

THE ROLE OF BODY MASS INDEX AND BODY SHAPE IN PERCEPTION
OF BODY ATTRACTIVNESS: CROSS-CULTURAL STUDY

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BODY ATTRACTIVNESS: CROSS-CULTURAL STUDY

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Marine Aghekyan, the younger daughter of Hovhannes Mkrtchyan and Nelzina Urumyan, was born February 1, 1972, in Yerevan, Armenia. She graduated from State Engineering University of Armenia with a Bachelor of Science degree in Department of Computer Systems and Informatics in May 1993. She worked as a Manager of Educational Exchange Programs for British Council Armenia - United Kingdom's international organization for educational opportunities and cultural relations – before she came to the United States. She entered Graduate School, Auburn University, in January, 2003. She married Rouben Simonian, son of Alexander Simonian and Galina Simonian, on July, 2003. They have one daughter, Elen Aghekyan.

THESIS ABSTRACT

THE ROLE OF BODY MASS INDEX AND BODY SHAPE IN PERCEPTION OF
BODY ATTRACTIVNESS: CROSS-CULTURAL STUDY

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The purpose of this study was to cross-culturally investigate the effect of BMI (Body Mass Index) and three body shapes (Rectangle, Pear, and Hourglass) on the perception of female body attractiveness and body size. A convenience sample of 107 American and 102 Russian female students between ages 18-over 25 participated in this study. A questionnaire coordinated with a stimulus presented in a Power Point format and composed of 27 images of body scans of women was used by respondents to rate body size and attractiveness. Body Mass Index (BMI) was used to categorize body sizes used in the stimulus as underweight, normal, and overweight. Three body shapes (hourglass, rectangle, and pear) were defined within the stimulus.

All research questions were analyzed and answered. Both, American and Russian students tended to see themselves as more overweight and less underweight than in reality. The scores of respondents' self-ratings and their perceptions of how others view their body image were generally similar for American and Russian students. Russian respondents reported lower scores on body attractiveness than American respondents for all 27 images. This research showed that overweight body scans were classified most correctly and were perceived as the most unattractive by both samples. Body scans with underweight BMIs were perceived as being the most attractive. There was a significant difference of perceptions of body sizes between Americans and Russians. There was no significant effect of body shapes on Americans' and Russians' perceptions of attractiveness. Perceptions of body sizes were significantly related to body shape categories for both American and Russian students. No relationship was found between the respondents' personal BMI category and their perception of body size. There was a significant relationship between American respondent's personal BMI categories and their perceptions of attractiveness. This relationship was not significant for Russian students.

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I. INTRODUCTION

There is increasing interest in understanding people's images of their body sizes and shapes and their perceptions of body attractiveness. This could be explained due to body image disturbances and eating disorders (Thomson, Penner & Altabe, 1990). Many socio-cultural factors of modern life, such as people's attitudes and associations towards obesity or extreme thinness, contribute to the problem of eating disorders (Davis & Yager, 1992). There are numerous studies investigating people's perceptions of body image and body attractiveness. Several studies focus on evolutionary psychology perspectives related to mate selection statements (Singh, 1993, 1994a, 1994b; Henss, 1995; Tovee, Reinhardt, Emery, & Cornelissen, 1998; Tovee, & Cornelissen, 2001; Tovee, Hancock, Mahmoodi, Singleton, & Cornelissen, 2002; Streeter & McBurney, 2003). Other studies were related to eating disorders (Gupta, Chaturvedi, Handarana & Johnson, 2001; Tovee, Mason, Cohen-Tovee, 2003; Forestell, Humphrey & Stewart, 2004). The desire to look attractive is the basis for both mate selection and eating disorder.

The evolutionary model hypothesizes that human beings prefer signals of health, youth, and fertility in potential mates (Buss, 1989). Singh (1993) predicted that fat distribution as measured by waist-to-hip ratio (WHR) was an indicator of health, youth, and fertility characteristics. WHR was measured as the ratio of the waist to hip

circumference. A low WHR was suggested to relate to the optimal fat distribution and accordingly high fertility, and was considered highly attractive. However, another group of researchers (Tovee et al., 1998; 2001; 2002; 2003) argued against this and suggested that Body Mass Index (BMI) is a better predictor of body attractiveness than WHR. BMI is an indicator of body build as it is the relationship between body weight and height. To support their hypothesis, these groups of researchers led by Tovee examined the fact that the figures of modern glamour and fashion models and found that they fall within a narrow BMI range. In addition, Tovee et al. (2002) stated:

“It is well established that changes in BMI also have a strong impact on health and reproductive potential. Therefore, a mate-choice strategy based on BMI also favors reproductive success” (p. 2206).

Tovee’s and Singh’s studies focused on WHR as a measure of shape for the human body. Low WHR was considered as more curvaceous body shape and accordingly high WHR was considered as more tubular body shape (Singh, 1994a; Tovee et al; 2002). WHR initially was defined by Singh (1993) as body fat distribution, and it is considered to be a description of body shape by clinical physiologists. In the fashion design industry, human body shapes are assessed by considering other body parts, as well.

There are many studies on classification of human body shape (Sheldon, 1940; Minott, 1972, 1978; August 1981; Armstrong 1987). All these classifications considered different parts and relied on indicators other than WHR. For example, Minnott (1972) portrayed thirteen body type categories, describing the body above or below the waist.

August (1981) and Armstrong (1987) set down body shapes describing different body parts considering front and profile views of a body.

A group of researchers (Connell, Ulrich, Brannon, & Presley, 2001) at Auburn University developed the Body Shape Assessment Scale (BSAS©) where body shape was assessed based on front and side views (see Appendix I). Nine scales, which can be used to assess whole and component body shapes, were developed by these researchers. Body shape assessment of rectangular, pear, inverted triangle and hourglass body shapes is one of the basic parameters assessed for a frontal view. A frontal view of body shape can be assessed the following characteristics:

1. Body Build: slender, average, full or heavy
2. Body Shape: rectangular, hourglass, pear or inverted triangle
3. Hip Shape: straight, high hip, mid hip or low hip
4. Shoulder Slope: square, average or sloped

The profile view of female body was used to assess

1. Torso: thin b/B/D, moderate b/B/D or heavy b/B/D
2. Bust Prominence: flat, average or prominent
3. Buttocks Prominence: flat, average or prominent
4. Back Curvature: flat, middle, high, and low
5. Posture: aligned, forward alignment, and compensating alignment

Three-dimensional body scans of 42 women aged 20-55 were used to develop the initial scales. Expert analyses of additional scans were used to confirm and clarify the final content of the BSAS©. The scale was transformed into a software program in order

to analyze female body scans. This research provided a new tool for understanding of body shape and its relations with body size.

There are a number of studies on the perception of body attractiveness from the perspective of eating disorders. Thinness is highly associated with positive features such as intelligence, self-discipline, education, social-class, personal and professional power and luck (Singh, 1994b). As a logical consequence of this perception, overweight and particularly obese people carry a negative message. Modern media and popular television programs strongly support this association often presenting larger people as unsuccessful, unattractive, and out of control. They are often subjects for jokes. Obese people are not shown as leaders or objects for romantic relationships (Greenberg, Eastin, Hofshire, Lachlan, & Brownell, 2003).

Women are seen as being more concerned with attractiveness than men. Barber (1995) explained the phenomenon related to men's selection of mates. According to Baenninger, Baenninger and Houle (1993), men select women with high fertility to perpetrate their race. Baenninger et al. (1993) suggest that age may be associated with fertility and rate females with obvious visual characteristics of youth and graciousness. To support this prediction Walsh (1993) stated:

“It has been reliably established in 37 different cultures that men want younger, attractive women – clues to reproductive health-... “(p.27).

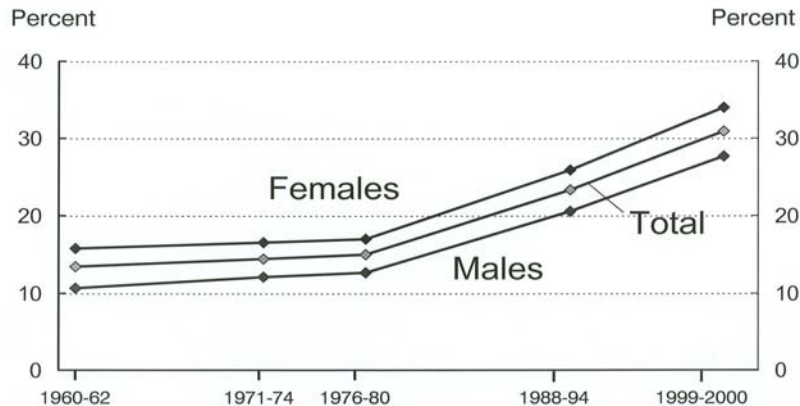
Baenninger et al. (1993) later expanded Walsh's statement in the following way:

“Enhancement of physical attractiveness via make up, jewelry, long shiny hair, and sexy clothing is one such set of characteristics that should influence selection choices by males” (p. 294).

As a logical addition to this set of characteristics, there are numerous studies that identify females’ body shape and size as a characteristic of attractiveness judged by others (Singh, 1993, 1994a, 1994b; Streeter et al., 2003; Henss, 1995; Tovee et al., 1998; 2001; 2002; 2003).

Thinness is highly emphasized in Western cultures. For instance, Playboy playmates and winners in the Miss America contest over the last three decades clearly demonstrated strong trends and preferences for thin bodies (Singh, 1994b). Thinness is a culturally desirable characteristic for U.S. women (Kaiser, 1990), but the rate of overweight and obesity in the U.S. has increased significantly in the last four decades (Schoenborn, Adams, & Barnes, 2002). Figure 1 demonstrates obesity trends of the U.S.A. population from 1960 to 2000, for ages 20 years and over.

Figure 1. Trends in adult obesity (Nutrition and Overweight Progress Review, 2004, obj. 19-2)



According to statistical data, around 54.7% of the U.S. population is overweight and 19.5% is obese (Schoenborn et al., 2002). These indicators conflict with the commonly valued preferences for attractiveness in today's society. The importance of thinness, attractiveness, and beauty for females explains the fact that most of the studies on obesity and attractiveness have been conducted with females (Franzoi & Shields, 1984; Jackson, Sullivan & Rostker, 1988). Negative association with obesity creates psychological problems such as bulimia and/or anorexia nervosa as many women try to obtain the ideal body shape and often fail in doing this (Cash, Winstead, & Janda, 1986).

A Cross-cultural Review of Female Body Ideals

In contrast to the U.S. and other Western countries, the perception of body attractiveness in developing societies is different. In these countries a high level of body

fat is generally associated with high social status, health and wealth (Sobal & Stunkard, 1989; Bush, Williams, Lean, & Anderson, 2001). People's attitudes toward fatness in women differ in cultures (Furnham & Alibhai 1983; Ford & Beach, 1952; Sobal & Stunkard, 1989; Brown & Konner, 1987). Bush et al. (2001) explained this phenomenon, stating:

There is a complex relationship between body fat and economic security, which ties up with the body shapes, which are prestigious and preferred in different types of culture or economy. (p. 208).

Sobal et al. (1989) reviewed around 144 published articles on the relationship between obesity and socioeconomic status and derived the number of variables that may influence females' attitudes toward obesity and thinness in developed societies. Sobal et al. found that in industrialized countries, thinness is associated with high status, whereas in developing countries it is replaced with obesity. In order to explain this phenomenon, it was suggested that dietary restraint, physical activity, social mobility, and inheritance might be major variables that influence such perception.

Later, Anderson, Crawford, Nadeau, and Lindberg (1992) tried to explain the phenomenon, suggesting placing beauty standards in an "evolutionary context". These researchers suggested that beauty standards should be correlated with food supply reliability, food storage mechanism, male preferences, social stressfulness of adolescent sexuality and dominance of women and men, as well as economic importance, capability of childcare, socioecological variables, and climate. It is interesting to mention that Anderson et al. predicted that

Standards of beauty should be correlated with indicators of average temperature, e. g. latitude, such that cold climates (high latitude) tend to be associated with relatively fat standards of beauty and warm climates (low latitude) tend to be associated with relatively thin standards of beauty (p. 202).

Russia in the Framework of the Current Study

Russia's population (over 145.2 million) (Russian Census Results for 2002) and its recent economical and political changes make Russia one of the largest emerging markets. Being geographically located between Europe and East Asia, Russia cannot be considered a typically European or Asian country. Despite the geographical location, Russia is still facing numerous transitions since the collapse of the Communist regime, which was dissolved in 1991. A period of reforms started, requiring an immense effort to create a democratic Russian society with a stable economy (Satter, 2003). After more than seven decades of restrictions on freedom and democracy under the Regime, Russia needed new moral values and all attention was shifted to capitalism. However, it is well known that the transition toward a free market economy in Russia was not smooth and resulted in a decline of the economy and living standards of Russians. Arbatov (2001) stated:

“The sharp decline in the standard of living of the overwhelming majority is not only expressed in the obvious fact that diet, health, and elementary conditions of life have become worse for millions of people, but also in the loss of social benefits” (p. 173).

In addition, it is very difficult for a non-specialist to analyze the impact of all transitional stress on the people's psyche and emotions. Siegrist (2000) suggested that the

stressful economical transition could be linked to physical and psychological health. To support Siegrist's prediction Shteyn, Schumm, Vodipianova, Hobfoll, and Lilly (2003) concluded that Russian women's psychological distress is highly correlated with the economic losses that the country passed through.

As a result of all the reforms and changes that the country passed through, unbalanced social classes were formed in Russian society. There is no solid group of people that falls into the middle class category (Maleva, 2004). Some people came into their fortune during the very first years of 1990's and created the so-called "noviye Russkiye" (new Russians, new rich) group. Children of so-called "new Russians" get their education in Swiss and British boarding schools; have police guards, and drive Mercedes, Ferraris and Bentleys (Tavernise, 2003). However, the majority of people still fall into the lower middle and lower classes and cannot afford all the luxury that "new Russians" can afford (Maleva, 2004).

Living under Soviet deprivation for many years made people hungry for luxury and Western culture. Russian people started absorbing everything that was "foreign" and western. "We were like kids in a candy store", said Olga Sloutsker, founder of an elite chain of fitness centers in Moscow, referring to the time when the Soviet Union began to open up to the outside world. "We wanted to use and consume everything that was there" (Tavernise, 2003).

However, the young generation, e.g. current students that can be considered as the first generation that came of age after communism, remember little of Soviet misery (Tavernise, 2003). They live in a society where new ideals exist alongside old ones, where old and new values are still struggling, and where generations with different

historical and ideological heritages co-exist. Nevertheless, it can be expected that all the economical and political changes that Russia passed through impacted not only on various economical indicators such as household income, unemployment rate, Gross Domestic Product and Gross National Product percentage, but also a number of social characteristics that are closely interconnected with the health of the Russian people. Recent economic changes together with the popularity of “new” (Western) values influence people’s perceptions and attitudes on a healthy lifestyle. This is strongly emphasized in the younger generation since they do not carry the old system’s heritage and are more Westernized due to the great amount of exposure to modern media, TV, and pop art.

During the last decade there were shifts in the nutritional patterns of Russians (Zohoori, Mroz, Popkin, Glinskaya, Lokshin, Mancini, Kozyreva, Kosolapov, & Swafford, 1998). Zohoori et al. (1998) noticed an increase of obesity in Russia from 1992 to 1996, which can be correlated with the increase of alcohol consumption during this period. With the recovering economy in the last few years, current indicators demonstrate that Russian adults’ main nutritional problems are related to weight with more overweight and obese individuals in the population (Sedik & Wiesmann, 2003). Over 50% of Russian people are overweight (Lester, 2000). Sedik and Wiesmann (2003) explained this trend as a Soviet heritage, where a high meat, high calorie, high protein diet was emphasized. Table 1 shows the overweight rate by age and sex.

Table 1

Russian Nutritional State in 1996. Baturin (2001)

Age	Sex	Underweight (BMI<18.5)	Normal weight BMI 18.5-25.0	Overweight BMI 25.1-30.0	Obese BMI>30.0
18-29	F	8.1%	66.2%	17.0%	8.7%
	M	1.8%	76.9%	17.8%	3.5%
30-59	F	1.6%	33.9%	34.0%	30.5%
	M	1.0%	51.5%	36.3%	11.2%
60+	F	1.9%	24.6%	37.9%	35.9%
	M	2.5%	43.6%	39.3%	14.5%

What impact might these indicators have on commonly valued standards of attractiveness in the country? Considering that the rate of overweight and obese individuals is very high in Russia and the society passed through and is still experiencing many unique economical and physiological changes, one may ask, “what is the perception of beauty in this country”? How do people perceive women’s attractiveness? With little research examining the psychological impact of recent changes on Russian people, society and perceptual aspects of attractiveness Russia is interesting country to study (Shteyn et al., 2003).

Importance of This Study

Testing people's perceptions of body attractiveness cross-culturally is important to better understand the role of cultural preferences for size and body shape. For this research U.S. and Russian perceptions were studied. A cross-cultural study of American and Russian students will provide an understanding of how much the younger generations of both countries share the same ideals and perceptions for physical attractiveness of females. Understanding differences and similarities for both cultures will provide global insights into the perceptions of beauty within different sociocultural environments that broadcast norms of extreme thinness through fashion, beauty ads and mass media. As scientists and experts in the areas of physiology, sociology, and medicine think about new strategies to help women with their physical and emotional health, understanding the perception of attractiveness is important from a global spectrum.

Statement of the Problem

There are a number of studies on the relationship between body mass index (BMI) and body shape (considered as waist-to-hip ratio WHR) developed by physiologists that report the importance of these two factors as the main cues to female body attractiveness. However, not much research has been conducted in this field cross-culturally and even fewer studies have considered body shapes as defined by experts in the apparel field. With global trends indicating a larger percentage of overweight and obese individuals, it was important to understand how different cultures view body size, shape and attractiveness.

Purpose and Research Questions

The purpose of this study is to cross-culturally investigate the effect of body size as characterized by BMI and three body shapes (*Rectangle*, *Pear*, and *Hourglass*) on the perception of attractiveness and body size for the female body.

