functional components and satisfaction with aesthetic components of tennis garments.

This study found that needs assessment of men's tennis clothing for each tennis movement phase reported dissatisfaction with sleeve and crotch fit. Also, in the aspect of aesthetic, dissatisfaction with fashion, attractiveness, and color were reported. Respondents indicated their preferred tennis garment design for shirt type and shorts type. For shirt type, respondents preferred their T-shirt type with a round neckline, set-in sleeve, and hip length. The short style preferred was baggy shorts with an elastic only, and 2- inch waistband width.

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CHAPTER ONE

INTRODUCTION

Tennis participation has increased 11% since 2000 as more people are concerned about their health benefits, social interaction, and competition (Active Marketing Group [AMG], 2007). According to AMG (2007), 68% of sports players indicate tennis is their favorite sport, and tennis can be played by participants of all ages since tennis play is considered a “lifetime sport”. Tennis participants have a high level of education and affluence, also tennis is used to reach active consumers from both genders, as 52% of participants are male and 48% are female (AMG, 2007). These various reasons are why marketers regard tennis players, particularly male tennis players, as attractive customers.

Active sportswear, such as tennis clothing, must allow for movement (Porter, 1976). Even though sports clothing has to allow for ample movement to enhance athletic performance, sports players report they are not satisfied when their body movement is restricted by apparel (Watkins, 1977). Because sports players’ satisfaction with garments is adjusted by the movement demands of their sport (Watkins, 1977), the researcher of this thesis focuses on the satisfaction of players with tennis clothing as a movement analysis.

Wheat and Dickson (1999) indicate that aesthetic attributes are essential to the first decision for sale and overall success of a garment. Aesthetic characteristics of sports clothing is important, as is the need for enhancing physical performance. Thus, the aesthetic factors for the preferred clothing of male tennis players are also a focus of this study.

Based on the limited research, male tennis clothing needs to be designed for physical performance and aesthetic attractiveness. Therefore, specific garments for male tennis players will be assessed in this research study.

PURPOSE

The purpose of this study is five-fold: a) to assess satisfaction with fit and aesthetics of tennis clothing by level of tennis commitment b) to assess satisfaction with fit and comfort of tennis clothing by movement; c) to assess preference of garment features for men's tennis clothing; d) to assess interest in functional attractive appearance of tennis clothing of men tennis players; and e) to investigate the relationship between functional and aesthetic satisfaction of tennis garments for men players.

OBJECTIVES

Key objectives are to:

1. Identify a level of satisfaction for fit and aesthetics of tennis clothing;
2. Identify a level of satisfaction of tennis clothing based on body positions;
3. Identify a level of interest in functional attractive appearance of tennis clothing;
4. Identify a level preference of the aesthetic of tennis clothing; and
5. Investigate the relationship between functional satisfaction and the aesthetic satisfaction with tennis garments.

RATIONALE FOR THE STUDY

As the number of participants involved in sports increases, sport clothing has been a high-growth product for manufacturers and retailers (Feitelberg, 1996). However, there has been limited academic research on sport clothing, particularly tennis clothing. Moreover, the lack of literature on men's tennis clothing has made it difficult to investigate the need assessments for male players. Since a higher percentage of men play tennis than women, male tennis player will be the focus of this study. This research, therefore, will contribute to the limited academic research regarding tennis clothing and deepen the understanding of design for male's tennis clothing through needs assessment.

LIMITATIONS

Limitations for this study are that the sample purposely will be selected from three regional tennis clubs in northwestern United States. Thus, findings from this study may not be generalizable.

ASSUMPTIONS

Assumptions of the study include:

1. That male tennis players are able to recognize their clothing needs related to movement; and
2. That male tennis players want specific tennis garments.

DEFINITION OF TERMS

Aesthetic: To deal with the human desire for beauty as art elements, design principles, and body/garment relationships (Lamb & Kallal, 1992).

Commitment: “The level of priority given an activity” (Mitchka, Black, Heitmeyer, & Cloud, 2009, p. 32).

Fashion: “Timeliness of visual form of the apparel-body construct” (DeLong, 1987, p. 144).

Fit satisfaction: “The extent the consumer is satisfied with fit and selection of ready-to wear in her size” (Feather, Ford, & Herr, 1996, p. 23).

Functional sports clothing: Any sports apparel where task related or functions are emphasized over fashion or aesthetic functions (Black & Cloud, 2008).

Movement analysis: “Collect data by notating or recording body movement so that movement data from many participants can be compared and a complete cycle of movement can be charted” (Watkins, 1995, p. 226).

Need assessment: A tool to identify gaps between current products and required or desired products, places these gaps in priority order, and selects those gaps (needs) of the highest priority (English & Kaufman, 1975).

Performance enhancement: “Aspect of the uniform that enhance athletic performance” (Wheat & Dickson, 1999, p.7).

Preference aesthetic: “Aesthetic attributes related to style and shape” (Chataraman & Rudd, 2006, p. 48).

Style: “Popular in the present or a set of trends” (Brannon, 2005, p. 398).

CHAPTER TWO

REVIEW OF LITERATURE

The review of literature includes the design process model of functional design, commitment, movement analysis, needs assessment of sportswear, design for enhancement of the movement, and aesthetic design.

FUNCTIONAL DESIGN PROCESS

For development of functional garments, design process is used to address and analyze wearer needs. DeJonge (1984) proposes the design process to identify a needs assessment for improved functional clothing. The full design process includes seven stages: request made, which is making the project by designer; design situation explored, which is gathering information to understand the design problem and to identify user needs; problem structure perceived, which is to develop a design concept; specification described, which is to decide a range of solutions for solving the problem; design criteria established, which is to provide a solution; prototype development, which is making the project process; and design evaluation, which is to judge the project (Dejonge, 1984).

Black and Cloud (2008) follow the concept of the design process to identify a needs assessment for bicycle patrol officers. For improved bicycle patrol uniforms, police officers' needs are identified by stages two and three of the design process, and followed by identifying

criteria and specifications. For example, thermal discomfort and fit issues affecting mobility are identified by users, and re-design for bicycle patrol uniforms is proposed (Black & Cloud, 2008).

Fowler (2003) applies the functional design process as five steps to help identify ways of improving ballistic vests. The five steps were based on Dejonge's seven steps, including general request; exploration of the design situation; problem structure perceived; design specifications; and interaction of design criteria established (Fowler, 2003).

Mitchka et al. (2009) address three steps of the functional design process for adult female dance activewear. To investigate dance activewear expectations, it is framed in the first step of the Dejonge process. Also, the importance of dance activewear attributes is developed in the second step, and satisfaction with dance activewear garments of adult female dancers at different levels of dance commitment is assigned at the third step of the functional design process (Mitchka et al., 2009).

Watkins (1995) proposes the functional design process for application in selected research for specific needs. Various researches follow the concept of the functional design process – for example, police bicycle patrol uniforms (Black & Khan, 1995), a prototype of an athletic girdle (Walde-Armstrong, Branson, & Fair, 1996), an athletic ankle brace (Labat & Sokolowski, 1999), protective ice hockey equipment (Watkins, 1977), and clothing for the neonate (Bergen et al., 1996).

Lamb and Kallal (1992) propose the Functional, Expressive, and Aesthetic (FEA) Model as a conceptual framework for the study of consumer needs. The FEA model includes a six-step process that expands on the previous functional design process: problem identification; preliminary ideas; design refinement; prototype development; evaluation; and implementation.

Bye and Hakala (2005) use the FEA model integrated with the DeJonge (1984) design

process for designing a satisfying prototype garment for sailing. Sailors needs are identified through personal interviews and participant observation, and prototype designs for sailing garments are developed, such as the one-piece design in a female flattering silhouette, during the select and implement step of design process. In the evaluation step, functional, expressive, and aesthetic categories are then used to meet the final design (Bye & Hakala, 2005).

Holland (2007) performs a needs assessment of soccer uniforms by following the concept of the FEA model. The FEA design criteria for soccer uniforms include three categories: functional properties, such as thermal comfort and fit properties; expressive property, such as status property; and aesthetic property of art elements (Holland, 2007).

The design process can be applied to develop a needs assessment for functional clothing, such as military apparel, sports uniforms, and apparel for people with disabilities (Wakins, 1995). To identify a needs assessment for men's tennis clothing, this study follows the concept of FEA model.

COMMITMENT

Sports commitment is defined as a state of mind that represents aspiration to participate in a specific sport (Casper, Gray, & Stellino, 2007). Sports commitment is constructed by five determinants: (a) sport enjoyment as a positive affective response; (b) involvement alternatives as the attractiveness of other activities; (c) personal investments as personal resources such as time, effort, and energy; (d) social constraints as the social expectations or norms; and (e)

involvement opportunities as the anticipated benefits such as friendships and skill mastery (Weiss, Kimmel, & Smith, 2001).

In the study of the determinations of adult tennis players' participation frequency and purchase intention, Casper et al. (2007) indicate that the more committed tennis players play, the more they spend on tennis equipment. Similarly, Dickson and Pollack (2000) indicate that the level of commitment in inline skating includes five factors: frequency of play, happiness, priority over other activities, relaxation, and spending time and effort to become competent. The more committed skaters report spending more on skating clothing (Dickson & Pollack, 2000).

Female dance students of different commitment levels report different expectations for their dancewear, as dancers with higher levels of commitment are more interested in the attractiveness, style, design, and color of their garment (Mitchka, Black, Heiteyer, & Cloud, 2009).

MOVEMENT ANALYSIS

Movement analysis is to “collect data by notating or recording body movement so that movement data from many participants can be compared and a complete cycle of movement can be charted” (Watkins, 1995, p. 226). According to Brennan (1999), movement analysis involves what parts of the body are moving and how the movement is executed and can be applied to the form of movement, such as hitting a tennis ball. Also, Brennan (1999) suggests Laban Movement Analysis, which includes the study of the relationships between the body and its spatial environment and the functions for achieving efficient and integrated movement for analytic techniques in movement. This aspect of the Laban Movement Analysis “deal with such

concepts as spatial designs, the relationship between the limbs and torso in moving, and movement scales built on linear dimensions, planes or three dimensional forms” (Brennan, 1999, p. 288). DeLong (1987) indicates that body movement, such as raising the arms and bending, is affected by all aspects of clothing design as body movement interacts with and can be restricted by the materials on the body.

Ashdown (1989) proposed movement analysis for the study of protective coveralls – that is, each movement category, such as a reaching movement, a bending movement, and a kneeling movement, were chosen through videotape segments viewed repeatedly. These chosen movements were executed to find out how to design more fitting coveralls for the body.

Huck and Kim (1997) show that each range of motion (ROM), such as shoulder flexion and trunk flexion, is measured for developing a coverall for grass fire fighting. For example, to allow greater movements for the grass fire-fighters, the prototype coveralls incorporate stretch panels in the crotch area for upper leg flexion. To increase range of shoulder movement, the upper back also has stretch panels.

Choi and Ashdown (2002) classify working movements by movement analysis for female pear workers’ clothing. These working movements are classified into four body positions, such as looking upward with arms at 90° angles in a standing posture adopted by the pear farmers.

Observation Skill for Movement Analysis

Kreighbaum and Barthels (1985) indicate that human movement relates particularly to sport, dance, and adaptive activities in the analysis of human movement. In the aspect of a movement performance, they suggest “discrete skill” for observing skill that has a definite

beginning and end, such as a tennis serve, and in addition, has the variability among the performances. A discrete skill is divided into the preparation phase, which is a preparation for executing the actual movements, an execution phase, that results in the projection, and the recovery phase, which is the next body movement of the execution phase. In these movement performances, especially in sports, swing occurs in the diagonal motions, and they have peculiarities in the specific body part – for example, hip, shoulder, and elbow have flexion, extension, and hyperextension for the segment doing the moving (Kreighbaum & Barthels, 1985). Watkins (1995) suggests that participant observation in the analysis step is valuable for understanding the needs of the individual and efficiently reading the data collected.

Philip (1987) used observation skill to analyze movements of premature infants and critically ill full-term infants, and the result of movement analysis reported less muscle tone and lying in the extended position as opposed to the flexed position for the well full-term infants. Likewise, in this study, tennis participant observation for movement analysis was used to select movement phases for addressing participant needs.

NEEDS ASSESSMENT

English and Kaufman (1975) define a needs assessment as “a tool which formally harvests the gaps between current results (or outcomes, products) and required or desired results, places these gaps in priority order, and selects those gaps (needs) of the highest priority for action, usually through the implementation of a new or existing curriculum or management procedure” (p. 3). Stevens and Gillam (1998) suggest that user needs for a product or service may propose a new design model and needs assessment of participants may lead to advancement

of efficiency. For instance, Bergen, Capjack, Mcconnan, and Richards (1996) show that the need for specialized clothing for the neonate is identified by a director of a neonatal intensive care unit. Similarly, a needs assessment for functional clothing by bicycle patrol officers is used to guide the functional design process for improved bicycle patrol uniforms (Black & Cloud, 2008).

NEEDS ASSESSMENT OF SPORTSWEAR

Needs assessment for athletes' sport clothing concerns comfort to increase the effective performance of athletes (Mullet, 1996). Dickson and Pollack (2000) indicate that comfort is one of the needs assessment elements in sport clothing that is significant in enhancing effective physical performance. A fit assessment is also a significant needs assessment element for athletics. In fact, fit and comfort aspects have been named the two dominant aspects that influence satisfaction for sport clothing (Dickson & Pollack, 2000). Indeed, Chae, Black, and Heitmeyer (2006) also indicate that comfort and fit were the most important attributes when purchasing tennis clothing for tennis players.

The following hypothesis has been developed for this study:

H1) There is a significant relationship between level of tennis commitment and tennis wear satisfaction.