The specific research questions are as follows:

1. Are there differences between American and Russian female students' perceptions of the attractiveness of women's bodies?
2. Is there a difference between perceptions of attractiveness among body shapes (hourglass, rectangle, and pear) for American and Russian female students?
3. Is there a relationship between perceptions of attractiveness and body size for American and Russian female students?
4. Are there any differences between American and Russian female students' perceptions of women's body sizes?
5. Does body shape (hourglass, rectangle, and pear) influence American and Russian students' perceptions of three body sizes (underweight, normal, overweight) in both samples?
6. Is there a relationship between American and Russian students' personal BMI scores and their perceptions of body size in both samples?
7. Is there a relationship between American and Russian student's personal BMI scores and their perceptions of body attractiveness?

Definition of Terms

For the purpose of this study the following terms are defined for clarification.

1. Body shape – Relationship of body width among the shoulders, waist and fullest part of the hip region viewing the body from the front (Connel et al., 2002)

1a. Rectangular – Shoulders and hip width are visually balanced with little to no waist definition

1b. Hourglass – Shoulders and hip are visually balanced with clearly defined to very small waist in relation to shoulder and hip width

1c. Pear – Hip and/or thigh width visually greater than shoulder width.

1d. Inverted triangle – Shoulder width is visually greater than fullest width at hips or thighs.

2. Body Mass Index (BMI) – Relationship between body weight and height that is clarified with a comparative number. The formula that is used in order to calculate BMI is weight to height ratio in the metric system (kg/m^2); and ($\text{pounds}/\text{inches}^2 \times 703$) in English system.

3. Body build – Indicator of BMI that is categorized as *underweight*, *normal*, and *overweight*.

3a. Underweight – The BMI number that is smaller than 19.0.

3b. Normal – The BMI number that lies between 19.1 and 25.0.

3c. Overweight – The BMI number that lies between 25.1 and 30.0.

4. Waist-to-hip ratio (WHR) – The ratio of waist and hips circumferences (Singh, 1993).

II. LITERATURE REVIEW

The review of literature includes previously conducted studies in areas of: Body image, sociocultural ideals of body and recent trends, body shape, Body Mass Index, waist-to-hip ratio versus body mass index and methodology, body scanning in the framework of body shape analysis, and cross-cultural research of body attractiveness.

Body Image

The subject of body image is very broad in scope and its use as an “umbrella” depends on each researcher’s own definition (Thompson et al., 1990). Schilder (1935) formulated the concept of “body image” as an integral physiological phenomenon. In his work Schilder explained body image in the following way:

The image of the human body means the picture of our own body, which we form in our mind, that is to say the way in which the body appears to ourselves...The body schema is the tri-dimensional image everybody has about himself. We may call it “body image.” (p.11)

Schilder was interested in practical aspects of the body experience, such as fluctuations in body size perception, feelings about body size, and awareness of outer and

inner regions of the body. Following Schilder, many other scientists devoted a number of studies to body image (Fisher, 1986, 1989, 1990; Shontz, 1969, 1990; Thomson, 1990, 1996; Cash & Pruzinsky, 1990). Research dealing with this topic increased by 1990 and developed in various directions in the social sciences (Fisher, 1990). Body image scholars agree that the subject of body image is a multidimensional phenomenon. Dominant disciplines involved in this research were mainly clinical psychology and psychiatry, with applications pertaining to eating disorders among young women. However, studies have been done in other social and behavioral sciences as well (Cash, 2004). Fisher (1990) mentioned nine main areas of body image:

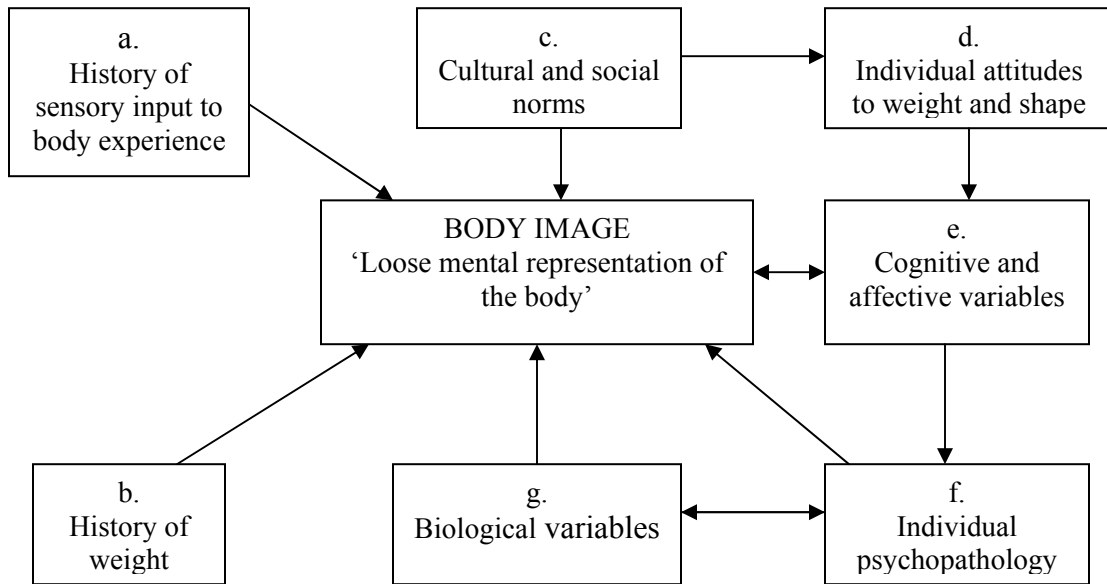
- (1) Perception and evaluation of one's own body.
- (2) Accuracy of perception of one's body size.
- (3) Accuracy of perception of one's body sensations.
- (4) Ability to judge the spatial position of one's body.
- (5) Feelings about the definiteness and protective value of the body boundaries.
- (6) Distortions in body sensations and experiences associated with psychopathology and brain damage.
- (7) Responses to body damage, loss of parts, and surgery.
- (8) Responses to various procedures designed to camouflage the body cosmetically or somehow to "improve" it.
- (9) Attitudes and feelings pertinent to the sexual identity of one's body. (p. 17)

Cash (2004) defined body image as an “inside view”. He also mentioned that body image refers to “especially, but not exclusively, one’s physical attractiveness”. According to these definitions, it becomes clear that body image consists of many components. Slade (1994) explained two main components of body image in the following manner:

That is, body image is viewed as having two main components, a ‘perceptual component’ and an ‘attitudinal component’. These correspond to the distinction that is often drawn between ‘body percept’ and ‘body concept’. Paralleling this conceptual distinction, a similar one is made practical in the experimental literature on eating and weight disorders, between techniques which are focused on the assessment of: (1) the accuracy of an individual’s body size estimation; and (2) the attitudes/feelings an individual has towards their own body. The former is viewed as a ‘perceptual’ judgment, while the latter is generally considered to reflect ‘attitudinal, affective and cognitive’ variables. (p. 497)

In addition, Slade (1994) presented body image in a general schematic model (see Figure 2), demonstrating all the factors that influence the development of body image.

Figure 2. Schematic model of body image. (Slade, 1994, p. 501)



Taking into account the factors presented by Slade in this model, it can be summarized that body image can be perfectly explained as a "loose mental representation of the body's shape, form and size" (Slade, 1994, p.502) that is interconnected by a number of variables such as culture, biology, history and others. This idea was later supported by Cash and Pruzinsky (2002). The authors mentioned that a complete understanding of the topic of body image involves in-depth endorsement of culture and personal context of representation.

Sociocultural Ideals of Body and Recent Trends

The subject of physical beauty has been an important idea for artists, writers, and philosophers throughout the ages. Many individuals have tried to follow an ideal body shape that has changed over the years. In fact, the publicly desirable body shape of the “ideal” woman has been changing for centuries. A number of studies have documented the evolution of ideal body shapes (Garner, Garnfinkel, Schwarz, & Thompson, 1980; Berg, 2000). In the 18th century, women were predominately pear-shaped; in the late 19th century the Gibson Girl look was popular: it was an hourglass shape with feminine curves (Berg, 2000). In the beginning of the 20th century, women gained more freedom and put aside their corsets. As a result, rectangular and slim body shapes became acceptable and fashionable. During World War II, and the next decade the standard was the hourglass figure. In 1960s, the phenomenon of the model Twiggy introduced a thinner body style. In the 1980s, strong preference was given to the thin but muscle-toned look.

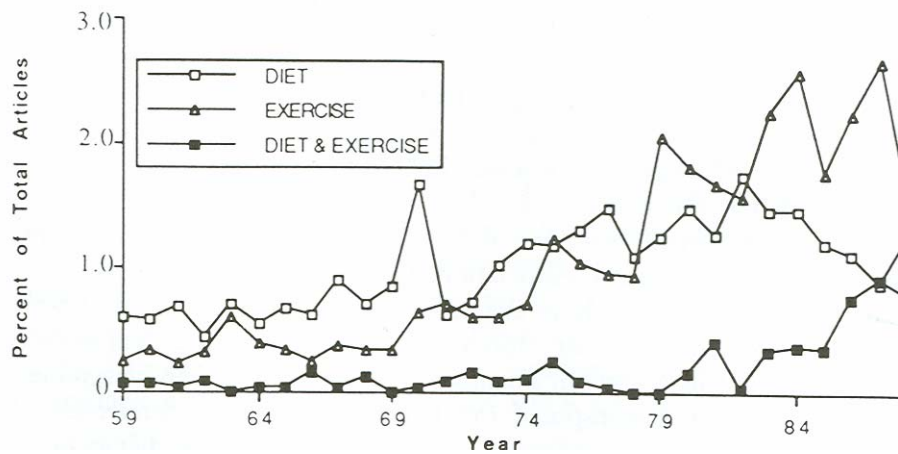
Research by Douty and Brannon (1984) showed that both male and female respondents rated thin bodies with a small waist and hips as the most attractive figure. However, among the many body characteristics that influenced the ratings, body weight was the most important. For the present time a thin but toned body shape is dominant for the ideal body type (DeVita, 1998). Some researchers suggested that ideal body shapes change across cultures (Furnham et al., 1983; Furnham & Baguma, 1994; Altabe, 1996).

Both body shape and body size appear to have passed through stages of evolution. Zerbe (1993) noticed:

In 1968, the average fashion model was 8% thinner than the average women. Today, models are 23% thinner, perpetrating unrealistic ideals of beauty and attractiveness” (p.102).

More recent studies’ suggest that Playboy icons and Miss America participants have become slimmer over the past 40 years (Singh, 1995). Groups of researchers led by Silverstein (Silverstein, Perdue, Peterson, & Kelly, 1986; Silverstein, Peterson, & Perdue, 1986) examined popular magazines and noted an increasing trend toward slenderness and thinness of models. Later, Wiseman, Gray, Mosimann, & Ahren (1992) updated these studies by recording the number of diet, weight loss exercise, and diet and exercise articles in major women’s magazines for a 1959 to 1989 time interval. They found that there was an overall increase in weight loss promotion. Figure 3 graphically demonstrates the proportion of diet, exercise and diet and exercise in the major women’s magazines from 1959 to 1989.

Figure 3: Number of articles as a percent of total articles in six women's magazines. (Wiseman et al., 1992, p.88)



Berg (2000) suggested that the main messengers and pressers of the contemporary ideal look are not only women's magazines, but modern media with all its forms: magazines, television, and popular art. He noted that in 1973 there were no television diet promotion programs and advertisements, whereas nowadays they cover about 5% of overall TV advertisements. Berg also mentioned that all the models in magazines and TV shows could be summarized as one model, "one who is thin, youthful, beautiful, and who, in reality, represents perhaps five percent of women in America" (2000, p. 31). Wiseman et al. (1992) and Berg (2000) suggested that typical modern models have more tubular and angular body types, with almost no curves at the hip area and weigh in at 13% to 19% below normal weight. According to the National Center for Health Statistics, the clinical criteria for anorexia nervosa is 15% below expected weight (American

Psychiatric Association, 1994). All the active propaganda and messages on modern glamorous bodies contributed to the thinness obsession in U.S. society that eventually increased the frequency of such clinical problems as eating disorders (Berg, 2000).

Dally and Gomez (1980) explained the obsession with slimness with its association with social attractiveness, youth and elegance, whereas obesity is associated with unattractiveness, failure, and depression. Researchers found that thinness and beauty become almost synonyms in Western societies (Striegel-Moore, McAvay, & Rodin, 1986, Thomson, 1990). In a society where “what is beautiful is good” (Franzoni & Herzog, 1987, p. 19), thinness is valued as a yardstick by which a woman’s chance for romance and/or happy marriage, ability on the job and popularity is measured (Berg, 2000).

Body Shape

Body shape was first introduced in the field of psychology in 1940 by Sheldon (Sheldon, 1940). His theory of *Somotypes* was described in the book of *The Varieties of Human Physique*. He defined three diverse categories of human body shapes:

- (1) endomorph;
- (2) mesomorph;
- (3) ectomorph.

An endomorph was classified by a predominance of body fat and refers to soft roundness throughout the body. It was categorized mainly as a pear shape body, with full abdomen and little muscle. In contrast to endomorph, a mesomorph was described as having well developed muscles, and mostly refers to a square, bony-looking body, with

wide shoulders and small abdomen. The last one, ectomorph, mostly refers to slender bodies, with minimum proportion of muscle and fat. Sheldon's (1940) study was conducted on a sample of 4000 students at Harvard University using a photographic method.

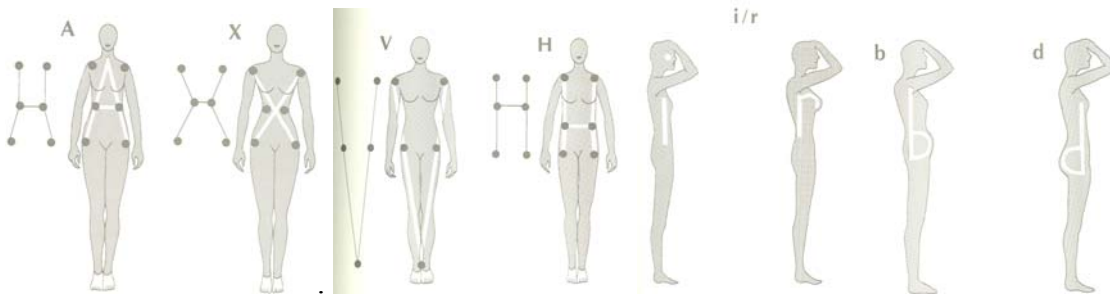
Later, body shape was studied as well as by experts in the apparel field. Minott (1972, 1978) observed different parts of the human body. It was found that the shape of shoulders and hips could be different. For instance, shoulders were classified as wide, narrow or average and correspondingly hips could be heart shaped, diamond shaped or standard shaped. A heart shaped hip categorized a person whose high hip circumference was greater than the lower hip. Similarly, a person who had 11 ½ inches more in the lower hip than in the waist and smaller thighs was classified as a diamond shape. There were also some classifications for body posture were also included.

Another group of researchers in the apparel field, Douty, Moore and Hartford (1974), analyzed eleven body characteristics of college women and their relationship with personality. These characteristics were examined based on body type and posture. They were: body build, bust size, body tension, lower back curve, pelvic tilt, knee tension, upper back curve, head position, shoulder slope, global posture quality and figure impression. A midpoint of 3 was used in rating these characteristics as it was the hypothesized location of the mean population. In order to observe a height-weight relationship, a body-build scale was used. Posture and body-build scales served to obtain continuous variable measurement of body characteristics. The results showed that individuals with normal body build might not have tendencies that affect their

personality. It was concluded that variables of body image and self-perception needed further investigation.

Bonnie August (1981) presented seven body shapes in her *Complete Bonnie August Dress Thin System* book. She devised a Body Type alphabet as a way to recognize the various proportional imbalances of a human body. August identified four main categories of body type and classified them as *A*, *X*, *V* and *H* types (see Figure 4). An *A* type person was recognized by narrow shoulders and wider hips; an *X* type by proportional shoulders and hips; a *V* type by broader shoulders and narrow hips; and an *H* type by almost the same width of shoulders, hip and waist line. August also evaluated side views of individuals and classified them based on the lower case alphabet as ‘b’, ‘d’, ‘i’, and ‘r’ types (see Figure 4). The ‘b’ and ‘d’ types were recognized as prominent abdomens and derrières. An ‘i’ type was a person with minimal bust line, and ‘r’ had an emphasized bust. August mentioned that many women have a combination of more than two body types.

Figure 4. August's body shapes



Armstrong (1987) defined four body shapes as follows:

- (1) Hourglass;
- (2) Rectangular;
- (3) Inverted Triangle;
- (4) Pear shape.

These body types were analyzed based on shoulder/hip relationships. Hourglass shape was described as having aligned shoulders and hips with waist/hip circumference difference of 13 or more inches. Rectangular shape was identified also with aligned shoulders and hips but waist/hip circumference difference of 8 or less inches. Inverted Triangle shape was described as a body where shoulder width exceeded hip width, and Pear shape was categorized by a body with broader hip width and narrower shoulder width.

Alexander (2003) conducted a study that investigated relationships among body shape characteristics. In this study, 529 body scans were utilized to assess female body shapes. It was reported that only three (0.6%) Inverted Triangle shapes were identified among respondents and nearly half of sample was identified as *Pear* shape. These findings suggested that in reality women were becoming more pear shaped.

Connell et al. (2001) presented a new tool for understanding and assessing of body shape as well as its relationship to body size. The Body Shape Assessment Scale (BSAS©) developed by the researchers was used to assess body shape based on front and side views (See Appendix A). For development 42 body scans were used to define the range of body shapes in the female population. Body shape assessment models literature were used to develop nine scales reflecting whole and component parts of female figures. Experts were used to assess the validity of the BSAS©.

Body Mass Index

Body Mass Index (BMI) is a number that expresses the body build of a person, which is related to several disease risks. BMI is calculated by weight (in kilograms) and height² (in meters) ratio (kg/m²). The World Health Organization (WHO), the Center for Disease Control (CDC) and the National Heart, Lung and Blood Institute (NHLBI) categorized peoples' body build by BMI range. According to that categorization, there are underweight, normal, overweight, and obese groups. WHO and NHLBI suggested that overweight and obesity is associated with health risks. Table 2 demonstrates BMI ranges according to the National Health and Nutrition Examination Survey (NHANES II, 1946-1986).