DESIGN FOR ENHANCEMENT OF THE MOVEMENT

Athletes need their sport clothing to enhance physical performance for them, so physical performance-enhancing characteristics are vital (Dickson & Pollack, 2000; Casselman-Dickson & Damhorst, 1993). Wheat and Dickson (1999) state that female golfers' clothing is made for optimal performance and ease of movement, such as shirts with knit material in the shoulders for elasticity and sufficient back length for an unrestrained swing. Also, they suggest a feminine fit and size because ill-fitting clothing that is large and bulky hinders physical performance.

Bye and Hakala (2005) report that many sailors demand sailing uniforms that enhanced their prompt movement in a confined space. Since a sailor can quickly change in position, sailing garments could have a fitting problem of restricting the mobility of the sailors -- for example, the armholes and necklines may be too large for physical performance on a boat. The researchers suggest sailing garments that afford easy movement, including a one-piece design that is nonrestrictive and a well-fitting bodice (Bye & Hakala, 2005).

Choi and Ashdown (2002) suggest that functional work clothing should allow ease of movement to improve work efficiency. Their work clothing is designed based on the needs assessment of respondents for increasing mobility and providing physical comfort; for example, the jackets for work clothing of female pear farmers are designed to allow free range of movement of the upper body as a linear silhouette.

Based on previous studies research question one was formulated:

Q1) What garment areas present issues for the selected movement phases?

DESIGN FOR AESTHETICS

Aesthetic aspects in dressing for sports are essential to contributing to the sport identity, as well as the physical performance-enhancing characteristics (Dickson & Pollack, 2000). Bye and Hakala (2005) report that aesthetic needs include appearance, style, and type of traditional garments. Female in-line skaters report that a unique and interesting appearance is attractive in uniforms for performance needs, rather than traditional garments having a long history (Dickson & Pollack, 2000). Casselman-Dickson and Damhorst (1993) indicate that female bicyclists are also interested in attractive cycling clothing as an expression of their cycling competence in the aesthetic aspect.

Wheat and Dickson (1999) suggest that aesthetic criteria are often addressed as a satisfaction with colors of attractiveness and styles of favorite garments. For characteristics influencing interest in collegiate female golf clothing, a factor analysis of golf uniforms is examined, and eight items are identified using the Comfortably Attractive Appearance scale. Aesthetic components are five of the items: comfortable uniforms; attractive uniforms; favorite style; fashionable colors; and colors I like to wear. Golf players reported rating the Comfortably Attractive Appearance of their uniforms as neutral which is neither agree nor disagree for comfortable and attractive uniform. However, they indicate that the more comfortable and attractive uniforms are rated, the more satisfaction with players uniforms increase (Wheat & Dickson, 1999).

Thus, hypothesis for this study is as follows:

H2) There is a significant positive correlation between level of tennis commitment and interest in functional attractive appearance of tennis garment.

AESTHETIC PREFERENCE

Chataraman and Rudd (2006) developed the Aesthetic Attribute Preference Scale to measure styling preferences of garment tops and bottoms. The results of aesthetic preference in clothing through research questions are addressed by the scale to have a relationship with an individual's body image, body cathexis, and body size (Chatarman & Rudd, 2006).

Feather et al. (1996) examine aesthetic preferences in female basketball uniforms by four specific features of the uniform jersey and the uniform shorts. The jersey design features include neckline, armholes, length, and bottom, and the short design features include style, vents, waistband width, and waistband style. The female basketball players' primary preference is a deep v-neckline, sleeveless, hip length, and a straight bottom for jersey and a baggy style, v-vents, 1- to 2-inch waistband with elastic drawstring for short.

Similarly, Eckman (1997) evaluates preferences for men's suits based on eight design elements of two levels: jacket silhouette (narrow/wide); jacket length (short/long); drop (high/low); neckline (without lapel/with lapel); jacket pattern (solid/plaid); pant silhouette (narrow/wide); jacket color (olive/blue); and pant color (olive/blue). For men's suit, respondents reported that design preferences of men are the traditional styles, such as narrow jacket and solid color (Eckman, 1997).

To examine the preference for aesthetic attributes in men's tennis clothing, the following research question is proposed:

Q2) What garment features do male tennis players prefer?

Garment features for tennis players may include design components of neckline, armhole, and style of waistband.

The following hypothesis has been developed for this study:

H3) There is a significant correlation between functional and aesthetic satisfaction with the tennis garment.

Chapter 3 addresses the methodology to analyze the hypotheses and research questions represented in this chapter.

CHAPTER THREE

METHODOLOGY

This study identified a needs assessment for men's tennis clothing, and the design components for performance enhancement were examined to vary on the movement phase. For the examination, subjects were selected purposely, and data collection was executed by using observation skill and survey.

CONCEPTUAL FRAMEWORK

To identify a needs assessment of men's tennis clothing, this study was using the Functional, Expressive, and Aesthetic (FEA) Consumer Needs Model by Lamb and Kallal (1992) (Figure 1). The researchers classify design criteria as functional, expressive, and aesthetic. The functional category considers utility of apparel as protection, thermal comfort, fit, and ease of movement. The functional consideration is identified with the demands of a use situation for developing a functional garment, such as exercise garments for a nonrestrictive full range of motion. The aesthetic category is the aspect of human desire with beauty. Aesthetic attributes relate to cultural standards of beauty, and the use of elements such as color, texture, and form. The expressive category is the aspect of dress that communicates about the wearer as values, roles, status, and self-esteem (Lamb & Kallal, 1992). This study focused on the Functional and Aesthetic of the FEA model for the satisfaction of tennis players. Functional aspects of the FEA

model that were focus in the current study are fit and movement. Aesthetic aspects of men's tennis clothing were addressed through their preferences.

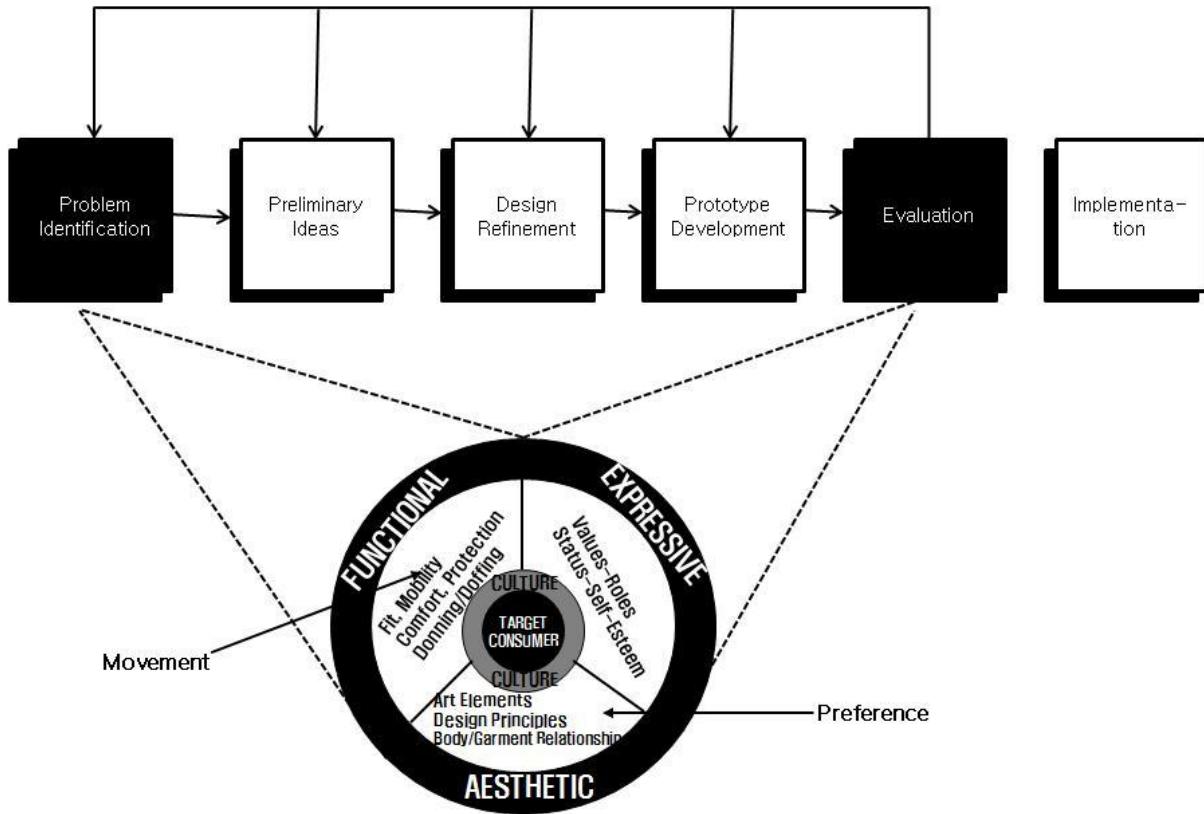


Figure 1. Functional, Expressive, and Aesthetic Consumer Needs Model

PRE-STUDY OBSERVATION

Based on interviews with tennis players who have played tennis for more than five years, it was determined that tennis play movements would be classified into three positions. Additional observations were conducted of men playing tennis including serving the tennis ball, backswing, and smashing the ball to determine the selected movement phases. Based on personal communication with Jeff Neaman, University of Idaho tennis coach, the three positions were identified as most likely to have more clothing body interaction. After assuming each of three postures, the subjects responded by Satisfaction of Garment Types Scale (Black, 1988) for functional components. As part of the pilot phase the questionnaire was reviewed for interpretability, length of time to complete, and appropriateness of tennis terminology.

SAMPLE AND DATA COLLECTION

Tennis players enrolled at tennis clubs in northwest United States for more than one year were asked to participate in this study. Subjects were surveyed to determine needs assessment of men's tennis clothing. An e-mail requesting permission to conduct the survey was sent to the coaches of these tennis clubs. After receiving university permission, a survey station was set up and volunteers were asked to complete the questionnaire. Questionnaires were collected and then analyzed.

INSTRUMENT

The questionnaire was developed based on previous needs assessment research (Mitchka et al., 2009; Holland, 2007; Dickson & Pollack, 2000; Wheat & Dickson, 1999; Chae et al., 2006). To identify a needs assessment of men tennis clothing the questionnaire is composed of tennis commitment, tennis clothing satisfaction, clothing needs by movement phase, and preference of aesthetic character of tennis clothing, as well as demographic information.

For measurement of respondent levels of participation, questions 1-3 were presented. Questions 4-9 measured the level of tennis commitment of the players as modified from the Commitment Scale based on Dickson and Pollack's (2000) research to assess in-line skating, reporting a reliability of 0.88. In this study for the level of tennis commitment of the tennis players, a high reliability score of 0.73 was found.

Reliability scores of the Comfortably Attractive Appearance (CAA) Scale using a five-point Likert-type scale was 0.91, and this scale was applied to questions 10-17. Using the CAA scale, questions 10-17 measured interest in functional attractive tennis clothing with a reliability score of 0.83 in this study.

Questions 18-35 were derived from prior research (Black, 1988; Holland, 2007; Sindicich, 2008) to identify problems of tennis garments by each movement phase. Questions 36-47 assessed the satisfaction of tennis clothing by the satisfaction scale by Yoo, Khan, and Black (1999), with a reliability score of 0.92. A reliability of the satisfaction of tennis clothing in this study was 0.86.

Questions 48-54 measured preference aesthetic attributes of tennis garments by players based on the Uniform Design Preference work of Feather et al. (1996). And finally, questions 55-58 were demographic questions to describe the characteristics of the subjects.

DATA ANALYSIS

Data analysis was based on the returned valid questionnaires of subjects. The data was analyzed using SPSS. Frequency analysis was used for descriptive statistics. Also, Pearson Product Movement Correlation was used to test relationships among the variables.

Hypothesis 1 was tested with Pearson Product Movement Correlation to identify significant relationship between level of tennis commitment and satisfaction of tennis garment. Also, Pearson Product Movement Correlation was used for hypothesis two and three. Frequency distributions were used for research question one and two as determination of improved tennis clothing. In the final section, demographic characteristics of subjects were described by frequency distributions as well.

CHAPTER FOUR

FINDINGS AND DISCUSSION

The purpose of this study is five-fold: a) to assess satisfaction with fit and aesthetics of tennis clothing by level of tennis commitment b) to assess satisfaction with fit and comfort of tennis clothing by movement; c) to assess preference of garment features for men's tennis clothing; d) to assess interest in functional attractive appearance of tennis clothing of men tennis players; and e) to investigate the relationship between functional and aesthetic satisfaction of tennis garments for men players.

This chapter will describe findings of this study, and discuss how the finding supported previous research. The results of data analysis include a description of sample demographic data and analysis of questionnaire responses related to the proposed hypotheses. The questionnaire was used to measure level of commitment, functional and aesthetic satisfaction of tennis clothing, and perceived clothing needs by movement. Also, preference of garment features for male tennis players will be analyzed through frequency distributions.

DESCRIPTION OF SAMPLE

The sample comprised men who participate at three tennis clubs in the northwest region of the United States. After approval from the Institutional Review Board (IRB), questionnaires

were distributed. Participants received questionnaire in February 2010, and 74 (74%) of the 100 questionnaires were returned.

DEMOGRAPHIC CHARACTERISTICS

The demographic characteristics observed in this study are age, ethnicity, height, weight, years of playing tennis, and hours per week of playing tennis.

Age

The respondents ranged in age from 19 to 32 years (Table 1). The mean age of respondents was 22.1 years. The largest percentage of tennis players was between 19 and 21 years of age (37.8 %, n= 28), with 21 to 23 years of age (25.7%, n=19) representing more than 60% of the subjects.

Table 1. Age of the Participants

		Frequency	Percent	M
		<i>f</i>	%	
Age	19-21	28	37.8	
	21-23	19	25.7	
	23-25	14	18.9	
	25-27	3	4.1	
	27 or more	10	13.5	
	Total	74	100.0	22.1

Ethnicity

The largest ethnic group of the respondents was Caucasian (62.2%, n= 46) (Table 2). Also, represented in this study were Asians at just under 30%, Hispanics, and African-American.