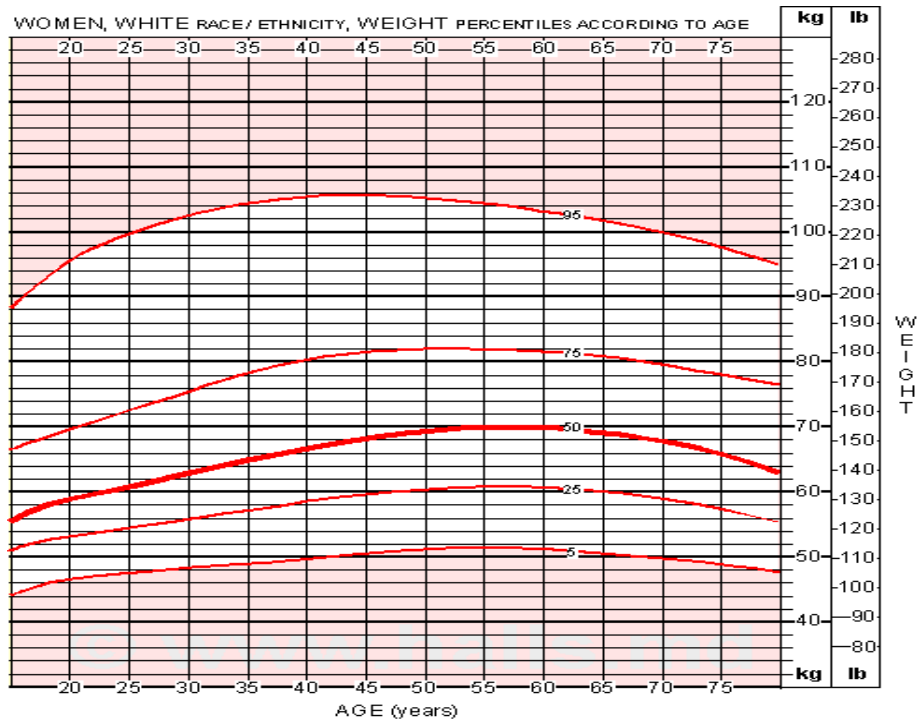
Table 2

BMI values for NHANES II

Underweight	Normal	Overweight	Obese
BMI<19.0	BMI 19.1-25.0	BMI 25.1-30	BMI>30.1

Stevens, Cai, Juhaeri, Thun, & Wood (2000) noted that the BMI categorization system has been controversial. Some researchers' expressed concerns about defining overweight and obesity. Stevens et al. (2000) noted that the cutoff point of 25 is too low to be considered for overweight. However, Halls (2002) found that women believe that a BMI of 20 to 22 is the best range to look attractive. The BMI range changes over the lifespan (Halls, 2002). Figure 5 demonstrates that women's BMI tends to increase up to 50-60 years and then gradually decrease.

Figure 5. Women's average weight chart and percentile distribution. Halls (2002)



It is noted that not only overweight but underweight people are also under significant health risk. This is very important point since beauty preferences of modern society very often portray an unrealistic narrow range for female bodies.

Waist-to-hip Ratio versus Body Mass Index and Methodology

Singh (1993) suggested that the amount of fat, and most importantly its distribution, determines female body attractiveness. Fat distribution was measured by the WHR. It represents gynoid fat distribution that is produced after puberty in females. A slight increase in obesity and/or dieting does not significantly amend body fat distribution (Singh, 1994a), explained body fat distribution in the following manner:

Gynoid and android fat distributions can be ascertained by measuring waist (narrowest portion between ribs and the iliac crest) and hip (at the level of the greatest protrusion of the buttocks) circumferences and computing a waist-to-hip ratio (WHR). The WHR indexes both the distribution of fat between upper and lower body and the relative amount of intra- vs. extra-abdominal fat. WHR correlates significantly ($r=0.60$) with direct measures of the intra-abdominal/subcutaneous fat ratio, as well as with deep abdominal fat ($r=0.76$) measured with computed tomography scanning. (Singh, 1994b, p. 124).

WHR is measured by the ratio of waist circumference and hip circumference. Tovee et al. (2002) noted that there are two types of WHR – actual and front. Front WHR can be calculated by dividing the distance across the waist by the distance across the hips (Tovee et al., 2002). Front WHR is considered a visual cue, yet the actual WHR is a physical element that is connected to fertility and healthiness.

Singh (1993) also investigated the relationship of WHR to women's healthiness, youthfulness, reproductive capability and desirability in mating. He found a close correlation between all these variables except youthfulness. Health concerns showed that fat distribution was related to risks of having diabetes, stroke, heart attack, hypertension and cancer. High WHR was connected with difficulties in becoming pregnant. The relationship between WHR and reproductive capability was also reported by a group of researchers led by Zaastra (Zaastra, Seidell, Van Noord, Te Velde, Habbema, Vrieswijk, & Karbaat, 1993). The most attractive, hence, more healthy and fertile women, were rated as those with 0.7 WHR (Singh, 1993, 1994a, 1994b; Henss, 1995). Singh's results

suggested that WHR played the most important role in the evaluation of women's body attractiveness.

Besides WHR, there is another physical characteristic that controls women's body attractiveness, and that is BMI (weight and height ratio(kg/m^2)). Crandall and Bierat (1990), Fallon and Rozin (1985), and Garner et al. (1980) reported that thin women were perceived as more attractive than overweight and/or obese. In contrast to Singh (1993) and other groups of researchers (Tassinary & Hansen, 1998; Henss 1995, 2000) who suggested WHR as an indicator for women's body attractiveness, there was another group of researchers (Tovee et al., 1998; 2001; 2002; 2003; Tovee et al., 1999) who reported BMI as a more important characteristic in rating women's body attractiveness than WHR. In their study, Tovee et al (2003) found no significance of a 0.7 WHR in rating an ideal body. Their research found that BMI was a much stronger factor for defining attractiveness than body shape.

Singh (1993) used 12 line drawings with WHR ranging from 0.1 to 0.7. However, other researchers noted that Singh's findings could be affected by the small variability within WHR ratio (Tassinary et al., 1998). Tassinary and Hansen criticized the fact that the majority of studies in this area were restricted by using the set of line drawings developed by Singh as a stimulus material. These researchers developed 27 images that consisted of three hip, waist and weight sizes. However, these images were again developed as line drawings. Forestell et al. (2004) discussed the involvement of body weight and shape factors in ratings of female attractiveness and replicated previous findings (Singh, 1993, 1994a, 1994b; Henss, 1995) that WHR 0.7 was rated as the most attractive and that hip size was considered as the criteria of attractiveness perception

rather than body weight. For this study the authors (Forestell et al.) developed twenty-seven black line drawings of female silhouettes ranging from 0.5 to 0.9 in WHR. This group of researchers noted that body weight, size, and WHR interacted to affect the rating of body attractiveness. It was noted that the use of silhouettes could compromise “the validity of the results in the present study” and the authors suggested using more realistic stimuli (for example, photographic images, 3-D images) for future studies.

Henss (2000) used color photographic images as stimuli in his research to estimate female attractiveness. He noted that line drawings used by Tassinari et al. (1998) were less realistic and less appealing than Singh’s (1993) and added that due to the quality of Tassinari and Hansen’s stimuli, their research “deserves little credit”. Henss’s (2000) photographic images study were taken from fashion catalogues and the Internet. Henss replicated the previous findings (Singh 1993; Henss, 1995) that WHR is an important determinant of female attractiveness. Henss digitally manipulated pictures changing WHR of figures. In this study, Henss asked each participant to judge only one stimulus. In this case, he thought that manipulation of WHR, the central variable, would not be obvious to the subjects. Hence, this would create a more naive environment in which to obtain valid data (Henss, 1995).

The method used in Tovee’s studies (Tovee et al., 1998, 2001, 2002, 2003) was relatively more advanced and totally different than that used in previous research. These researchers did not use line drawings in their studies. Photo images (Tovee et al., 2001; 1999; Tovee, Tasker & Benson, 2000) and real body images (Tovee et al. 2003) were utilized instead. In the most recent study (Tovee et al., 2003), a special body-shape software package was developed in order to allow all participants to manipulate body

shape and size of real body scans. A total of 197 participants were videoed in a certain pose. These images were later input into software. The same individuals participated for rating body size and shape. The software allowed participants to see a high-resolution image on the computer screen as well as provided a set of graphic slides that supplied an additional opportunity to alter the shape of body parts (e.g. arm, leg, chest, hips, etc.). The results of this study showed that the most attractive bodies had an average BMI of 20 and their WHR did not approach 0.7 as was suggested by Henss (1995) and Singh (1993). It was concluded that participants in the study were more concentrated on body size than body shape while setting their ideal body.

To confirm their hypothesis that BMI is a more important predictor of women's body attractiveness than WHR, Tovee et al. (2001) conducted another study to investigate the perception of attractiveness in both front and profile views of figures, where body shape might play a significant role. To rate attractiveness, color images of 50 women in front and profile views were used. Ten images were presented in five BMI levels: below 15; 15-19; 20-24; 25 -30, and over 30. Participants rated front and profile view images separately. The results supported the idea that BMI was a more accurate visual cue for attractiveness than WHR.

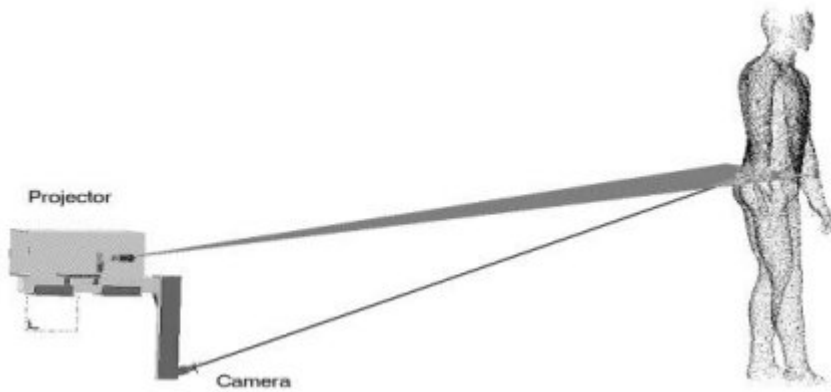
Body Scanning in the Framework of Body Shape Analysis

Researchers in various disciplines have studied human body shape. Douty (1968) developed a graphic somatography technique. Earlier studies used photographs (Sheldon, 1940); others developed and used silhouette figure drawings (Singh, 1993; Stunkard, Sorenson, & Schulinsinger, 1983). The methodology of using silhouettes for body image

scales was criticized by Gardner, Friedman, and Jackson (1998). The lack of a large number of varieties of figures, the ordinal nature of scales and possible problems with size differences between adjacent figures could affect the validity of the instrument. In a more recent study, Forestell et al. (2004) also noted that use of silhouettes might compromise the validity of the results in their study. To avoid it, researchers suggested using more realistic stimuli such as photographic images or 3-D images for future studies.

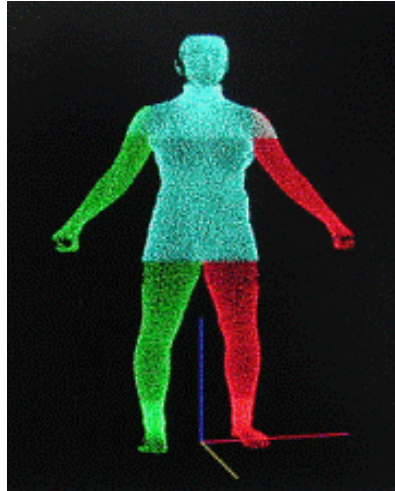
Today's technologies offer an opportunity to get a full three-dimensional view of the human body. Body scanning is innovative and can be successfully used in different areas such as medicine, the film industry, gyms, museums, and the apparel industry (Alexander, 2003). The earliest method of shadow body scanning was developed in Loughborough University in the U.K. This method required only a desk-lamp, camera, pencil, and a checker board. Laser based and moiré-based scanning systems allowed digitizing the human body (Alexander, 2003). Both systems are optically based and consist of light sources, cameras, software, and a computer (Daanen, & Van de Waters, 1998). The subject usually wears closely-fitted clothes and stands in a pose and location as directed. Using laser, light and cameras, the measurements of subjects are captured (see Figure 6).

Figure 6. Triangulation between projector camera and target subject. Textile Clothing Technology Corporation ([TC²] Web site



As it is illustrated in Figure 6, the vertical line projected by the laser to the object is triangulated to the camera that captures an image. The software program provides an opportunity to translate 3D images from cameras into computer. Figure 7 shows the final result of the scanning procedure.

Figure 7. Real body scan ([TC2] Web site



3D body scans are already used in the apparel industry for virtual shopping, apparel sizing and custom clothing (Alexander, 2003). Hutton, Bayley, Broadhead and Knox (2002) noted that body scans provide a remarkable capability for human body shape analysis. Due to the novelty characteristic, body scans have not been widely used for this purpose. In 2002, Istook, Simmons, and Devarajan (2002) used 222 body scans to analyze whole body shape. Each shape was described using circumference of bust, waist, hip, stomach, and abdomen. Istook et al. (2002) categorized nine body shapes: bottom hourglass, hourglass, spoon, rectangle, oval, triangle, diamond, inverted triangle, and top hourglass. Though it was assumed that most of the young female subjects would have an hourglass shape, the results showed that the majority of the sample had a spoon shape. Spoon shape was described as having lower bust-to-hip ratio than is formed in the

hourglass shape. A more recent study conducted by Alexander (2003) showed that a majority of her sample (45.4%) fell into the *Pear* shape class. In this study body scans were assessed for whole body and body part components based on nine categories. These nine categories: Body Build, Body Shape, Posture, Hip Shape, Shoulder Slope, Front Torso Shape, Bust Prominence, Buttocks Prominence, and Back Curvature. Her findings showed that BMI categories (underweight, normal, overweight and obese) were significantly related to Body Build categories as defined by the BSAS© (Slender, Average, Full and Heavy). In addition, significant relationships were found between Body Build, Body Shape and Age values for rectangular and pear shapes.

Cross Cultural Research on Body Attractiveness

According to Mazur (1986) the geographic variability in the perception of beauty, which existed in earlier periods, is altered nowadays due to the rise of mass media. To support this statement Hogg and Graham (1995) investigated the determinants of human beauty and suggested that the perception of beauty was not based on cultural influences. However, Fallon (1990) mentioned two disparate beliefs about the determinants of body attractiveness in each culture: “biological determinism and culture”. According to his theory, each cultural group has different beauty standards and, naturally, the perception of attractiveness varies from culture to culture.

The question about factors that constitute a universal criterion of attractiveness has many assumptions. Social biologists think that it is culturally invariant; however cross-cultural physiologists assume cultural-specific factors. There are a number of cross-cultural studies that report differences and similarities in perceptions of physical beauty

and attractiveness. For some cultures there are standards of body attractiveness that are predictable (Furnham et al., 1983, 1994), whereas for other cultures these standards are very different (Furnham, Tan & McManus, 1997; Furnham & Nordling, 1998; Bush et al. 2001; Gupta et al. 2001).

Furnham et al. (1997) cross-culturally investigated preferences of both female and male body shapes. For this study samples from Denmark and Portugal were observed. Choosing these countries was justified by the fact that Denmark was known as a rich and less sex-stereotyped European country, whereas Portugal was a relatively poor and more sex-stereotyped European country. Results of this research showed that females and males of both samples had different preferences for body shapes. For instance, Portuguese females demonstrated higher preference for the female figure that resembles pregnant women. In contrast, Danish female and male samples had more preference for angular female figures.

Wilson, Sargent, and Dias (1993) studied selection of ideal body size for 93 black and 80 white females in a U.S. high school. Findings of this research reported that black adolescents have higher preferences for a larger body size than their white peers. Another study conducted by Westman and Marlowe (1999) compared the Hadza of Tanzania with the U.S. subjects. Seventy-three Hadza and 24 U.S. subjects were tested for preferences for female WHR. The Hadza sample appeared to use body weight instead of WHR in judging the female body. Body weight in this study was presented in three levels: high, medium, and low with two levels of WHR: 0.7 and 0.9. Results indicated that the Hadza sample could be affected by the small variation of WHR and by using line drawings as a stimuli. These stimuli were the same as those used by Singh (1993) where women

appeared with long hair. Long hair women are not typical in the Hadza culture. That could have added a confounding point regarding in the methodology used in this study. However, a preference for a small WHR was found also by Yu and Shepard (1998) in studying Matsigenka culture. They initially assumed that standards of beauty would vary across cultures and that WHR is not a universal characteristic for females' body attractiveness. They found that low WHR was less preferred in groups who experienced little influenced from the Western culture. In addition, Yu et al. also found that heavier females were more preferred than thin females. However, in a more recent study, Furnham, Moutafi and Baguma (2002) noticed that weight alone was not the universal for the perception of attractiveness.

Furnham et al. (2002) investigated cross-culturally the effect of both WHR and weight on body attractiveness. For this purpose three countries were selected: Greece, England, and Uganda. The number of participants for each country's sample was 106; 86 and 116 respectively. Results reported in this research showed that the European sample preferred 0.7 WHR as assumed by Furnham et al. (2002) and previously suggested by Singh (1993). However, Uganda's subjects preferred a WHR of 0.5. The authors explained Uganda's result by Africans preferences for large figures. The authors noted that research in the field of body attractiveness so far has been limited due to the availability and type stimulus material. As a recommendation, Furnham et al. (2002) suggested using 3-D representation of body images.

Haavio-Mannila and Purhonen (2001) studied the relationship between BMI and self-rated sexual attractiveness in Finland and St. Petersburg (Russia). They found that in both countries there is a stronger relationship between BMI and sexual attractiveness for

women than men. Slim people rate themselves as more sexually attractive than heavy ones. However, there were no significant relationships between BMI and sexual attractiveness in the Russian males.

Summary

In contrast to Western countries, the perception of body attractiveness in developing societies is different. Standards of beauty may be correlated with various indicators such as average temperature, food supply, food storage mechanism, male preferences, sociocultural preferences, dominance of women and men, as well as economic importance, capability of childcare, and socioecological variables.

Considering that the rate of overweight and obese individuals is very high in the U.S.A. and Russia, and, in addition, both countries passed through different economical and physiological changes, it is logical to examine the perception and preferences of beauty of these cultures. Testing people's perceptions of body attractiveness cross-culturally is important to better understand the role of cultural preferences for body size and body shape. Understanding differences and similarities for both cultures will provide global insights into understanding and analyzing perceptions of attractiveness within different sociocultural environments.

Images produced by body scanners have remarkable potential in analyzing body shape and examining the perception of body attractiveness. As a new technology used of body scan images has no wide implementation in the perceptual field. This study represents one of the first studies using image produced by body scanning.