Table 2. Ethnicity Distribution of the Participants

		Frequency	Percent
		<i>F</i>	%
Ethnicity	Caucasian	46	62.2
	Asian	20	27.0
	Hispanic	5	6.8
	African-American	1	1.4
	Other	2	2.7
	Total	74	100.0

Height and Weight

The height of the respondents ranged from 5'4" to 6'5" (Table 3). The mean height was 5'10". More than 70% of the respondents indicated their height as between 5'9" and 6'2". The weight of the tennis players ranged from 130 to 200 lbs with a mean weight of 170.6 lbs (Table 4). More than 50% of the respondents indicated their weight as between 146 and 175 lbs.

Table 3. Height Distribution of the Participants

		Frequency	Percent	M
		<i>F</i>	%	
Height	5'4"-5'5"	2	2.7	
	5'6"-5'8"	15	20.3	
	5'9"-5'11"	27	36.5	
	6'0"-6'2"	26	35.1	
	6'3"-6'5"	4	5.4	
	Total	74	100.0	5'10"

Table 4. Weight Distribution of the Participants

		Frequency	Percent	M
		<i>f</i>	%	
Weight in Pounds	130-145	7	9.5	
	146-160	22	29.7	
	161-175	20	27.0	
	176-190	16	21.6	
	191-200	9	13.2	
	Total	74	100.0	170.6

Years Playing Tennis

The largest percentage of participants indicated playing tennis from 1 to 5 years (37.8%, n= 28), followed by 6 to 10 years (32.4%, n=24) (Table 5). The average years for playing tennis reported was 8.3 years. More than 50% of the respondents reported participating in tennis between 6 and 15years.

Table 5. Number of Years of Participating in Tennis

		Frequency	Percent	M
		<i>f</i>	%	
Years	1-5	27	37.8	
	6-10	24	32.4	
	11-15	17	23.0	
	16 or more	5	6.8	
	Total	74	100.0	8.32

Hours per Week Playing Tennis

Hours per week plying tennis ranged from one hour to 20 hours (Table 6). The largest group of respondents participated between 1 to 5 hours (47.3%, n= 35) per week. The average hours per week for playing tennis reported was 8.7 hours (Table 6). Between 6 to 20 hours per week of tennis play showed to be evenly distributed part 5 hours (each 17.6%) in this study .

Table 6. Number of Hours per Week of Participating in Tennis

		Frequency	Percent	M
		<i>f</i>	%	
Hours per week	1-5	35	47.3	
	6-10	13	17.6	
	11-15	13	17.6	
	16-20	13	17.6	
	Total	74	100.0	8.76

ASSESSING TENNIS COMMITMENT

The respondents were asked to assess their tennis commitment by responding to six tennis commitment statements (Dickson & Pollack, 2000). Each statement was measured on a five- point scale ranging from 1 (Strongly disagree) to 5 (Strongly agree) (Table 7). The total possible score range was from 6 to 30 for level of commitment. In this study, actual subject scores ranged from 8 to 30 (Table 8). Overall, more than 60% of subjects reported high scores of level of tennis commitment as between 20 and 30.

SATISFACTION OF MEN'S TENNIS GARMENT

Garment satisfaction was assessed, scores ranged from 12 to 60. Subjects ranged from 15 to 60 indicating that the men had a wide range in clothing interest (Table 9). The largest percentage of respondents (51.5%) reported score of satisfaction with tennis clothing between 38 to 48. This score range represented a consumer that was somewhat satisfied with current market place.

Overall, while respondents were satisfied with comfort, brand, fabric, and quality of their tennis clothing, some respondents were less satisfied with attractiveness, fashion, style, and size choices of the tennis clothing (Table 10). One respondent commented about men's tennis clothing in the aspect of fashion and attractiveness: "[We] want more fashionable clothing A lot of tennis pants have wide strips on the side which makes it [sic] unattractive. It would be

Table 7. Tennis Commitment

	Disagree		Neutral		Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Working hard to become a good player	5	6.8	13	17.6	56	75.7
Attending tennis classes frequently	21	28.4	11	14.9	42	56.7
Prioritizing playing tennis	11	14.9	15	20.3	48	64.8
Enjoying playing tennis	7	9.5	14	18.9	53	71.6
Playing tennis even when busy	12	16.2	19	25.7	43	58.1
Forcing oneself to play	51	68.9	9	12.2	14	18.9

Table 8. Overall of Level of Tennis Commitment

		Frequency	Percent
		<i>f</i>	%
Tennis Commitment	8-13	5	6.8
	14-19	21	28.4
	20-25	30	40.5
	25-30	18	24.3
	Total	74	100.0

Table 9. Overall of Satisfaction with Tennis Clothing

		Frequency	Percent
		<i>f</i>	%
Tennis Clothing	15-26	2	2.7
	27-37	7	9.5
	38-48	38	51.4
	49-60	27	36.5
	Total	74	100.0

Table 10. Satisfaction with Tennis Clothing

	Disagree		Neutral		Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Style	8	10.8	12	16.2	54	73.0
Fashion	11	14.9	17	23.0	46	62.2
Color	7	9.5	20	27.0	47	63.0
Fit	7	9.5	16	21.6	51	68.9
Attractiveness	12	16.2	16	21.6	46	62.2
Comfort	3	4.1	12	16.2	59	79.7
Size	8	10.8	19	25.7	47	63.5
Brand	6	8.1	11	14.9	57	77.0
Quality	6	8.1	12	16.2	56	75.7
Fabric	6	8.1	9	12.2	59	79.7
Fiber	7	9.5	14	18.9	53	71.6
Pleasing to others	4	5.4	22	29.7	48	64.8

better if the tennis clothing would be more casual, stylish looking.” In the study by Wheat and Dickson (1999) color and style were mentioned frequently as the aesthetic criteria. This is similar to fashion, attractiveness and style identified by the respondents in this study. Dissatisfaction with size of tennis garments was reported by a substantial number of respondents. This correlated with the results of Chae et al. (2006) that women tennis players were dissatisfied with lack of size of their tennis clothing. Holland (2007) also repeated that the highest rating of dissatisfaction with the lack of size assortment (40%) in soccer wear.

DISCUSSION AND SUMMARY OF RESEARCH QUESTIONS

Research Question 1. What garment areas present issues for a selected movement phase?

Respondents were asked to indicate their satisfaction with the fit of specific garment areas for three selected movement phases: 1) serving a tennis ball, 2) backswing stroke position, 3) and smashing a ball. The participants assessed satisfaction with areas of fit by circling options of ‘too small/short’, ‘too large/long’, and ‘appropriate’. When serving a ball, respondents indicated dissatisfaction with sleeve fullness (too small, 10.8%; too large, 14.9%), followed by the amount fabric on the shoulder (too small, 13.5%; too large, 9.5%) (Table 11). Dissatisfaction with the amount fabric on the shoulder was also reported for backswing stroke position (23%, n=17).