III. METHODOLOGY

The purpose of this thesis was to investigate the perception of attractiveness and body size, and body shape across two cultures. Female student samples from the U.S. and Russia were selected to rate a stimulus composed of 27 images of 3D body scans of women. Body Mass Index (BMI) was used to categorize body sizes as underweight, normal, and overweight. Within the 27 female body scans in the stimulus, whole body shape was identified as hourglass, rectangle, and pear shapes were defined as basic body shapes for this study.

Sample

Female subjects were recruited from the U.S. and Russia. The female students from Auburn University ranged in age from 18-23 with one respondent over 25. The second group of subjects was female students from several universities in Moscow, all within the ages of 18–24. As in the American sample, there was only one respondent over 25. These groups composed convenience samples of student populations from each country.

Students from Auburn University were selected from classes within the College of Human Sciences' with support of class instructors. *Simonian & Associates Consulting*

Inc. (a consulting company based in North Miami Beach, FL) and *Active Marketing Agency* (Moscow, Russian Federation) recruited the sample and collected data in Russia.

Description of the Research Instrumentation

The same procedures and instruments were used for both groups. The instrument consisted of a questionnaire and a stimulus with a visual presentation developed in a Power Point format and projected onto a screen. The questionnaire was developed in English. The Russian questionnaire was translated by the researcher. An independent bilingual expert translated the Russian version back into English to ensure accuracy of the translation. The original English version was compared with back-translated English version by the researcher and minor discrepancies were identified and corrected.

Cross-cultural research can suffer from bias. Any kind of bias can threaten a study's validity. There are three possible bias sources in cross-cultural research: (1) construct, (2) method and (3) item bias (Van de Vijier & Tanzer, 1999). Construct bias occurs when the construct measured is not identical for all groups. Method bias can derive from not using a comparable sample, and not administering the research activity in the same way. Item bias can result from anomalies at the item level, for instance, improper translations. To avoid construct and item bias, the accuracy of the translated version of the questionnaire was checked with the back-translation strategy. To avoid *method* bias the same procedure was used to collect data in Auburn and Moscow.

The questionnaire was divided into four sections (See Appendix B and C). Section 1 captured the respondents' opinions on the attractiveness of 27 body images presented on the screen. A 5-point Likert scale ranging from 1 to 5, with 1 being *very*

attractive and 5 *very unattractive* was used. Figure 8 presents the BMI and shape distribution of all scans.

Figure 8: BMI and shape distribution of body scans

		Shape		
		<i>Pear</i>	<i>Rectangle</i>	<i>Hourglass</i>
Total = 27	<i>Normal</i>	3	3	3
	<i>Underweight</i>	3	3	3
	<i>Overweight</i>	3	3	3

Twenty-seven scans (nine hourglass, nine pear, and nine rectangle, three in each of the following BMI categories: underweight, normal, and overweight) were presented on a screen as a stimuli for participants to rate attractiveness.

Section 2 investigated respondents' perceptions of the body size of the 27 images shown on the screen. This section consisted of questions to examine the size perceptions of the 27 images presented in the stimulus. For each scan shown, respondents could select from the three possible answers (underweight, normal, and overweight). Upon viewing each image, the respondents were asked to select the category for the body size that most reflected their perception of the body size represented in each scan.

Section 3 requested information on the respondents' demographics and included questions related to each individual's personal profile to verify age, race, area of study, exercising frequency, fashion magazine reading frequency, and self-description of weight

and height. For the Russian sample questions on race, weight and height were modified according to the demographic specifics of Moscow and were based on the metric system. These questions were asked in order to calculate each subject's BMI level for analysis.

Section 4 consisted of questions about participant's self-appearance and their feelings about it. This section investigated participant's personal perceptions of their own body size, and attractiveness as well as their opinion about other's perceptions of their body.

Stimulus

The body images used in this study were selected from data set of 204 body scans archived in the BMS software program at the Department of Consumer Affairs at Auburn University. The scans were obtained from [TC]². All 204 body scans in the BMS software were shown in the form of a point cloud color image.

Body scans for this study were selected based on the BMI category and body shape identified for each scan (see Appendix 27). Selection was completed by the researcher and her major professors. Though the height of bodies in the scans varied from 5'4" to 5'7", they appeared to be almost the same height when projected on the screen. Twenty-seven body scans were selected to represent three BMI levels (underweight, normal, overweight) in three body shapes (hourglass, rectangle, pear). Within each BMI category three body shapes were classified as follows: three underweight/hourglass figures with BMI's of 16.8; 16.9; 17.4; three underweight/pear shape figures with BMI's of 16.9; 16.9; 17.1, three underweight/rectangle with the BMI of 17.2; 17.2; 17.3, three normal/hourglass figures with BMI's of 22.54; 21.52; 23.65. There were 9 normal scans

with three normal/pear shape with BMI's of 21.52; 20.49; 23.45, three normal/rectangle with BMI's of 20.42; 22.36; 21.7. Scans in the overweight category include three overweight/hourglass figures with BMI's of 26.78; 26.28; 28.05, three overweight/pear shape figures with BMI's of 27.1; 26.16; 29.22, and three overweight/rectangle figures with BMI's of 25.98; 25.79; 29.33. Scans that showed minimal right to left asymmetry were chosen. All the scans were shown randomly, in no particular order of BMI levels or body shape.

Description of the Procedures

The questionnaire was administered in on-site locations for both samples. For the American sample, the researcher administrated the questionnaire. An employee of *Active Marketing Agency* collected data for the Russian sample. For the Russian administration the researcher developed packets including the questionnaire and related information concerning survey procedures (see Appendixes B, C, and D). These packets were distributed to all participants along with instructions for completing the survey. Respondents were given enough time to read the instructions. In addition, the administrator of the survey explained the procedure in the relevant language and answered any respondent questions. After the question and answer session, the administrator started showing the images used as stimulus on the screen and asked the participants to answer the questions in each of the relevant sections. Body images were presented randomly (e.g. any body shape in any BMI level).

Data were collected in two sessions in the American sample. The process of data collection took approximately twenty minutes. Data for the Russian respondents were collected in four sessions. Each session was accomplished in 25 minutes.

Data Analysis

For data analyses, the researcher first calculated the BMI level for each respondent using the information provided in Section 3 where the respondents reported information on their height and weight. This information was coded and entered as data in the Statistical Package for the Social Sciences (SPSS 13). The researcher then coded each variable numerically, merged the data according BMI categories (e.g. grouped data for each BMI category), body shapes (e.g. grouped data for each body shape), and sample type (e.g. Americans or Russians).

Demographic profiles for the two groups were analyzed separately using frequency distributions. To determine the effects of BMI, body shape and sample difference on the perceptions of attractiveness of 27 body scans, a 2 x 3 x 3 (“2” types of groups: Americans and Russians; “3” body shapes: hourglass, rectangle, and pear; and “3” perceived body size: underweight, normal, and overweight) between subject design of factorial Analysis of Variance (ANOVA) between subjects factorial design was used. Cross tabulations with a chi-square test were performed to verify the significant relationships among the variables for each sample.

Each research question was analyzed using the methods.

1. *Are there differences between American and Russian female students' perceptions of the attractiveness of women's bodies?*

This question explored whether there was a significant difference between the two samples. Factorial ANOVA analysis and cross tabulations with Pearson's chi-square tests were used to analyze this research question.

2. *Is there a difference between perceptions of attractiveness among body shapes (hourglass, rectangular, and pear) for American and Russian female students?*

Two groups (American and Russian female students) and three body shapes (hourglass, rectangular, and pear) were the independent variables and attractiveness was the dependent variable. Using attractiveness scores as dependent variable, 2 X 3 between subjects design ("2" group type, "3" body shapes) factorial ANOVA-analysis was conducted. The perception of attractiveness among all three body shapes for each group was calculated, and then parameter estimates were measured to see if there were differences among perceptions of attractiveness for three body shapes between groups (Americans and Russians).

3. *Is there a relationship between perceptions of attractiveness and body size for American and Russian female students?*

For these analyses the independent variables were Americans and Russians and body size (underweight, normal, overweight). Attractiveness was the dependent variable. Factorial ANOVA-analysis design 2 X 3 ("2" group type, "3" body size) was used to

determine if there were any differences among all three body sizes between American and Russian female students.

4. *Are there any differences between American and Russian female students' perceptions of women's body sizes?*

The second section of the questionnaire asked respondents to look at each image and indicate their perception of body size selecting from underweight, normal, and overweight. This categorical data was used to analyze research question four. For this purpose factorial ANOVA-analyses and cross-tabulation with Pearson's chi-square tests were performed.

5. *Does body shape (hourglass, rectangular, and pear) influence American and Russian students' perceptions of three body sizes (underweight, normal, and overweight) in both samples?*

To determine the effect of body shape, on the body size perceptions of 27 body scans, a 2 X 3 ("2" types of groups: Americans and Russians; "3" body shapes: hourglass, rectangle, and pear) factorial ANOVA-analyses design was performed.

6. *Is there a relationship between American and Russian students' personal BMI scores and their perceptions of body size (underweight, normal and overweight) in both samples?*

To examine the effect of respondents personal BMI category on their perception of body size, 2 X 3 (“2” group types, “3” personal BMI categories) between subjects design of factorial ANOVA and cross-tabulation with chi-square analysis was calculated. BMI scores of participants were calculated from the height and weight information obtained from Section 3 of the questionnaire and placed in the appropriate BMI category and placed. The BMI categories were underweight (< 18), normal (19 to 25) and overweigh (25 to 30). The sets of body sizes were underweight (nine scans), normal (nine scans), and overweight (nine scans).

7. Is there a relationship between American and Russian students’ personal BMI scores and their perceptions of body attractiveness?

To determine the effect of respondents personal BMI and their perceptions of attractiveness of 27 body scans between Americans and Russians, ANOVA test was used. Additionally cross-tabulation with chi-square test were performed to separately estimate if there was a relationship between perceptions of attractiveness and personal BMI score for American and Russians students.

IV. DATA PRESENTATION AND ANALYSIS OF RESULTS

The purpose of this study was to investigate American and Russian female students' perceptions of female body attractiveness and body size, particularly in relation to body shapes and sizes. Participants for the study were drawn from Russia and the US. The research was conducted in the same manner in both places. A questionnaire developed by the researcher and her major professors was used as the instrument. The students in the US were presented with the English version of the questionnaire. For the Russian sample, a Russian translation of the questionnaire was used.

Demographic Profiles of the Respondents

In total, 209 respondents participated in this study (107 Americans and 102 Russians). Demographic questions were presented in Section 3 and Section 4 of the questionnaire to obtain a profile of the respondents. The following tables illustrate frequencies and percentages of demographic characteristics of American and Russian respondents. The demographic characteristics include: age and race for American respondents, age and nationality for Russian respondents, major or field of study, exercise frequency, fashion magazine reading frequency, height, weight, self-perception of personal body attractiveness and size, as well as perceptions of how others view the respondent's personal body attractiveness and size.

Age

Table 3 demonstrates the age distribution of American and Russian respondents. The mean age of American respondents was 20.39. The largest percentage of American respondents was in the 21 year-old age group (29.9%). The next highest percentage for the same sample was the 20 year-old group (28%). Only one respondent was over 25 years old (0.9%).

The mean age of Russian respondents' was 23.22. The 19 and 20 year-old age groups for Russian respondents represented the highest percentages (25.5% and 20.6% respectively). There was only one representative for ages 18 and over 25.

Table 3

Age of the Respondents

Age	Americans		Russians	
	Frequency	%	Frequency	%
18	12	21.1	1	1
19	13	12.1	26	25.5
20	30	28.0	21	20.6
21	32	29.9	18	17.6
22	15	14.0	13	12.7
23	4	3.7	10	9.8
24	-	-	12	11.8
Over 25	1	0.9	1	1
Total	107	100	102	100

Race or Nationality

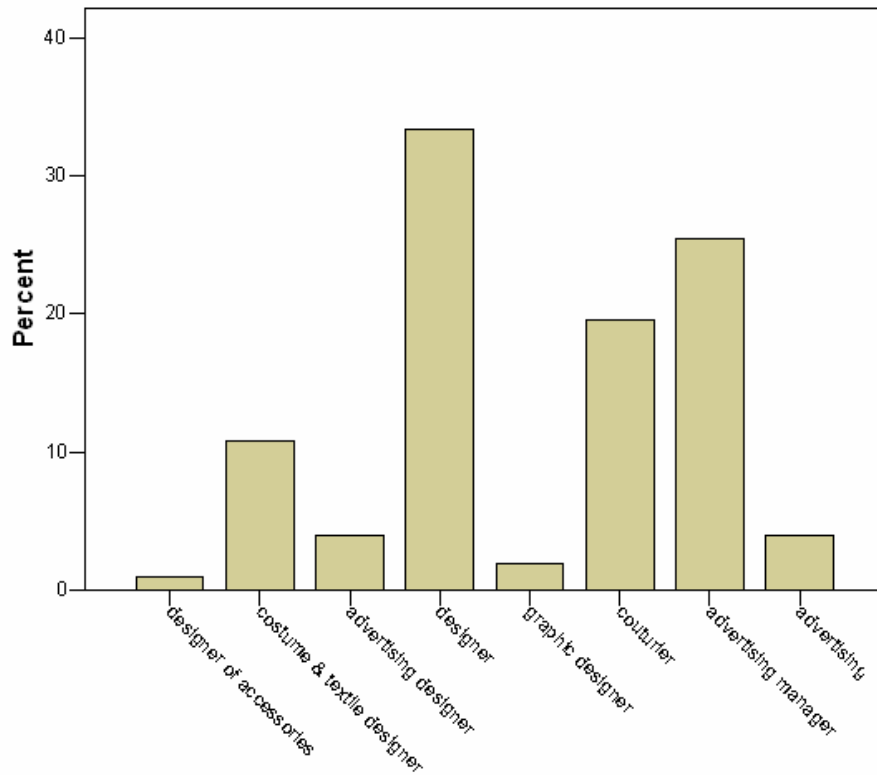
The majority of American respondents were Caucasians (92.5%). African Americans and Hispanics represented 5.7% and 0.9% respectively. There was only one respondent who indicated American Indian as her race (0.3%).

The Russian sample was composed mainly of Russians (88.2%). Tatars and Ukrainians represented 3.9% and 1.0% respectively. The rest (6.9%) of respondents answered as “other.”

Major or Field of Study

Subjects in the American sample were selected from students in classes for the Apparel Merchandising, Design and Production Management major, offered in the Department of Consumer Affairs, Auburn University. Russian respondents were selected from different universities in Moscow, and their study fields represented eight categories. The largest groups were students listing “designer” (33.3%) and “advertising manager” (25.5%) majors. The range of Russian majors reflected career options similar to those for the American sample. Distribution of the Russian respondents by majors is presented in Figure 9.

Figure 9. Distribution of Majors of Russian Respondents



Exercising Frequency

Table 4 illustrates the exercising frequency distributions for the two groups.

Almost 48.6% of American respondents reported exercising 2-3 times a week. More than 26% of American respondents did not exercise at all. More Russian (62.7%) respondents reported exercising 2-3 times a week. The group that did not exercise at all represented 23.5% of the Russian group.

Table 4

Exercising Frequency of American and Russian Respondents

Timing	Americans		Russians	
	Frequency	%	Frequency	%
None	28	26.2	24	23.5
2-3 times a week	52	48.6	65	62.7
4-5 times a week	21	19.6	9	8.8
6-7 times a week	6	5.6	5	4.9
Total	107	100	102	100

Fashion Magazine Reading Frequency

Table 5 shows fashion magazine reading frequencies for both samples. The numbers demonstrate that a majority of American students read fashion magazines either once a week (37.4%) or 2-3 times a week (34.6%). The highest corresponding frequency (40.2%) for Russian students was once a month.

Table 5

Fashion Magazine Reading Frequency

Timing	Americans		Russians	
	Frequency	%	Frequency	%
None	1	0.9	6	5.9
Everyday	10	9.3	9	8.8
2-3 times a week	37	34.6	18.6	18.6
Once a week	40	37.4	27	26.5
Once a month	19	17.8	41	40.2
Total	N=107	100	N=102	100

BMI Level

Using respondents' self-reported data on weight and height, their BMI values were calculated. To calculate BMI in English and Metric Systems, formulas offered by the U.S. Center for Disease Control were used.

$$\text{BMI} = \frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \times 703$$

$$\text{BMI} = \frac{\text{Weight in Kilograms}}{(\text{Height in Meters})^2}$$

Source: CDC Web page

Table 6 illustrates the BMI distribution of American and Russian respondents. More than 75% of the American respondents fell into the normal BMI category. Underweight (<18) and overweight (25-30) groups represented 20.6% and 3.7% respectively. More than one-half of the Russian respondents (56.9%) had normal BMI. The underweight group was 37.2%, and the overweight group was 5.9%.

Table 6

BMI Distribution of American and Russian Respondents

	Americans	Russians
BMI categories	%	%
Underweight	20.6	37.2
Normal	75.7	56.9
Overweight	3.7	5.9

Body Image: Size and Attractiveness

Table 7 shows respondents' perceptions of their own attractiveness. More than 54% of the American respondents were neutral about their attractiveness. More thought that they were attractive (29%) and 5.6% rated themselves as unattractive. However, 52% of Russian respondents rated themselves as attractive and 21.6% as very attractive. Only 2% of the Russian respondents thought they were very unattractive.

Table 7

Respondents' Perceptions of Their Own Attractiveness

Ratings	Americans		Russians	
	Frequency	%	Frequency	%
Very attractive	12	11.2	22	21.6
Attractive	31	29.0	53	52.0
Neutral	58	54.2	22	21.6
Unattractive	6	5.6	3	2.9
Very unattractive	-	-	2	2.0
Total	107	100	102	100

Table 8 shows respondents' personal feelings about their body size. The majority of the American and Russian respondents rated themselves as having normal body size. A relatively larger percentage of Russian respondents thought that they were overweight (19.6%) and underweight (9.8%). These values were different from the actual BMI values for both American and Russian students. Both nationalities tended to see themselves as more overweight and less underweight than in reality.

Table 8

Respondents' Own Body Size Estimations

BMI Categories	Americans		Russians	
	Frequency	%	Frequency	%
Underweight	4	3.7	10	9.8
Normal	93	86.9	72	70.6
Overweight	10	9.4	20	19.6
Total	107	100	102	100

Table 9 represents respondents' perceptions of how others rate their attractiveness. Almost half of the American respondents (47.7%) thought others would be neutral about their attractiveness. However, 46.1% of Russian respondents thought that others would rate their overall body image as attractive. These values were similar to the respondents' self-perceptions.