Table 11. Fit Issues for Selected Movement Phase of Tennis Garment

	Too Small/ Short		Too Large/ Long		Total Dissatisfaction	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
<u>Serving the tennis ball</u>						
Neck size	3	4.1	2	2.7	5	6.8
The amount fabric on the shoulder	10	13.5	7	9.5	17	23.0
Sleeve fullness	8	10.8	11	14.9	19	25.7
Crotch length	8	10.8	6	8.1	14	18.9
Pant Waist	7	9.5	2	2.7	9	12.2
Pants in the legs fullness	6	8.1	3	4.1	9	12.2
<u>Stroke Position(Backswing)</u>						
Neck size	4	5.4	3	4.1	7	9.5
The amount fabric on the shoulder	10	13.5	7	9.5	17	23.0
Sleeve fullness	5	6.8	8	10.8	13	17.6
Crotch length	6	8.1	4	5.4	10	13.5
Pant Waist	5	6.8	4	5.4	9	12.2
Pants in the legs fullness	6	8.1	3	4.1	9	12.2
<u>Smashing the ball</u>						
Neck size	6	8.1	3	4.1	9	12.2
The amount fabric on the shoulder	11	14.9	6	8.1	17	23.0
Sleeve fullness	6	8.1	6	8.1	12	16.2
Crotch length	9	12.2	4	5.4	13	17.6
Pant Waist	7	9.5	0	0	7	9.5
Pants in the legs fullness	8	10.8	4	5.4	12	16.2

Similarly, for smashing the ball phase, “the amount fabric on the shoulder” was the most dissatisfactory aspect reported by respondents (23%, n=17).

For each phase, respondents indicated comparatively higher level of fit problem for sleeve fullness and the amount fabric on the shoulder. Particularly, sleeve fullness for serving tennis ball was the highest dissatisfaction score (25.7%, n=19) at sleeve fullness problem of three movement phases. Fitting issues related to sleeve part were reported by previous literatures. For example, Chae et al. (2002) reported dissatisfaction with sleeve length (17%) and sleeve circumference (25%) for women’s tennis wear. Holland (2007) also found that sleeve length (45.6%) and sleeve fullness (35.1%) were the highest dissatisfaction rating for soccer uniforms. In this study, crotch length was one of the three highest dissatisfaction rating of each movement phase. Previous research have reported that crotch length was a specific problem for activewear shorts. For instance, crotch length was reported by 51.8% of soccer players as dissatisfaction with soccer shorts. (Holland, 2007). Also, crotch length of pants/leggings of dance practice wear was the highest dissatisfaction scores by both non-dance (41%) major and dance major (51%) (Turk, 2002).

Level of dissatisfaction with specific areas for each movement phase in this study relates to fitting issues of top and bottom tennis garments, such as sleeve fullness and crotch length. Comparatively, sixty six percent of golf players also reported dissatisfaction with the fit (Wheat & Dickson, 1999), and Turk (2002) found that fit was one of the most essential elements determining level of satisfaction with dance practicewear. Therefore, the findings of dissatisfaction with specific arears garment in this study indicate the need to improved fit for each enhanced movement.

Research Question 2. What garment features do male tennis players prefer?

The respondents were asked to select their preferred tennis garment design. For shirt type, a greater percentage (73%, n=54) of men tennis players preferred T-shirt type (Table 12). The majority of men tennis players preferred their T-shirt type with a round neckline (82.5%, n=61), set-in sleeve (48.6%, n=36), and hip length (60.8%, n=45). The shorts style preferred among men tennis players was a baggy shorts (78.4%, n=58). For shorts design features, players preferred shorts with an elastic only (52.7%, n=39), and followed by elastic draw string (40.5%, n=30). Also, players indicated a preference for 2 inches waistband width (52.4%, n=38), while 43.2% of the players reported 1 inch as their most preferred waistband width. Comparatively, in the study by Feather et al. (1996), design preferences of basketball players were jerseys with v-neckline, sleeveless, and hip length. Also, for shorts of basketball uniforms, baggy shorts as design preference was similar to the finding in this study.

TESTING OF HYPOTHESES

Three hypotheses were tested by using Pearson Correlation coefficients in this study. Hypothesis 1 was tested to determine if there is a significant correlation between level of commitment and tennis garment satisfaction by using Pearson Correlation. For hypothesis 2, Pearson Correlation was also used to test relationship between tennis commitment and interest in functional attractive appearance of tennis garment. Hypothesis 3 was tested using Pearson Correlation to determine if there is a significant positive relationship between functional and aesthetic satisfaction with the tennis garment.

Table 12. Design Preferences by Men Tennis Players

	<i>f</i>	%
<u>Shirt Type</u>		
T-shirt	55	74.4
Polo	19	25.7
<u>Neckline</u>		
Round	61	82.5
V-neckline	13	17.6
<u>Armhole Type</u>		
Se-in	36	48.6
Raglan	36	33.8
Sleeveless	13	17.6
<u>Shirt Length Type</u>		
Hip length	45	60.8
High-hip	21	28.4
Long	8	10.8
<u>Short Style</u>		
Baggy shorts	58	78.4
Dress shorts	15	20.3
Bike shorts	1	1.4

Table 12 (cont'd) Design Preferences of Men Tennis Players

	<i>f</i>	%
<u>Waistband Style</u>		
Elastic only	39	52.7
Elastic draw and string	30	40.5
Fly front	5	6.8
<u>Waistband width</u>		
2 inches	38	52.4
1 inch	32	43.2
3 inches	4	5.4

Hypothesis 1. There is a significant relationship between level of tennis commitment and tennis wear satisfaction.

Responses of six selected tennis commitment statements to assess level of commitment were summed. The scores of satisfaction of tennis garments were also provided for using Pearson correlation. Based on Pearson correlation result ($r = .424^{**}$, $p < .01$), there was a significant positive relationship between level of tennis commitment and tennis wear satisfaction (Table 13). In other words, as level of tennis involvement increased, satisfaction with tennis garments also increased. This positive relationship is supported by the significant correlation of commitment tennis and satisfaction with women tennis wear found in Chae et al.'s research (2006). Holland (2007) also found that there was a significant positive correlation between the level of soccer commitment and satisfaction with soccer uniforms. Therefore, hypothesis 1 was supported. Overall, the acceptance of hypothesis 1 gives direction for future design development as players, who highly involve with tennis, could suggest to conduct design of tennis garments for user satisfaction.

Hypothesis 2. There is a significant positive correlation between level of tennis commitment and interest in functional attractive appearance of tennis garment.

Based on characteristics of golf uniforms (Wheat & Dickson, 1999), responses of eight selected characteristics of uniform statements to assess interest in functional attractive appearance of tennis garment were summed. Pearson Correlation was used to test the relationship between level of tennis commitment and interest in functional attractive tennis

Table 13. Correlation of Tennis Commitment and Tennis garment satisfaction

		Tennis Commitment	Tennis Garment Satisfaction
Tennis Commitment	Pearson Correlation	1	.424**
	Sig. (2-tailed)		.000
	N	74	74
Tennis Garment Satisfaction	Pearson Correlation	.424**	1
	Sig. (2-tailed)	.000	
	N	74	74

** . Correlation is significant at the 0.01 level (2-tailed).

clothing. The result indicated that there is a significant positive relationship between tennis commitment and interest in functional attractive clothing ($r = .473^{**}$, $p < .01$) (Table 14).