Table 9

Perceptions of Others' Rating of Respondents' Body Image

Ratings	Americans		Russians	
	Frequency	%	Frequency	%
Very attractive	11	10.3	31	30.4
Attractive	39	36.4	47	46.1
Neutral	51	47.7	18	17.6
Unattractive	6	5.6	4	3.9
Very unattractive	-	-	2	2.0
Total	107	100	102	100

Table 10 shows respondents' perceptions of others' views of their body size. The majority of both American (86.0%) and Russian (70.6%) respondents thought that others would perceive their body size as normal. These percentages were almost the same as the respondents' self-perceptions (see Table 8).

Table 10

Perceptions of Others' Rating of Respondents' Body Size

Size	Americans		Russians	
	Frequency	%	Frequency	%
Underweight	10	9.3	15	14.7
Normal	92	86.0	72	70.6
Overweight	5	4.7	15	14.7
Total	N=107	100	N=102	100

Analysis of Research Questions

To analyze the data, it was necessary to view it in the following way: Perception of attractiveness was the dependent variable, and three independent variables were (a) nationality (Americans and Russians), (b) body size of the viewed body scans (normal, overweight, and underweight) and, (c) body shapes of the viewed body scans (hourglass, rectangle, and pear shape).

Research question 1

Research Question 1: Are there differences between American and Russian female students' perceptions of the attractiveness of women's bodies?

Factorial Analysis of Variance (ANOVA) and cross tabulations with Pearson's chi-square tests were used to analyze this research question. The chi-square statistical test was conducted to determine if the difference between American and Russian students

was significant. If a chi-square probability is .05 or less it is commonly interpreted by social scientists as justification for rejecting the null hypothesis that the row variables are not related to the column variables (Levin, 1999).

The first section of the questionnaire asked respondents to look at each image and indicate their perception of attractiveness using 5-point Likert scale from 1 as *very attractive* to 5 as *very unattractive*. The results of factorial ANOVA-analyses are presented in Table 11. The results revealed a main effect of group type (Americans and Russians) characteristics ($F = 112.396$). The main effect was significant ($p = .000$).

Table 11

Comparison of Americans' and Russians' Attractiveness Ratings

	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Variables				
Americans vs. Russians	1	148.447	112.396	.000*

Note. Significant *F* value is noted by: * $p < .01$

Table 12 shows the mean scores of attractiveness ratings provided by American and Russian students. These mean scores show that Russian students gave lower scores for attractiveness ($M = 3.697$) than American students ($M = 3.274$).

Table 12

Mean Scores of American and Russian Students' Attractiveness Ratings

Sample	<i>M</i>
Americans	3.274
Russians	3.697

To see how different was the perceptions of the two groups, the effect size is revealed in Table 13. Results reported in Table 13 show that the difference in perceptions of attractiveness was -.325, where Russians were considered as reference category. The coefficient difference of -.325 can be explained as follows: Russian students generally perceived body images as less attractive than American students by .325. This difference was statistically significant ($p = .000$, with $SE = .031$).

Table 13

Difference between American and Russian Students' Attractiveness Ratings

Parameter	<i>B</i>	<i>SE</i>	<i>p</i>
Americans vs. Russians	-.325	.031	.000*

Note. Significant F value is noted by: * $p < .001$

Cross tabulation with chi-square test results shown in Table 14 indicate there was a relationship between dependent and independent variables ($p = .000$). In this case, Americans and Russians were categorical independent variables, and perception of

attractiveness was a categorical dependent variable. The results confirmed that perception of attractiveness depended on sample difference (Americans or Russians).

Table 14

Cross Tabulations for American and Russian Students' Perceptions of Attractiveness

Rating	Americans	Russians	Total	Chi ²	<i>p</i>
Very attractive	164	79	243		
Attractive	566	360	926		
Neutral	777	658	1435	111.949	.000*
Unattractive	754	840	1594		
Very unattractive	627	817	1444		

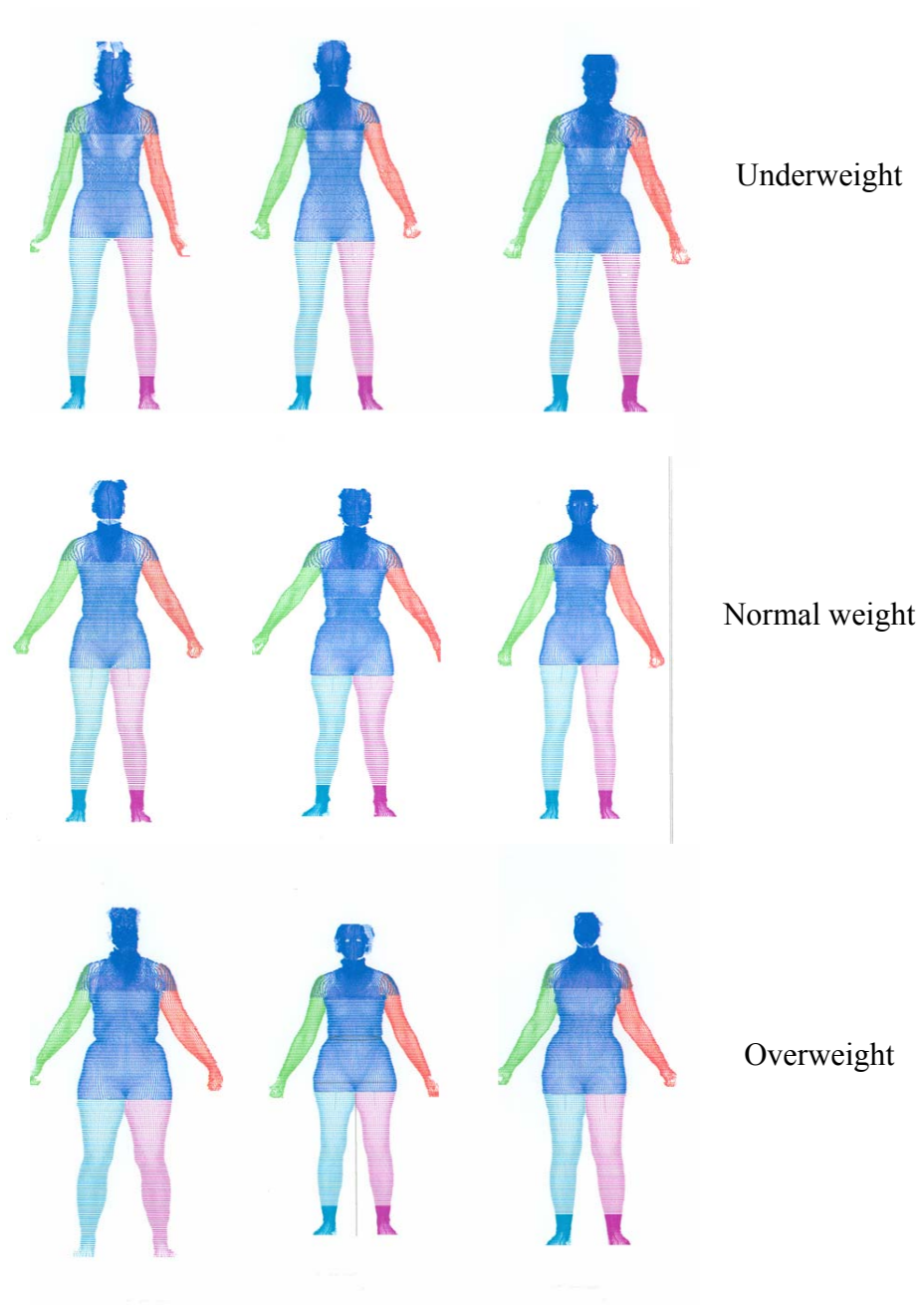
Note. Significant F value is noted by: * $p < .001$

Research Question 2

Research question 2: Is there a difference between perceptions of attractiveness among body shapes (Hourglass, rectangular, and pear) for American and Russian female students?

To see if there was a difference in groups' perceptions of attractiveness among body shapes, perceptions of attractiveness among all three body shapes were separately analyzed for each group. For this purpose, body scan images (see Figure 11) were sorted out according to body shape (9 hourglass, 9 rectangle, 9 pear shape).

Figure 10. Scanned Body Images of Women for Pear Shape



Each body image was assigned a number according to the presented order of scans. This information was arranged in a table according to body shape and BMI category order (see Table 15). The data were then restructured according to shape types. For instance, data were grouped for pear shape using the attractiveness ratings for scans No. 1, 12, 17, 8, 2, 11, 7, 15, and 10. The same approach was done for rectangle and hourglass body shapes.

Table 15

Scan Images Categorized According to BMI and Body Shape

BMI category	Rectangle		Hourglass		Pear shape	
	No.	BMI	No.	BMI	No.	BMI
Underweight	4	17.27	19	16.97	7	16.97
	9	17.3	26	16.82	15	17.13
	23	17.27	5	17.42	10	16.96
Normal Weight	13	20.42	22	22.54	1	21.52
	16	22.36	27	21.52	12	20.49
	25	21.7	24	23.65	17	23.45
Overweight	6	25.8	14	26.78	8	27.1
	21	25.79	18	26.28	2	26.16
	3	29.33	20	28.05	11	29.22

Results of the factorial ANOVA test are shown in Table 16. The test results showed that group difference factor (Americans vs. Russians) influenced perceptions of attractiveness more ($F = 113.023$) than the shape factor ($F = 14.122$). There was more difference in the perceptions of attractiveness among shapes between Americans and Russians ($F = 14.122$) than among Americans and Russians together ($F = 2.406$). Within body shape groups, the difference among Americans and Russians together was not significant ($p = .09 > .05$). It was significant between Americans and Russians ($p = .000$).

Table 16

Effect of Body Shape and Nationality Difference on Perceptions of Attractiveness

Parameter	<i>df</i>	<i>F</i>	<i>p</i>
Americans vs. Russians among all	1	113.023	.000*
scans	2	14.122	.000*
Americans vs. Russian among	2	2.406	.090
shapes			
Americans and Russians among			
shapes			

Note. Significant F value is noted by: * $p < .001$

Table 17 illustrates mean scores of American and Russian students' perceptions of attractiveness among body shapes of the presented scans. As it is shown in Table 17, the mean scores of attractiveness rating among all three body shapes were different.

Remembering that 1 indicated *very attractive* and 5 *very unattractive*, it can be interpreted that Russians' mean scores in all body shapes were higher than Americans. This means that Russian students saw body scans as being less attractive in all shapes than American students. Both Russians and Americans perceived pear shapes to be least attractive and hourglass shapes to be most attractive.

Table 17

Mean Scores of American and Russian Students' Perceptions of Attractiveness of

Body Shapes

Sample	Shape	<i>M</i>
Americans	Pear	3.381
	Hourglass	3.141
	Rectangle	3.303
Russians	Pear	3.782
	Hourglass	3.650
	Rectangle	3.713

To see if the difference between Americans and Russians within each body shape group was significant, test results were analyzed for parameter estimates (see Table 18). This table shows these more detailed results. Table 16 showed that there were significant differences in attractiveness scores among body shape groups between Americans and Russians. In Table 18, values between Americans and Russians are shown to not be very

different for each shape. American students perceived pear shape body scans as more attractive by .022 than Russian students; this difference was not statistically significant ($p = .768$). The picture was different only for the hourglass body shape. Russian students, on average gave lower ratings (higher unattractiveness) to hourglass bodies by .152 than their American peers. In this case the difference was statistically significant ($p = .042$).

Table 18

Difference of Attractiveness Rating Between Americans and Russians for each

Body Shape

Variables	Shape	<i>B</i>	<i>p</i>
Am. vs. Russ.	Pear shape	-.022	.768
Am. vs. Russ.	Hourglass	-.152	.042*
Am. vs. Russ.	Rectangle	0	.

Note. Significant F value is noted by: * $p < .05$.

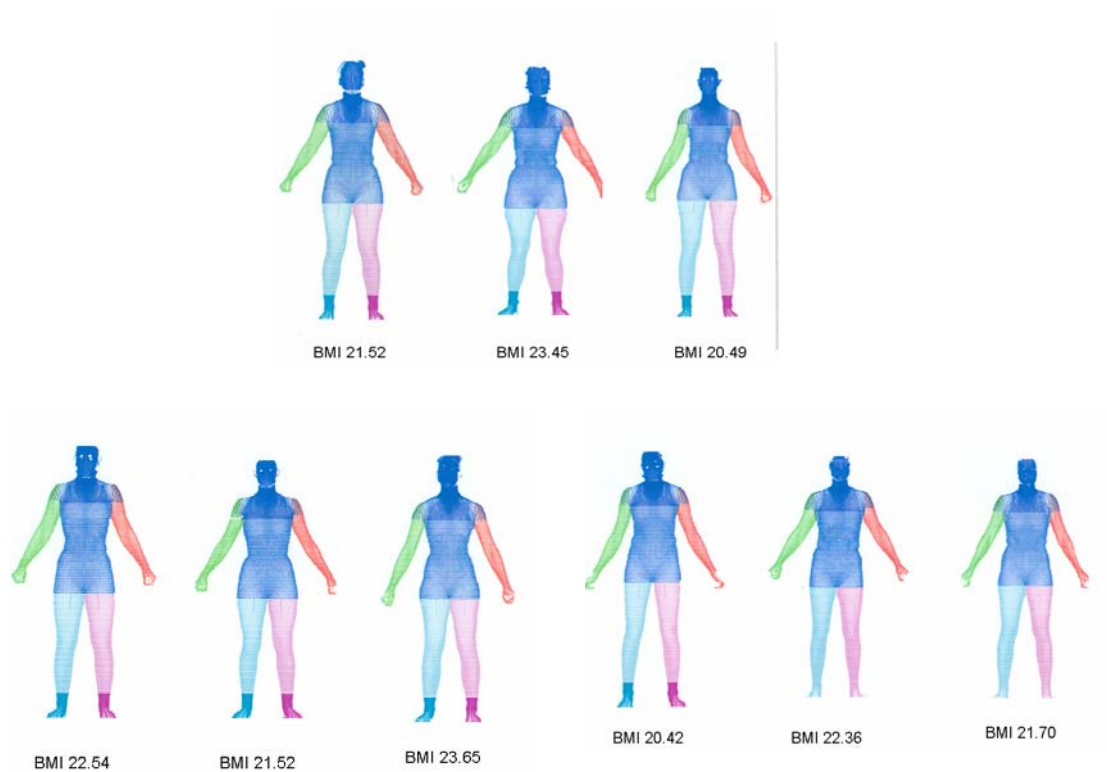
Thus, although there was significant difference in perceptions of attractiveness among body shapes, the only significant difference between Americans and Russians within each body shape was for the hourglass shape.

Research Question3

Research question 3: Is there a relationship between perceptions of attractiveness and body size for American and Russian female students?

To analyze this research question, the factorial ANOVA statistical test was performed employing a 2 X 3 between subject design (2 nationalities; 3 perceived body sizes: underweight, normal, and overweight). Body scan images (see Figure 12) were sorted according to BMI categories (9 underweight, 9 overweight, and 9 normal).

Figure 11. Body scans with Normal BMI.



Then data were grouped according to BMI categories. The reorganized data were used to determine if there was a relationship between perceptions of attractiveness and body size. The results presented in Table 19 show that, looking at Americans and

Russians together, body size ($F = 2088.860$) was significantly related to perceptions of attractiveness ($p = .000$). Analyses also revealed a significant effect for a difference between Americans' and Russians' perceptions of attractiveness of body sizes ($F = 38.435$, $p = .000$).

Table 19

Relationship between Perceptions of Attractiveness and Body Sizes

Parameter	<i>df</i>	<i>F</i>	<i>p</i>
Americans and Russians	2	2088.860	.000*
Americans vs. Russians	2	38.435	.000*

Note. Significant F value is noted by: * $p < .001$.

Table 20 illustrates American and Russian students' mean attractiveness scores for body size categories. Mean attractiveness scores were different for each body size, and they were different for American and Russian students. Since 1 indicated *very attractive*, and 5 indicated *very unattractive*, Table 20 shows that Russians tended to rate scans as less attractive in each body size. It also shows that both Americans and Russians rated underweight scans as most attractive and overweight scans as least attractive.

Table 20

*Mean Scores of American and Russian Students' Perceptions of Attractiveness of**Body Sizes*

Sample	BMI categories	<i>M</i>
Americans	Underweight	2.379
	Normal	3.130
	Overweight	4.315
Russians	Underweight	3.065
	Normal	3.487
	Overweight	4.539

To see if the differences between Americans and Russians were significant within each body size, the results were analyzed for parameter estimates. Table 21 shows the relationship between perceptions of attractiveness among all three body sizes between the two groups. The .13 value difference between Russians and Americans was statistically significant ($p = .001$). Results in Table 21 also show that there was a significant difference ($p < .05$) among all values. Looking at Americans and Russians together and with overweight as the reference category, the coefficient for normal weight was 1.084 lower; the underweight was 1.570 lower. This means that American and Russian students perceived normal weight and underweight body scans to be significantly more attractive than overweight body scans ($p = .000$).

Table 21 also shows the results of comparing Americans and Russians within

body size groups. Americans perceived underweight bodies as significantly more attractive than Russians did ($p = .000$). Americans also perceived normal weight bodies to be significantly more attractive than Russians did ($p = .05$).

Table 21

Difference of Attractiveness' Perceptions for Each Body Size

Variables	BMI	B	Sig.
Americans vs. Russians		-	.001**
Am. and Russ.		.130	.000**
Underweight		-	.000*
Am. and Russ.	Normal	1.570	.
Am. and Russ.		-	.000*
Overweight		1.084	.050*
Am. vs. Russ.		0	.
Underweight		-	
Am. vs. Russ.	Normal	.474	
Am. vs. Russ.		-	
Overweight		.111	
		0	

Note. Significant F value is noted by: ** $p < .001$, * $p < .05$.

Research Question 4

Research question 4: Are there any differences between American and Russian female students' perceptions of women's body sizes?

The second section of the questionnaire asked respondents to look at each image and indicate their perception of body size using the options underweight, normal, and overweight. Underweight was given a representative value of 1, normal 2, and overweight 3. This categorical data was used to analyze research question 4. For this purpose, factorial ANOVA-analyses and cross-tabulation with Pearson's chi-square tests were performed.