Therefore, when tennis players are highly involved with tennis, they showed a higher degree of functional attractive tennis clothing interest. In the study on dance students by Mitchka et al. (2009), the findings indicated that a high level of commitment is correlated to enhanced physical appearance wearing and wearing fashionable dancewear. This correlated with the finding in this study that there is a positive relationship between tennis player commitment and interest in functional attractive appearance of tennis garment. Therefore, hypothesis 2 was supported. Hypothesis 2 findings suggest that retailers and manufacturers need to consider what is available in the clothing market for people with high level of tennis commitment.

Hypothesis 3. There is a significant correlation between functional and aesthetic satisfaction with tennis garment.

Using twelve criteria items, the men tennis players were asked to assess the degree of satisfaction with tennis garment. Factor analysis was used to identify the principle components of the twelve items describing with satisfaction for tennis garment. After the factor analysis was conducted, the two components, functional and aesthetic, were extracted from the twelve items. Aesthetic components as component 1 include style, fashion, color, attractiveness, brand, quality, fabric, fiber, and pleasing to others. In this study, Cronbach's alpha represented reliability was 0.94, and "% of variance" of aesthetic factor was 68.0% (Table 15). Functional components as

Table 14. Correlation of Tennis Commitment and Functional Attractive Tennis Clothing Interest

		Tennis Commitment	Functional Attractive Tennis Clothing Interest
Tennis Commitment	Pearson Correlation	1	.473**
	Sig. (2-tailed)		.000
	N	74	74
Functional Attractive Tennis Clothing Interest	Pearson Correlation	.473**	1
	Sig. (2-tailed)	.000	
	N	74	74

** . Correlation is significant at the 0.01 level (2-tailed).

Table 15. Aesthetic Component Matrix^a

	Component 1	% of Variance	Cronbach's alpha
Style	.858		
Fashion	.870		
Color	.775		
Attractiveness	.848		
Brand	.688		
Quality	.862		
Fabric	.859		
Fiber	.809		
Pleasing to Others	.836		
		68.08%	.94

component 2 include fit, comfort, and size. Cronbach's alpha of Functional factor was 0.85, and “% of variance” was 78.0% (Table 16). Pearson Correlation was used to test relationship between functional satisfaction with tennis garment and aesthetic satisfaction with tennis garment. The finding in this study indicated that there is a significant positive correlation between satisfaction of functional components and satisfaction of aesthetic components ($r = .674^{**}$, $p < .01$) (Table 17). In other words, for men tennis players, the more functional satisfaction with tennis garment increases, the more aesthetic satisfaction with tennis garments increases. This finding is supported by Holland (2007) who found a significant positive relationship between satisfaction of functional components and aesthetic components of soccer uniforms. Turk (2002) also found positive correlation between satisfaction with aesthetic, fit, and comfort for dance wear. Overall, as hypothesis 3 was supported, functional components and aesthetic components were indicated as important criteria for design improvements.

Table 16. Functional Component Matrix^a

	Component	% of variance	Cronbach's alpha
	1		
Fit	.848		
Comfort	.925		
Size	.876		
		78.08%	.85

Table 17. Correlation of Satisfaction with Functional and Aesthetic

		Functional Satisfaction	Aesthetic Satisfaction
Functional Satisfaction	Pearson Correlation	1	.674**
	Sig. (2-tailed)		.000
	N	74	74
Aesthetic Satisfaction	Pearson Correlation	.674**	1
	Sig. (2-tailed)	.000	
	N	74	74

** . Correlation is significant at the 0.01 level (2-tailed).

CHAPTER FIVE

SUMMARY AND RECOMMENDATIONS

The purpose of this study is to identify the perceived functional needs, and aesthetic clothing needs and preferences of men's tennis clothing. To identify needs assessment of men's tennis clothing, this study used the Functional and Aesthetic of the FEA model for the assessment of tennis clothing satisfaction. This chapter will summarize the results, and offer suggestions for future research.

SUMMARY OF THE STUDY

To identify a needs assessment and preferences of men's tennis clothing the questionnaire is composed of tennis commitment, tennis clothing satisfaction, clothing needs by movement phase, and preference of aesthetic character of tennis clothing, as well as demographic information. The questionnaire was analyzed to test the hypotheses and identify the research questions. Pearson Correlations were used to test significant correlations between 1) level of tennis commitment and satisfaction of tennis garment; 2) level of tennis commitment and interest in functional aesthetic tennis garment. In addition, the relationship between functional and aesthetic components of men's tennis garment was analyzed using Pearson Correlations. Frequency distributions were used to identify preferences of men's clothing design, and describe the sample of demographics.

SUMMARY OF FINDINGS

The majority of respondents were Caucasian (62.2%), and the mean age of the respondents was 22 years. Their mean height was 5'10", and the mean weight of the respondents was 170.6 pounds. Average years of tennis participation was 8 years, and average hours of tennis participants per week was 8.7 hours.

In this study, level of tennis commitment of male tennis players was identified. Respondents reported "working hard to become a good player" as a high level of tennis commitment (75.7%). While the respondents indicated "enjoying playing tennis" as the higher percentage of level of commitment (71%), contrasted with "forcing oneself to play" which merely received 18% agreement. This finding showed that respondents are more involved in enjoying play tennis than forcing to oneself to play.

Objective 2 of this study was to identify a level of satisfaction for fit and aesthetics of men's tennis clothing. For aesthetic, dissatisfaction with attractiveness, fashion, size, and style were the four highest dissatisfaction percentage scores for tennis clothing of respondents. Hypothesis 1 was supported as there was a significant positive relationship between tennis commitment and satisfaction with tennis garments. When the level of tennis commitment increased, satisfaction with tennis clothing of respondents also increased.

Objective 3 of this study was to identify a level of tennis clothing satisfaction based on body positions. Respondents indicated satisfaction with specific garment areas for 3 selected movement phases, which are "serving the tennis ball", "backswing stroke position", and "smashing the ball". For each movement phase, the three highest dissatisfaction ratings were reported for "Sleeve fullness", "The amount fabric on your shoulder", and "Crotch length".

Particularly, for “serving the tennis ball phase”, “Sleeve fullness” was the highest dissatisfaction rating. Dissatisfaction with “The amount fabric on the shoulder” was also reported both for “backswing stroke position” and “smashing the ball” with the highest rating.

Objective 4 of this study was to identify a level of interest in functional attractive appearance of tennis clothing. Hypothesis 2 was supported as there was a significant positive relationship between tennis commitment and interest in functional attractive tennis clothing. The higher the tennis commitment, the more respondents were interested in their functional attractive tennis clothing.

Objective 5 of this study was to identify aesthetic preference of tennis clothing. For shirt type, the majority of respondents preferred T-shirt type with a round neckline, set in sleeve, and hip length. For shorts type, respondents preferred a baggy shorts with an “elastic only”, and “2 inches waistband width”.