The test results (see Table 22) indicated that there were significant differences ($p < .05$). Finding a significant interaction effect meant that a significant difference existed between the dependent variable of body size and the independent variables, Americans and Russians. American and Russian female students were different in their perceptions of the scans' body sizes.

Table 22

Comparison of Americans and Russians Body Size Ratings

Variable	Type II Sum of Squares	<i>p</i>
Americans vs. Russians	2.700	.012*

Note. Significant *F* value is noted by: * $p < .05$.

Table 23 shows that the mean value of the Russian sample was .044 higher than the mean value of the American sample. This difference was statistically significant ($p = .012$). Thus, Russian respondents generally viewed body scans as heavier than American respondents.

Table 23

Difference between Americans' and Russians' Body Size Ratings

Variable	<i>B</i>	<i>p</i>
Americans vs. Russians	-.044	.012*

Note. Significant F value is noted by: * $p < .05$.

Results of cross-tabulations with chi-square analysis show (see Table 24) significant differences between the two groups' (Americans and Russians) size estimations ($p = .000$). The numbers that indicated the total expected count for each group were calculated by multiplying the total number of each sample size and scans quantity (e.g. 107 Americans X 27 scans = 2888, 102 Russians X 27 scans = 2754). As shown in Table 24, perceptions for underweight body size composed only 591 responding, of which 48.1% were Americans, and 51.9% Russians. The majority of scans were perceived as normal weight (2591 = 1425 Americans (55%) + 1166 Russians (45%). Americans perceived underweight scans less accurately, whereas Russians perceived them more. The same was true for overweight images, but the opposite was the case for normal weight scans.

Table 24

Cross Tabulations with Chi-Square Comparison of Americans' and Russians' Perceptions of Body Size

Nationality groups		Body Size Estimations			Total
		Underweight	Normal	Overweight	
Americans	Count	284	1425	1180	2889
	Expected Count	302.5	1326.3	1259.2	28888.0
	%	48.1%	55.0%	47.9%	51.2%
Russians	Count	307	1166	1281	2754
	Expected Count	288.5	1264.7	1200.8	2754.0
	%	51.9%	45.0%	52.1%	48.8%
Total	Count	591	2591	2460	5642
	Expected Count	591.0	2591.0	2460.0	5642.0
	%	100.0%	100.0%	100.0%	100.0%

$\chi^2 = 27.848 \quad p = .000$

Note. Significant F value is noted by: * $p < .001$.

To see how accurately the American and Russian students saw the scans across body sizes, cross tabulation was conducted separately for each sample. Results in Table 25 indicate how American students perceived the body sizes of scans. The most correct

perceptions of American respondents were body scans with overweight BMI (94%) and normal BMI (73%) of. Underweight images were correctly identified by only 29% of American respondents. Most of the respondents (69%) viewed them as normal body size.

Table 25

American Students' Perceptions of Body Size

Actual BMI Category	Perceived Body Size		
	Underweight	Normal	Overweight
Underweight	29%	69%	2%
Normal	0%	73%	27%
Overweight	0%	6%	94%

Table 26 shows results for Russian respondents. Almost the same pattern can be identified for Russian students. The most correctly identified body sizes were for overweight (97%) and normal (60%) body images. In comparison to their American peers, Russians were slightly more accurate in their perceptions of underweight body images (32%), but less accurate in their perceptions of normal weight. Although 60% correctly viewed normal weight scans, 39% saw them as overweight.

Table 26

Russian Students' Perceptions of Body Size.

Actual BMI Category	Perceived Body Size		
	Underweight	Normal	Overweight
Underweight	32%	64%	4%
Normal	0%	60%	39%
Overweight	0%	3%	97%

Research Question 5

Research question 5: Does body shape (hourglass, pear shape and rectangle) influence American and Russian students' perceptions of three body sizes (underweight, normal, overweight) in both samples?

To determine the influence of body shape on body size perceptions of Americans and Russians, between subject factorial ANOVA design 3x2 (3 body shapes: rectangle, pear shape and hourglass; 2 nationalities: Americans and Russians) was conducted.

Test results presented in Table 27 show that mean values of Americans and Russians together were different from zero. Perception of body sizes was significantly influenced by body shapes of presented scans ($F = 6.390, p = .012$) for the two nationalities. However, there was no significant relationship between perceived body size and body shapes of scans when comparing Americans and Russians ($p = .230$).

Table 27

Effect of Body Shape on Perceptions of Body Size

Parameter	<i>df</i>	<i>F</i>	<i>p</i>
Americans and Russians	1	6.390	.012*
Americans vs. Russians	2	1.470	.230

Note. Significant F value is noted by: * $p < .05$.

Table 28 shows parameter estimates of Americans in comparison with Russians. Remembering that 1 was assigned value for underweight and 3 for overweight, the results suggested that the Russians tended to see images as heavier than the Americans. Although, there were differences among all shape values, a significant difference was found only for pear shape ($p = .000$) for Americans and Russians together. Rectangle shape was the reference factor. There were no significant relationships when Americans and Russians perceptions of body size were compared ($p = .175$, $p = .113$)

Table 28

Effect of Each Body Shape on Perceptions of Body Sizes

Variable	Shape	<i>B</i>	<i>p</i>
Americans and Russians	Pear	.192	.000*
Americans and Russians	Hourglass	.05556	.067
Americans and Russians	Rectangle	0	.
Americans vs. Russians	Pear	.05750	.175
Americans vs. Russians	Hourglass	.06730	.113
Americans vs. Russians	Rectangle	0	.

Note. Significant F value is noted by: * $p < .001$.

To see the relationship of each body shape with perceived body size in each group factorial ANOVA test was performed separately for both groups. The results are presented in Table 29. When the analysis was split for Americans and Russians, most results were statistically significant ($p < .01$), meaning that body shapes influenced perceived body sizes for both American and Russian students. The one exception was that for Russian respondents, results for the hourglass body shape were not significant. A significant relationship was found between all body shapes and perceived body sizes in the American sample. Thus, for Russian students, perception of size was related to having rectangle or pear shape. For American students, perception of size was related to having pear, rectangle, or hourglass shapes.

Table 29

Effect of Each Body Shape on Perceptions of Body Sizes within Each Nationality

Participants	Parameter	<i>B</i>	<i>p</i>
Americans	The whole set	2.186	.000*
	Pear	.249	.000*
	Hourglass	.123	.000*
	Rectangle	0	.
Russians	The whole set	2.271	.000*
	Pear	.192	.000*
	Hourglass	.05556	.075
	Rectangle	0	.

Note. Significant F value is noted by: * $p < .001$.

Research Question 6

Research question 6: Is there a relationship between American and Russian students' personal BMI scores and their perceptions of body size in both samples?

To see whether participants' own body size affected their ratings of scans' attractiveness, factorial ANOVA test was conducted using 2 X 3 (2 nationalities: Americans and Russians, 3 personal BMI categories: normal, overweight, underweight) between subjects design. In addition, cross-tabulation with chi-square analysis was performed. The sets of body sizes were normal (nine scans), underweight (nine scans), and overweight (nine scans). The BMI scores of participants were calculated from the

self-reported height and weight information obtained from Section 3 of the questionnaire. The metric system was used for the Russian version, and the English system was used for the American version of the questionnaire. Participants were categorized by their BMI scores as underweight (< 19), normal (19.1 to 25), or overweight (25.1 to 30).

Results of the factorial ANOVA test are presented in Table 30. There was no significant effect of respondents' personal body size on their perceptions of body size categories. The same results were reported in parameter estimates analysis (see Table 31). Results showed that although there were some coefficient differences among scores, none of them were significant. Also, results of between groups showed no significant difference between Americans and Russians.

Table 30

Effect of Personal BMI scores on Perceptions of Body Size for American and Russian Students

Variable	<i>df</i>	<i>F</i>	<i>p</i>
Body size and Personal BMI	2	.324	.723

Table 31

*Differences in Perceptions of Body Size According to Each Personal BMI**Category*

Parameter	Size	<i>B</i>	<i>p</i>
Americans vs. Russians	All sizes	.02596	.975
Americans' and Russians' BMI	Underweight	.09454	.088
	Normal	.07152	.187
	Overweight	0	.
Americans vs. Russians	Underweight	-.026	.765
Americans vs. Russians	Normal	-.051	.546
Americans vs. Russians	Overweight	0	.

To see if there was a significant association between respondents' personal BMI scores and their perception of body size separately in each sample, cross-tabulations with chi-square test were performed. Table 32 shows the results, which confirmed that there were no significant relationships between participants' personal BMI scores and their perceptions of body size in any group.

Table 32

*Relationships of Respondent's Personal BMI Scores and Their Perceptions of**Body Size*

Students'		Body Size Estimations			Total
Personal BMI		Underweight	Normal	Overweight	
<u>Americans</u>					
Underweight	Count	57	273	264	594
	Expected Count	58.4	293.1	242.5	594.0
	%	20.1%	19.2%	22.4%	20.6%
Normal	Count	215	1099	873	2187
	Expected Count	215.1	1079.1	892.8	2187.0
	%	75.7%	77.1%	77.0%	75.7%
Overweight	Count	12	53	42	107
	Expected Count	10.5	52.8	43.7	107.0
	%	4.2%	3.7%	3.6%	3.7%
				$x^2 = 4.398$	$p = .355$
<u>Russians</u>					
Underweight	Count	101	442	483	1026
	Expected Count	114.4	434.4	477.2	1026.0
	%	32.9%	37.9%	37.7%	37.3%
Normal	Count	183	653	730	1566
	Expected Count	174.6	663.0	728.4	1566.0
	%	59.6%	56.0%	57.0%	56.9%
Overweight	Count	23	71	68	162
	Expected Count	18.1	68.6	75.4	162.0
	%	7.5%	6.1%	5.3%	5.9%
				$x^2 = 4.483$	$p = .345$

Research Question 7

Research question 7: Is there a relationship between American and Russian students' personal BMI scores and their perceptions of body attractiveness?

To analyze this question, the researcher again used information gathered from the Section 3 of the questionnaire, where the respondents reported their height and weight information. This information was used to calculate BMI scores for each respondent and categorize them according to the three BMI categories. To determine the effect of respondents' personal BMI on their perceptions of body attractiveness, factorial ANOVA test was performed using 2 X 3 (2 nationalities: Americans and Russians, 3 personal BMI categories: normal, overweight, underweight) between subjects design. Additionally, cross-tabulation with a chi-square test was performed to estimate if there was a relationship between perceptions of attractiveness and personal BMI score for American and Russian students when viewed separately.

Results of the ANOVA test are presented in Tables 33 and 34. These results show that there was a significant difference between American and Russian students' perceptions of attractiveness relative to their own BMI scores ($F = 4.497, p = .011$).

Table 33

Effect of Personal BMI Score on Perceptions of Attractiveness

Parameter	<i>df</i>	<i>F</i>	<i>p</i>
Americans vs. Russians	2	4.497	.011*

Note. Significant F value is noted by: * $p < .05$.

Table 34 shows attractiveness estimations relative to respondents' BMI scores between the two nationalities. The results for each BMI category in Table 34 show no significant differences in any single BMI category for Americans and Russians together. When comparing Americans and Russians, there were significant differences. Americans with underweight BMI scores perceived all body scans to be more attractive by .461 than Russians with the same BMI ($p = .003$). American students with normal BMI perceived body scans as more attractive by .377 than Russian students with normal BMI scores ($p = .011$).

Table 34

Differences in Body Attractiveness Perceptions between Americans and Russians in Relation to Their Personal BMI Category

Parameter	BMI	<i>B</i>	<i>p</i>
Respondents' BMI	Underweight	-.092	.344
	Normal	-.004	.964
	Overweight	0	.
Americans vs. Russians	Underweight	.461	.003**
Americans vs. Russians	Normal	.377	.011*
Americans vs. Russians	Overweight	0	.

Note. Significant F value is noted by: ** $p < .005$, * $p < .05$

To see if there was a significant relationship between respondents' personal BMI scores and their perceptions of attractiveness considering each group separately, a

factorial ANOVA test was performed together with cross tabulation with a chi-square test. Results of the cross tabulation with chi-square are presented in Table 35. The chi-square results were not significant for Russian students ($p = .330$) but were significant for American students ($p = .001$). This means that there were significant differences in perceptions of attractiveness of American students among different BMI categories.

Table 35

*Relationship of American and Russian Students' BMI Scores and Their**Perceptions of Attractiveness*

Participants	Ratings	Participants' BMI Categories			Total
		Underweight	Normal	Overweight	
<u>Americans</u>	Very Attractive	43	117	4	164
	Expected	33.7	124.1	6.1	
	%	26.2%	71.3%	2.4%	
	Attractive	110	426	30	566
	Expected	116.4	428.4	21.2	
	%	19.4%	75.3%	5.3%	
<u>Russians</u>	Neutral	143	593	41	777
	Expected	159.8	588.1	29.1	
	%	18.4%	76.3%	5.3%	
	Unattractive	164	565	25	754
	Expected	155.1	570.7	28.2	
	%	21.8%	74.9%	3.3%	
<u>Americans</u>	Very Unattractive	134	485	8	627
	Expected	129.0	474.6	23.4	
	%	21.4%	77.4%	1.3%	
	Very Attractive	34	42	3	79
	Expected	29.4	44.9	4.6	
	%	43.0%	53.2%	3.8%	
<u>Russians</u>	Attractive	155	183	22	360
	Expected	134.1	204.7	21.2	
	%	43.1%	50.8%	6.1%	
	Neutral	238	380	40	658
	Expected	245.1	374.2	38.7	
	%	36.2%	57.8%	6.1%	
<u>Americans</u>	Unattractive	303	492	45	840
	Expected	312.9	477.6	49.4	
	%	36.1%	58.6%	5.4%	
	Very Unattractive	296	469	52	817
	Expected	304.4	464.6	48.1	
	%	36.2%	57.4%	6.4%	

Note. Significant F value is noted by: * $p < .001$.

The results of attractiveness' ratings according to each BMI category done separately for each group (see Table 36) confirmed the results of the chi-square test that the relationship of personal BMI scores and perceptions of attractiveness was not significant for Russians and was significant for Americans. Table 34 shows that American students with underweight and normal BMI scores perceived body scans almost similarly attractive ($B = .370, .372$ respectively; *overweight* was considered as reference parameter), and these differences were significant ($p = .003; .001$).

Table 36

Attractiveness Perceptions of American and Russian students in Relation to Their

Personal BMI Category

Participants	Parameter	<i>B</i>	<i>p</i>
Americans	Underweight	.370	.003*
	Normal	.372	.001**
	Overweight	0	.
Russians	Underweight	-.092	.327
	Normal	-.004	.963
	Overweight	0	.

Note. Significant F value is noted by: ** $p < .001$, * $p < .001$.

V. SUMMARY, CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

This chapter summarizes the results of the study examining American and Russian female students' perceptions of female body attractiveness and size. It provides conclusions, as well as information on limitations, recommendations and implications for future research.

Summary

Study Design

Respondents for this study were selected from two different countries, the U.S.A. and Russia. The sample was composed of 107 American female students and 102 Russian female students. The majority of American respondents were between ages 20 and 21. Russian respondents were mostly between ages 19 and 20. Both samples consisted primarily of Caucasians. Caucasians composed 92.5% of the American sample, while 88.2% of the Russian sample was Russian. All of the American subjects were from the College of Human Sciences, selected from the Apparel Merchandising, Design and Production Management major. The Russian participants' study fields represented eight categories, all suggesting similar career options to those for the American sample. The most common major for Russian students (33.3%) was "designer." A majority of subjects in both samples had BMI scores in the normal range (75% Americans, 56.9% Russians). The Russian group had a larger percentage of subjects in the overweight (5.9%) and

underweight (37.3%) BMI range than the American subjects (3.7% and 20.6% respectively).

The instrument used for the survey consisted of a questionnaire with stimuli developed by the researcher and major professors. For the Russian sample, the questionnaire was translated into Russian by the researcher. An independent, bilingual expert translated the Russian version back into English to ensure correctness of the translation. The original English version was compared to the retranslated English version by the researcher, and minor revisions were made. The questionnaire was used to record responses to stimuli that consisted of 27 images of female bodies from the [TC]² body scanner.

In previous studies that aimed to research problems related to body attractiveness and size (Henss 1995, 2000; Singh, 1993, 1994a, 1994b; Tassinari et al, 1998), line drawings and color photographs of women were used as stimuli. More recent studies suggested that due to the poor representations of a human body in line drawings, the validity of the results might be compromised (Forestell et al., 2004). In this study, slides of body scan images were used as stimuli. The body images in this study were selected from the data sample of 204 body scans archived in the BMS software program at the Department of Consumer Affairs at Auburn University. These scans were obtained from the [TC]² Size USA data set. The BMS software presents each image as a point cloud projected in primary colors on a black background.

Most of the studies in the body attractiveness field considered WHR as a major body shape parameter (Forestell et al., 2004; Henss 1995, 2000; Singh, 1993; 1994a, 1994b; Tassinari et al, 1998; Tovee et al., 1998, 2001, 2002, 2003). In this study, body

shapes were defined by an expert system developed in the apparel science field (Connell et al., 2001) to categorize frontal views of whole body shape (See Appendix A). The stimuli for this study included body scans identified as hourglass, rectangle, and pear shapes. In addition to the variable of shape, the body scan stimuli also included scans categorized by BMI. The height of bodies represented in the scans ranged from 5'4" to 5'7". A total of 27 body scans were used as stimuli. Scans represented three BMI categories (underweight, normal, and overweight) in three body shapes (hourglass, rectangle, and pear). Scans were shown randomly, in no particular order of BMI categories or body shape.

Conclusions

Both American and Russian students tended to see themselves as more overweight and less underweight than in reality (see Table 37). Comparing self-rating numbers with BMI scores calculated from their self-reported heights and weights, it can be concluded that American and Russian students' real size was often lower than the perception they had of their size. It might be said that they were critical of their own size. How students saw themselves and how they thought others saw them was a closer match. When students were incorrect, they appear to have seen themselves and thought others saw them as larger than their BMI scores categorized them. Tovee et al. (2000) suggested that individuals' overestimation of their BMI would shift their perceptions of their own attractiveness. As a result, the desire to increase their perceived attractiveness puts pressure on people to reduce their weight. According to Cash, et al. (1986), self negative appraisals of body size may damage women's physical and emotional health and create psychological problems such as bulimia and/or anorexia nervosa.