Objective 6 of this study was to investigate the relationship between functional satisfaction and aesthetic satisfaction with tennis garments. Hypothesis 3 was supported as there was a significant positive correlation between functional satisfaction and aesthetic satisfaction with the tennis garment. For men tennis players in this study, the higher the satisfaction of functional components, such as fit and comfort, the higher satisfaction of aesthetic components, such as fashion, style, and color.

RECOMMENDATIONS

The following suggestions are for apparel manufacturers and designers:

1. Designers need to improve fit of sleeve part and crotch part for enhanced movement.

2. Designers need to recognize men tennis players' preferred tennis garment design of men tennis players in this study.
3. Manufacturers need to consider fashion, attractiveness, and color of tennis garment for men tennis players.
4. Manufacturers need to produce diverse size assortment for men tennis players.

The following suggestions are for future research:

1. The sample could be expanded to include players from more diverse regions.
2. This study could be compare with needs assessment of women's tennis garment in aspects of functional and aesthetics.
3. A prototype could be developed to improve movement for men tennis garment. For instance, sleeve fullness for serving the tennis ball could be improved to address the sleeve fit issue in the prototype.
4. Evaluation for improved prototype could be executed by using three-dimensional body scanner for tennis movement phases.

APPENDIX A
RESEARCH APPROVAL LETTER

MEMORANDUM

TO: Catherine Black and Heejae Jin,

FROM: Patrick Conner, Office of Research Assurances (3005)

DATE: 1/4/2010

SUBJECT: Certification of Exemption, IRB Number 11199

Based on the Exemption Determination Application submitted for the study titled "Needs Assessment of Men's Tennis Clothing: Movement and Aesthetic Analysis," and assigned IRB # 11199, the WSU Institutional Review Board has determined that the study satisfies the criteria for Exempt Research at 45 CFR 46.101(b)(2).

This study may be conducted according to the protocol described in the Application without further review by the IRB.

It is important to note that certification of exemption is NOT approval by the IRB. You may not include the statement that the WSU IRB has reviewed and approved the study for human subject participation. Remove all statements of IRB Approval and IRB contact information from study materials that will be disseminated to participants.

This certification is valid only for the study protocol as it was submitted to the IRB. Studies certified as Exempt are not subject to continuing review (this Certification does not expire). If any changes are made to the study protocol, you must submit the changes to the IRB for determination that the study remains Exempt before implementing the changes (The Request for Amendment form is available online at http://www.irb.wsu.edu/documents/forms/rtf/Amendment_Request.rtf).

Exempt certification does NOT relieve the investigator from the responsibility of providing continuing attention to protection of human subjects participating in the study and adherence to ethical standards for research involving human participants.

In accordance with WSU Business Policies and Procedures Manual (BPPM), this Certification of Exemption, a copy of the Exemption Determination Application identified by this certification and all materials related to data collection, analysis or reporting must be retained by the Principal Investigator for THREE (3) years following completion of the project (BPPM 90.01).

Washington State University is covered under Human Subjects Assurance Number

FWA00002946 which is on file with the Office for Human Research Protections (OHRP).

Review Type: New

Review Category: Exempt

Date Received: 12/28/2009

Exemption Category: 45 CFR 46.101 (b)(2)

OGRD No.: N/A

Funding Agency: N/A

APPENDIX B
QUESTIONNAIRE

ASSESSMENT OF MEN'S TENNIS CLOTHING QUESTIONNAIRE

Please fill in the following information that best applies you.

1. How many years have you been playing tennis? () years
2. Approximately how many hours per week do you play or practice tennis? () hours
3. I have participated on the following types of tennis teams: Check all that apply
 Indoor School Community Recreation Club Other

The number that best represents you (Circle).

	Strongly disagree		strongly agree		
4. I work hard to become a more good tennis player.	1	2	3	4	5
5. I attend tennis classes frequently.	1	2	3	4	5
6. I give playing tennis higher priority than other activities.	1	2	3	4	5
7. I enjoy attending tennis classes.	1	2	3	4	5
8. Even when my life is very busy I find time to play tennis.	1	2	3	4	5
9. I have to force myself to play tennis.	1	2	3	4	5

Identify that best describes your tennis clothing (Circle).

	Strongly disagree		strongly agree		
10. My tennis wear is in styles I like.	1	2	3	4	5
11. My tennis clothing is comfortable to wear.	1	2	3	4	5
12. My tennis clothing is in colors I like to wear.	1	2	3	4	5
13. My tennis clothing is attractive.	1	2	3	4	5
14. My tennis wear has enough pockets.	1	2	3	4	5
15. My tennis clothing is in fashionable colors.	1	2	3	4	5
16. My tennis clothing allows me to move freely.	1	2	3	4	5
17. My tennis clothing enhances my performance as a tennis player.	1	2	3	4	5

When you are in Serving the tennis ball, please identify how satisfied you are with your clothing.

(Circle)

	Too small/short	appropriate	Too large/long
18. Neck size	1	2	3
19. The amount fabric on your shoulder	1	2	3
20. Sleeve fullness	1	2	3
21. Crotch length	1	2	3
22. Pant Waist	1	2	3
23. Pants in the legs fullness	1	2	3



When you are in Stroke Position (Backswing), please identify how satisfied you are with your clothing. (Circle)

	Too small/short	appropriate	Too Large/long
24. Neck size	1	2	3
25. The amount fabric on your shoulder	1	2	3
26. Sleeve fullness	1	2	3
27. Crotch length	1	2	3
28. Pant Waist	1	2	3
29. Pants in the legs fullness	1	2	3



When you are in Smashing the ball, please identify how satisfied you are with your clothing.

(Circle)

	Too small/short	appropriate	Too Large/long
30. Neck size	1	2	3
31. The amount fabric on your shoulder	1	2	3
32. Sleeve fullness	1	2	3
33. Crotch length	1	2	3
34. Pant Waist	1	2	3
35. Pants in the legs fullness	1	2	3



In general, how satisfaction with your tennis clothing (Circle).

	Very dissatisfied			Very satisfied	
36.Style	1	2	3	4	5
37.Fashionable	1	2	3	4	5
38.Color	1	2	3	4	5
39.Fit	1	2	3	4	5
40.Attractiveness	1	2	3	4	5
41.Comfort	1	2	3	4	5
42.Size assortment	1	2	3	4	5
43.Brand name	1	2	3	4	5
44.Construction quality	1	2	3	4	5
45.Fabric quality	1	2	3	4	5
46.Fiber content	1	2	3	4	5
47.Pleasing to others	1	2	3	4	5

Please circle the garment part you most preference for each of the following sections.

48. What do you like?



T-shirt



Polo

Shirts

49. Neckline



V-neckline



Round

50. Armhole



Raglan



Set-in



Sleeveless

51.Length



High Hip



Hip length



Long

Short

52.Style



Dress short



Baggy short



Bike short

53. Waistband style



Elastic draw & string



Elastic only



Fly front

54. Waistband width 1 inch wide 2 inches wide 3 inches wide

55. Current Age:

56. Ethnicity : () Asian () Hispanic () Black () White () Other

57. Approximate Height :

58. Approximate Weight:

59. Do you have any other information or comment you would like to share?

Thank you!

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