Table 37

Respondents' BMI, Self-designated Size, and Self-report of Others' Perceptions of Subject's Body size

Sample	Parameter	Underweight (BMI)	Normal (BMI)	Overweight (BMI)
Americans	Real BMI	20.6%	75%	3.7%
	Self Ratings	3.7%	86.9%	9.4%
	Others' Perception	9.3%	86.0%	4.7%
Russians	Real BMI	37.3%	56.9%	5.9%
	Self Ratings	9.8%	70.6%	19.6%
	Others' Perception	14.7%	70.6%	14.7%

Respondents' ratings of their own attractiveness were generally similar to how they thought others perceived their level of attractiveness. More Russian students thought that they were attractive or very attractive than their American peers. Fiftytwo percent of Russian respondents saw themselves as attractive, and 46% thought that others would perceive them as attractive. Close to the same proportion of American respondents (54%) choose neutral for their body attractiveness, calling themselves neither attractive nor unattractive. When American students rated how others perceived them ,48% reported neutral. Americans' second most chosen answer for self and others was attractive.

According to Fallon (1990), each cultural group has different beauty standards and, naturally, the perception of attractiveness varies from culture to culture. However, Hogg et al. (1995) suggested that the perception of beauty is not based on cultural differences. Findings of this study support the idea that attractiveness is not standardized in all cultures. Russian respondents in this study always reported lower scores of body attractiveness for the 27 scans than American respondents. There was a significant difference between Americans' and Russians' perceptions of attractiveness.

Furnham et al. (1997) cross-culturally investigated preferences for body shapes and reported differences between Portugal and Denmark. Findings showed that Danes preferred bodies that were more angular, whereas the Portuguese demonstrated a higher preference for the hourglass body shape. Results in this study suggest that American students perceived all body shapes (as shown in scans) as more attractive than the Russians did. However, the only significant difference between Americans and Russians was for the hourglass body shape. Overall results did not support Singh's (1993; 1994a, 1994b) contention that there is a relationship between body shape and attractiveness. However, body shape of those studies considered only one parameter, WHR. In this study, body shape was categorized considering more parameters than simply WHR. This categorization was defined by Connell et al. (2004), viewing frontal body image as hourglass, rectangle or pear shapes.

The results of this study showed a direct relationship between perceptions of attractiveness and body size for both Americans and Russians and support the findings of Tovee et al. (1998, 2001, 2002, 2003). As body size got larger, bodies were perceived less attractive. Thus, it can be concluded that body size is a stronger criterion for body

attractiveness than body shapes. In this study, only body size has a significant influence on perceptions of body attractiveness.

Many researchers (Crandall et al., 1990; Fallon et al., 1985; Furnham et al. 1996; Garner et al., 1980; Tovee, et al., 1999) reported that thin women are perceived as more attractive than overweight and/or obese women. This research shows that overweight body scans were perceived as the most unattractive by both samples. Body scans with underweight BMI were perceived as being the most attractive. The difference between all body sizes, as well as the differences between the Americans' and Russians' perceptions among these sizes was significant. Russians consistently rated bodies with lower BMI as more attractive than Americans. The largest difference between the two groups was found for the underweight body size. These results support previously conducted studies that thinner bodies were perceived as more attractive (Tovee et al., 1998, 2001, 2002, 2003).

Both groups in the sample were mostly correct in perceiving the overweight body images (94% Americans, 97% Russians). Most of the underweight body scans were perceived as normal by both samples. Overall, the Russians were slightly more accurate in their perceptions for overweight (97%) and underweight (32%) scans than Americans (94% and 29% respectively). However, Americans (73%) were more accurate in their perceptions of normal body size than Russians (60%). Russian subjects tended to place more of the normal size scans in the underweight category.

There are a number of studies that have judged women's bodies from many dimensions and angles (Forestell et al., 2004; Henss 1995, 2000; Singh, 1993; 1994a,

1994b; Tassinary et al., 1998; Tovee et al., 1998, 2001, 2002, 2003). All of these studies focused on WHR as a measure of shape for the human body. Results of this analysis showed a significant influence of body shape in perceptions of body size for the whole sample (e.g. Americans and Russians together). However, no significant difference between American and Russian perceptions of body size for any body shape was found. This suggests that body shape is a strong parameter in perceptions of body size. Analysis of the relationship of body shapes to perceptions of body size within each nationality group showed that only the hourglass body shape did not significantly influence Russian students' perceptions of body size. Americans students' perceptions of body size were significantly influenced by each body shape.

In this study, no relationship was found between the respondents' personal BMI category and their perception of body size. All respondents reported their weight and height measurements in the questionnaire. Alexander (2003) reported that female respondents (Americans in her study) were accurate in reporting their body measurements. However, there is no research reporting Russian females' reliability in self-reporting body measurements. Using the information reported by respondents, BMI categorization was used to group them as underweight, normal, or overweight. Results of the analyses showed no significant relationship between respondents' personal BMI scores and their perceptions of body size. There was no significant difference between Americans and Russians.

A comparison between the respondents' personal BMI scores and their perceptions of body attractiveness showed a different picture. In this case, results showed a significant relationship between respondents' personal BMI scores and perceptions of

attractiveness comparing American and Russian respondents. Analyses of the Russian sample did not reveal any significant relationship between their personal BMI scores and perceptions of attractiveness. These results support the findings of Forestell et al. (2004), who found no significant effect of female participants' personal BMI on their attractiveness ratings. Their effect was checked in three BMI levels: light ($BMI < 20$), moderate ($20 < BMI < 24$), and heavy ($BMI > 24$). Analysis of American data in this study was different. Americans' personal BMI scores were significantly related to their perceptions of attractiveness. Analyses of the relationship of two factors (personal BMI and perception of attractiveness) within each BMI category (underweight, normal, and overweight) also revealed no significant relationship for Russians and a significant relationship for Americans. In other words, for Americans, the perception of attractiveness is significantly related to every category of personal BMI.

The findings of this study support the idea that perception of attractiveness is a multidimensional phenomenon and differs from culture to culture. On the whole, this study shows evidence for the significant effect of BMI on the perception of attractiveness as well as a significant effect of body shape on the perception of body size. Cross-cultural differences arose with respect to relationships of body size of the scans with personal BMI categories of respondents. Difference in regard to BMI categories of scans is believed to be caused by cultural influences (Furnham et al., 2002). No cross-cultural difference occurred related to body shapes of 27 scans.

Limitations

Limitations of this study included the manner in which subjects were sampled, the limited number of respondents in the sample, the lack of a means to include both rural

and urban regions in both cultures, and the set of stimuli. A wider number of respondents would allow analyzing respondents' perceptions based also on their ethnicity and BMI categories. Since a convenience sample was used in this study, findings cannot be generalized for a wider population.

Another limitation was the fact that American students attending college in a small town in the Southeastern region of the U.S. were compared with students from the largest city of Russia. Both samples were composed only of students from a narrow range of majors. Because the American university is involved in research on body scanning, American students might have had an opportunity to see real body scans during their classes. Russian respondents, however, had probably never seen body scan images. This detail could have introduced bias as the students viewed the stimuli and recorded their scores. It could explain the fact that Russian respondents always had lower perceptions of attractiveness for both body shape and size.

Caucasian respondents were dominant in both samples. The study was not balanced for Hispanics, African-Americans, and Asians in the American group. The Russian group was mainly composed of Russians. Other nationalities were under-represented.

Having access to a limited number of body scans narrowed availability to select body images holding constant different body parts such as posture; hip shape and position; bust size, shape and position; and shoulder shape. In addition, profile views of body scans, which were not used in the stimuli, might have given an additional picture of body shape.

Implications

Understanding the perception of body attractiveness in our modern life will be valuable for specialists in providing support for women's physical and emotional health. Existing norms of thinness as criteria for women's physical attractiveness are associated in both American and Russian societies with beauty, success, social attractiveness, health, youth, and elegance. However, the obesity rate is increasing in both cultures, with increased health risks, including to women's emotional and physical health. Additional cross-cultural study in this field would help to understand this paradoxical phenomenon within different socio-cultural environments that broadcast norms of extreme thinness through fashion, beauty ads, and mass media. Apparel designers of both countries could use the findings of this research to design their collections to emphasize the most preferred body shapes.

Recommendations for Future Research

The findings of this study may add to the cross-cultural literature on body attractiveness. Existing literature in the field of body attractiveness has been restricted due to the types of stimuli sets used for investigation. Most of the studies have used two-dimensional images, mostly line drawings. Although images of real people were used in this study, they were presented on a screen, which restricted the impression of a three-dimensional view. For further research in this field, use of visual equipment (e.g. computer, projector) with a software program to rotate images and provide a three-dimensional presentation is recommended.

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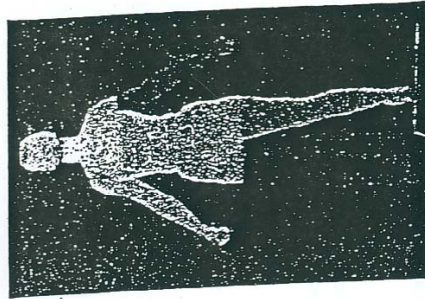
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APPENDICES

APPENDIX A

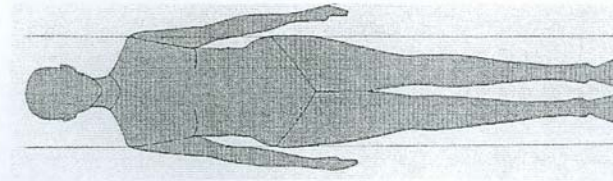
BODY SHAPE ASSESSMENT SCALE

BODY SHAPE ASSESSMENT SCALE (BSAS)



© Connell, Ulrich, Brannon, and Presley (2002)

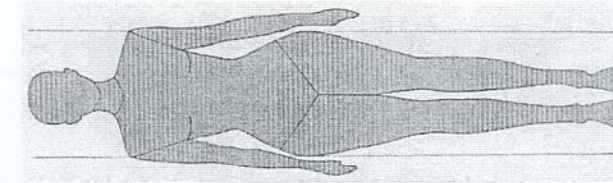
Body Shape: Relationship among shoulders, waist and hips.



R

Rectangular:

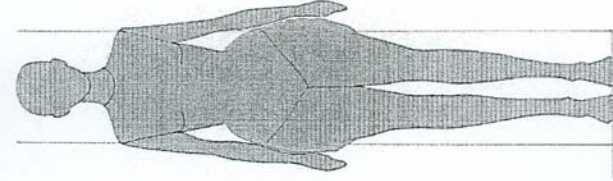
Shoulder and hip width are balanced (equal or nearly equal) with little to no waist definition.



H

Hourglass:

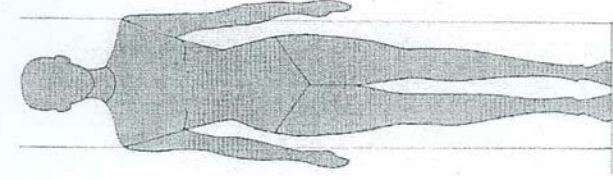
Shoulder and hip width are balanced (equal or nearly equal) with clearly defined to very small waist in relation to shoulder and hip width.



P

Pear:

Hip and/or thigh width is visually greater than shoulder width.



I

Inverted Triangle:

Shoulder width is visually greater than fullest width at hip or thighs.

APPENDIX B

INSTRUMENT FOR RECORDING RESPONSES OF AMERICAN RESPONDENTS

SECTION 1

Please circle the number from 1-5 that best represents your opinion of the attractiveness of each of following images

1. Rate the attractiveness of the image 1

1 2 3 4 5

**Very
Attractive**

Very Unattractive

2. Rate the attractiveness of the image 2

1 2 3 4 5

**Very
Attractive**

Very Unattractive

3. Rate the attractiveness of the image 3

1 2 3 4 5

**Very
Attractive**

Very Unattractive

4. Rate the attractiveness of the image 4

1 2 3 4 5

**Very
Attractive**

Very Unattractive

5. Rate the attractiveness of the image 5

1 2 3 4 5

**Very
Attractive**

Very Unattractive

6. Rate the attractiveness of the image 6

1 2 3 4 5

**Very
Attractive**

Very Unattractive

7. Rate the attractiveness of the image 7

1 2 3 4 5

**Very
Attractive**

Very Unattractive

SECTION 1..cont.

8. Rate the attractiveness of the image 8

1 2 3 4 5

**Very
Attractive**

Very Unattractive

9. Rate the attractiveness of the image 9

1 2 3 4 5

**Very
Attractive**

Very Unattractive

10. Rate the attractiveness of the image 10

1 2 3 4 5

**Very
Attractive**

Very Unattractive

11. Rate the attractiveness of the image 11

1 2 3 4 5

**Very
Attractive**

Very Unattractive

12. Rate the attractiveness of the image 12

1 2 3 4 5

**Very
Attractive**

Very Unattractive

13. Rate the attractiveness of the image 13

1 2 3 4 5

**Very
Attractive**

Very Unattractive

14. Rate the attractiveness of the image 14

1 2 3 4 5

**Very
Attractive**

Very Unattractive

SECTION 1...cont.

15. Rate the attractiveness of the image 15

1 2 3 4 5

**Very
Attractive**

Very Unattractive

16. Rate the attractiveness of the image 16

1 2 3 4 5

**Very
Attractive**

Very Unattractive

17. Rate the attractiveness of the image 17

1 2 3 4 5

**Very
Attractive**

Very Unattractive

18. Rate the attractiveness of the image 18

1 2 3 4 5

**Very
Attractive**

Very Unattractive

19. Rate the attractiveness of the image 19

1 2 3 4 5

**Very
Attractive**

Very Unattractive

20. Rate the attractiveness of the image 20

1 2 3 4 5

**Very
Attractive**

Very Unattractive

21. Rate the attractiveness of the image 21

1 2 3 4 5

**Very
Attractive**

Very Unattractive

SECTION 1...cont.

22. Rate the attractiveness of the image 22

1 **2** **3** **4** **5**

**Very
Attractive**

Very Unattractive

23. Rate the attractiveness of the image 23

1 **2** **3** **4** **5**

**Very
Attractive**

Very Unattractive

24. Rate the attractiveness of the image 24

1 **2** **3** **4** **5**

**Very
Attractive**

Very Unattractive

25. Rate the attractiveness of the image 25

1 **2** **3** **4** **5**

**Very
Attractive**

Very Unattractive

26. Rate the attractiveness of the image 26

1 **2** **3** **4** **5**

**Very
Attractive**

Very Unattractive

27. Rate the attractiveness of the image 27

1 **2** **3** **4** **5**

**Very
Attractive**

Very Unattractive

SECTION 2

Please circle the letter from A, B, C that best represents your view of the person's size shown each of the following images

1. Looking at Image number # 1, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

2. Looking at Image number # 2, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

3. Looking at Image number # 3, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

4. Looking at Image number # 4, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

5. Looking at Image number # 5, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

6. Looking at Image number # 6, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

SECTION 2...cont.

7. Looking at Image number # 7, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

8. Looking at Image number # 8, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

9. Looking at Image number # 9, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

10. Looking at the Image number #10, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

11. Looking at the Image number #11, I think she:

- A. Underweight
- B. Normal
- C. Overweight

12. Looking at the Image number #12, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

SECTION 2...cont.

13. Looking at the Image number #13, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

14. Looking at the Image number #14, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

15. Looking at the Image number #15, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

16. Looking at the Image number #16, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

17. Looking at the Image number #17, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

18. Looking at the Image number #18, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

SECTION 2...cont.

19. Looking at the Image number #19, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

20. Looking at the Image number #20, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

21. Looking at the Image number #21, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

22. Looking at the Image number #22, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

23. Looking at the Image number #23, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

24. Looking at the Image number #24, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

25. Looking at the Image number #25, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

26. Looking at the Image number #26, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

27. Looking at the Image number #27, I think she is:

- A. Underweight
- B. Normal
- C. Overweight

SECTION 3

Please answer the following questions about yourself. In order to get a complete and accurate picture it is important that you answer as honestly as possible. Your answer will be kept confidential so no one will know how you responded. Thank you for your cooperation and participation.

1. How old are you? **(Circle ONE)**

18 19 20 21 22 23 24 over 25

2. Check the category that identifies your race. **(Check ONE box)**

African-American Hispanic Asian

Caucasian

Other (Specify): _____

(For the Russian sample the question 2 will be adjusted according to demographic characteristics of Moscow)

3. What is your major? _____

4. How often you exercise? **(Check ONE box)**

- No times
- 2-3 times a week
- 4-5 times a week
- 6-7 times a week

5. How often do you read fashion magazines?

- No times
- Every day
- 2-3 times a week
- Once in a week
- Once in a month

6. List your approximate measurements in the appropriate spaces.

Weight (in pounds) _____ Heights (in feet and inches) _____
(for the Russian sample this question will be in kilograms for weight and metric system for height)

SECTION 4

Please circle the number from 1-5 that best represents your opinion about your personal attractiveness.

1. Please rate your overall body image:

1 2 3 4 5

**Very
Attractive**

Very Unattractive

2. Please describe how you feel others would rate your body image:

1 2 3 4 5

**Very
Attractive**

Very Unattractive

Please circle the letter from A to C that best represents your opinion about yourself.

3. I think I am:

- A. Underweight
- B. Normal
- C. Overweight

4. How you think others would describe your body size:

- A. Underweight
- B. Normal
- C. Overweight

APPENDIX C

INSTRUMENT FOR RECORDING RESPONSES OF RUSSIAN RESPONDENTS

РАЗДЕЛ 1

Пожалуйста обведите цифру от 1 до 5, которая наилучшим образом отображает Ваше мнение относительно привлекательности следующих образов.

1. Оцените привлекательность рисунка номер 1

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

2. Оцените привлекательность рисунка номер 2

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

3. Оцените привлекательность рисунка номер 3

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

4. Оцените привлекательность рисунка номер 4

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

5. Оцените привлекательность рисунка номер 5

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

6. Оцените привлекательность рисунка номер 6

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

РАЗДЕЛ 1.....продолжение

7. Оцените привлекательность рисунка номер 7

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

8. Оцените привлекательность рисунка номер 8

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

9. Оцените привлекательность рисунка номер 9

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

10. Оцените привлекательность рисунка номер 10

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

11. Оцените привлекательность рисунка номер 11

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

12. Оцените привлекательность рисунка номер 12

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

РАЗДЕЛ 1.....продолжение

13. Оцените привлекательность рисунка номер 13

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

14. Оцените привлекательность рисунка номер 14

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

15. Оцените привлекательность рисунка номер 15

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

16. Оцените привлекательность рисунка номер 16

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

17. Оцените привлекательность рисунка номер 17

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

18. Rate the attractiveness of the image 18

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

РАЗДЕЛ 1.....ПРОДОЛЖЕНИЕ

19. Оцените привлекательность рисунка номер 19

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

20. Оцените привлекательность рисунка номер 20

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

21. Оцените привлекательность рисунка номер 21

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

22. Оцените привлекательность рисунка номер 22

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

23. Оцените привлекательность рисунка номер 23

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

24. Оцените привлекательность рисунка номер 24

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

РАЗДЕЛ 1.....ПРОДОЛЖЕНИЕ

25. Оцените привлекательность рисунка номер 25

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

26. Оцените привлекательность рисунка номер 26

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

27. Оцените привлекательность рисунка номер 27

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

РАЗДЕЛ 2

Пожалуйста обведите букву А, В или С, которая наиболее точно отображает Ваше мнение о размере (комплексии) людей, изображенных на следующих рисунках.

1. На мой взгляд, женщина в Рисунке #1

D. Худощавая

E. Нормальная

F. Полноватая

2. На мой взгляд, женщина в Рисунке # 2

A. Худощавая

B. Нормальная

C. Полноватая

3. На мой взгляд, женщина в Рисунке # 3

A. Худощавая

B. Нормальная

C. Полноватая

4. На мой взгляд, женщина в Рисунке # 4

A. Худощавая

B. Нормальная

C. Полноватая

5. На мой взгляд, женщина в Рисунке # 5

A. Худощавая

B. Нормальная

C. Полноватая

РАЗДЕЛ 2.....ПРОДОЛЖЕНИЕ

6. На мой взгляд, женщина в Рисунке # 6

- A. Худощавая
- B. Нормальная
- C. Полноватая

7. На мой взгляд, женщина в Рисунке # 7

- A. Худощавая
- B. Нормальная
- C. Полноватая

8. На мой взгляд, женщина в Рисунке # 8

- A. Худощавая
- B. Нормальная
- C. Полноватая

9. На мой взгляд, женщина в Рисунке # 9

- A. Худощавая
- B. Нормальная
- C. Полноватая

10. На мой взгляд, женщина в Рисунке #10

- A. Худощавая
- B. Нормальная
- C. Полноватая

11. На мой взгляд, женщина в Рисунке #11

- A. Худощавая
- B. Нормальная
- C. Полноватая

РАЗДЕЛ 2.....ПРОДОЛЖЕНИЕ

12. На мой взгляд, женщина в Рисунке #12

- A. Худощавая
- B. Нормальная
- C. Полноватая

13. На мой взгляд, женщина в Рисунке #13

- A. Худощавая
- B. Нормальная
- C. Полноватая

14. На мой взгляд, женщина в Рисунке #14

- A. Худощавая
- B. Нормальная
- C. Полноватая

15. На мой взгляд, женщина в Рисунке #15

- A. Худощавая
- B. Нормальная
- C. Полноватая

16. На мой взгляд, женщина в Рисунке #16

- A. Худощавая
- B. Нормальная
- C. Полноватая

17. На мой взгляд, женщина в Рисунке #17

- A. Худощавая
- B. Нормальная
- C. Полноватая

РАЗДЕЛ 2.....ПРОДОЛЖЕНИЕ

18. На мой взгляд, женщина в Рисунке #18

- A. Худощавая
- B. Нормальная
- C. Полноватая

19. На мой взгляд, женщина в Рисунке #19

- A. Худощавая
- B. Нормальная
- C. Полноватая

20. На мой взгляд, женщина в Рисунке #20

- A. Худощавая
- B. Нормальная
- C. Полноватая

21. На мой взгляд, женщина в Рисунке #21

- A. Худощавая
- B. Нормальная
- C. Полноватая

22. На мой взгляд, женщина в Рисунке #22:

- A. Худощавая
- B. Нормальная
- C. Полноватая

23. На мой взгляд, женщина в Рисунке #23

- A. Худощавая
- B. Нормальная
- C. Полноватая

РАЗДЕЛ 2.....ПРОДОЛЖЕНИЕ

24. На мой взгляд, женщина в Рисунке #24:

- A. Худощавая
- B. Нормальная
- C. Полноватая

25. На мой взгляд, женщина в Рисунке #25

- A. Худощавая
- B. Нормальная
- C. Полноватая

26. На мой взгляд, женщина в Рисунке #26

- A. Худощавая
- B. Нормальная
- C. Полноватая

27. На мой взгляд, женщина в Рисунке #27

- A. Худощавая
- B. Нормальная
- C. Полноватая

РАЗДЕЛ 3

Пожалуйста ответьте на следующие вопросы о себе. Для наиболее точного и полного анализа нам очень важно получить правдивые ответы. Ваши ответы будут сохранены в строгой конфиденциальности. Спасибо за Ваше сотрудничество и участие.

1. Сколько Вам лет? (Обведите цифру)

18 19 20 21 22 23 24 за 25

a. Какой Вы национальности? (Отметьте один из квадратов)

русская украинка белорусска

татарка

Другая (укажите): _____

3. Ваша специальность (будущая) _____

4. Как часто Вы занимаетесь спортом? (Отметьте один из квадратов)

- Никогда
- 2-3 раза в неделю
- 4-5 раз в неделю
- 6-7 раз в неделю

5. Как часто Вы читаете журналы мод?

- Никогда
- Каждый День
- 2-3 раза в неделю
- Раз в неделю
- Раз в месяц

a. Пожалуйста укажите свой

Вес (в килограммах) _____

и Рост (в метрах) _____

РАЗДЕЛ 4

Пожалуйста обведите цифру от 1 до 5, которая наилучшим образом отображает Ваше мнение о личной привлекательности.

2. Оцените общий образ своего тела:

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

5. Как, на Ваш взгляд, другие оценивают Ваше тело.:

1 2 3 4 5

**Очень
привлекательно**

**Очень
непривлекательно**

Пожалуйста обведите букву от А до С, которая наиболее точно отображает Ваше мнение о себе.

3. На мой взгляд, я

- A. Худощавая
- B. Нормальная
- C. Полноватая

4. Как на Ваш взгляд другие описали бы Вашу комплекцию

- A. Худощавая
- B. Нормальная
- C. Полноватая

APPENDIX D
INFORMED CONSENT LETTER

**INFORMATION SHEET
FOR
THE ROLE OF BODY MASS INDEX AND BODY SHAPE IN PERCEPTION OF BODY
ATTRACTIVENESS: CROSS-CULTURAL STUDY**

You are invited to participate in a research study to understand the role of body weight and body shape in perceptions of attractiveness. This study is being conducted by Marine Aghekyan, Graduate Research Assistant, under the supervision of Dr. Lenda Connell and Dr. Pamela Ulrich. We hope to learn attractiveness' perceptions in American and Russian cultures. You were selected as a possible participant because you are 19th years old and/or over and represent the female student population in your country.

If you decide to participate, we will invite you for a single survey session, where you will be given questionnaire and instruction and time for Q/A session. It will be slide demonstration based on which you will be asked to answer to the relevant question in the questionnaire. It will take from 15 to 20 minutes. After the completing the study you will be requested to place the questionnaire in the drop box provided.

Scientists and experts in the areas of physiology, sociology, and medicine think about new strategies to help women in their physical and emotional health. Exploration in understanding the perception of attractiveness in a global spectrum will be beneficial for experts in various areas. Therefore it is very important to understand more about body attractiveness and body size perceptions.

Any information obtained in connection with this study will remain anonymous. Information collected through your participation may be published as results in professional journals, as well as present the results at conferences. Participants must also be informed that they may withdraw from participation at any time, without penalty, however, after they have provided anonymous information they will be unable to withdraw their data after participation since there will be no way to identify individual information.

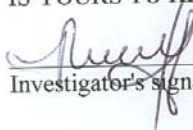
Your decision whether or not to participate will not jeopardize your future relations with Auburn University or Department of Consumer Affairs.

If you have any questions we invite you to ask them now. If you have questions later Marine Aghekyan at (334) 844 1341, aghekma@auburn.edu investigator and Dr. Connell at (334) 844 3789 faculty advisor will be happy to answer them.

For more information regarding your rights as a research participant you may contact the Office of Human Subjects Research by phone or e-mail. The people to contact there are Executive Director

E.N. "Chip" Burson (334) 844-5966 (bursoen@auburn.edu) or IRB Chair Dr. Peter Grandjean at (334) 844-1462 (grandpw@auburn.edu).

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

 12.16.04
Investigator's signature Date

Co-investigator's signature Date
(if appropriate)

Информация по
Меж-Культурному Исследованию на тему:
Роль Индекса Массы Тела (ИМТ) и Форм Тела в Восприятии
Привлекательности Тела

Мы приглашаем Вас к участию в исследовании влияния веса и форм тела на восприятие привлекательности. Исследование проводится аспиранткой Марине Агемян, под руководством Профессоров Ленды Коннел и Памелы Улрич. Мы надеемся изучить восприятия привлекательности в Американской и Русской культурах. Вы были выбраны как возможная участница данного исследования, т.к. Вам уже исполнилось 19 лет и Вы являетесь представительницей студенческого населения Вашей страны.

Если Вы решите участвовать в исследовании, мы пригласим Вас на одинарную встречу, в которой будет отведено время для инструктажа, заполнения опросника и вопросов/ответов. Вам будет представлена демонстрация слайдов, относительно которых Вас попросят ответить на соответствующие вопросы в опроснике. Это займет около 15-20 минут. После завершения исследования Вас попросят опустить опросник в специальный ящик.

Ученые и эксперты в области психологии, социологии и медицины работают над разработкой новых стратегий, чтобы помочь женщинам в поддержании и сохранении физического и эмоционального здоровья. Изучение и понимание восприятия привлекательности в глобальных масштабах поможет экспертам в различных областях. Таким образом, необходимо более глубокое понимание восприятия размеров тела и привлекательности тела.

Любая информация, полученная в связи с данным исследованием остается анонимной. Информация, полученная в результате Вашего участия может быть опубликована в виде обработанных результатов в специализированных журналах, а также представлена на конференциях. Участники должны быть извещены, что они могут прекратить участие в исследовании в любое время без отрицательных последствий. Однако, после завершения опросника и его сдачи, возврат данных будет невозможным за отсутствием способа идентификации индивидуальной информации.

Ваше решение об участии в исследовании никоим образом не влияет на Ваши возможные будущие взаимоотношения ни с Обурнским Университетом, ни с Факультетом Изучения Потребителей, ни с Факультетом и Университетом в котором Вы в настоящий момент обучаетесь.

College of Human Sciences Department of Consumer Affairs
308 Spidle Hall, Auburn University, Alabama 36849 T 334.844.4084 F 334.844.1340

HUMAN SUBJECTS
OFFICE OF RESEARCH
PROJECT # 04-193 EP 0412
APPROVED 12-16-04 TO 12-15-05

Если у Вас возникли какие-либо вопросы, мы можем сейчас на них ответить. Если у Вас появятся вопросы в дальнейшем, Марине Агемян по телефону 1(334) 844 1341 и Профессор Коннел по телефону 1(334)844 3789 будут рады ответить на них.

Для получения дополнительной информации о Ваших правах, как участницы исследования, Вы можете связаться с Office of Human Subjects Research по телефону или электронной почтой. На Ваши вопросы может ответить Исполнительный Директор Е.Н. /!№:"Чип" Бурсон (334) 844 5966 (bursoen@auburn.edu) или Председатель IRB Профессор Питер Гранджан (334) 844-1462 (grandpw@auburn.edu) .

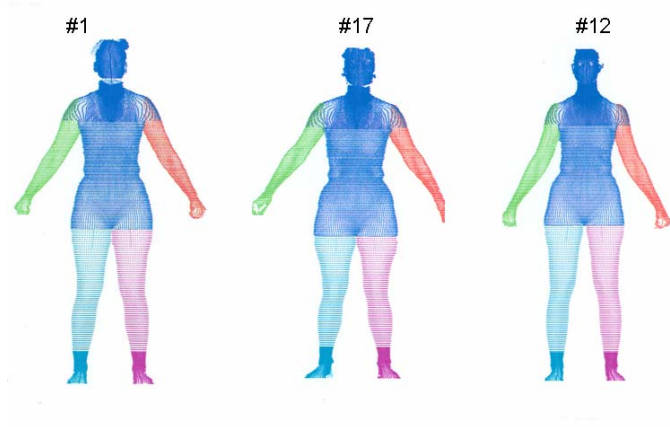
ПРИНИМАЯ ВО ВНИМАНИЕ ВЫШЕУКАЗАННУЮ ИНФОРМАЦИЮ, ВЫ ДОЛЖНЫ РЕШИТЬ ЖЕЛАЕТЕЛИ ВЫ ПРИНЯТЬ УЧАСТИЕ В ДАННОМ ИССЛЕДОВАНИИ. В СЛУЧАЕ ПОЛОЖИТЕЛЬНОГО РЕШЕНИЯ, ПРЕДОСТАВЛЕННАЯ ВАМИ ИНФОРМАЦИЯ ПОСЛУЖИТ ВАШИМ СОГЛАСИЕМ НА УЧАСТИЕ. ВЫ МОЖЕТЕ СОХРАНИТЬ У СЕБЯ ДАННОЕ ПИСЬМО,


Подпись исследователя

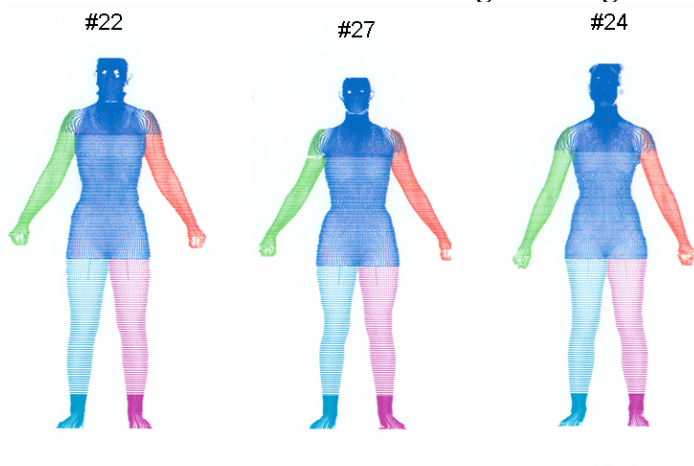
12.16.042.
Дата

APENDIX E
WOMEN BODY SCAN IMAGES SLIDE EVALUATION

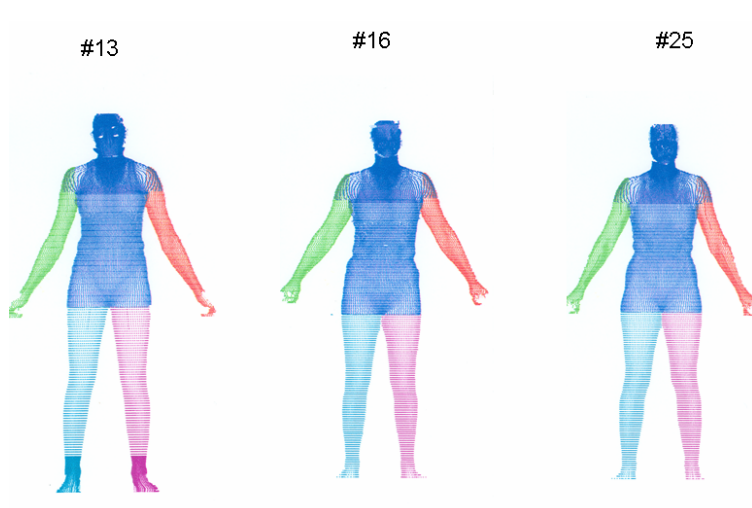
Normal Weight/Pear Shape



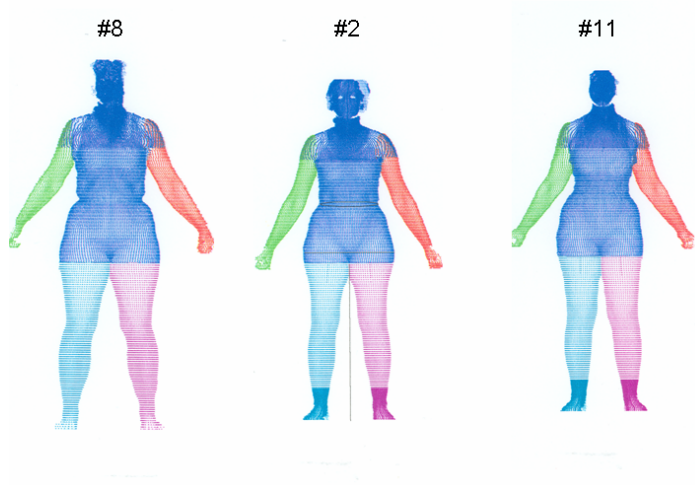
Normal Weight/Hourglass



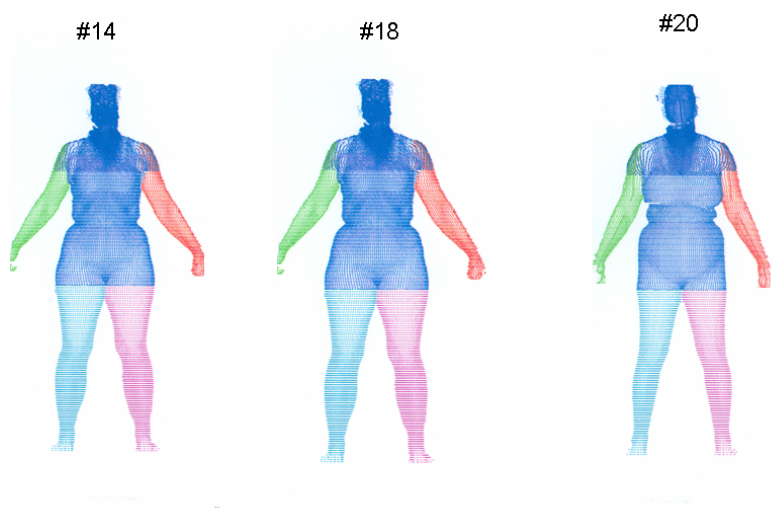
Normal weight/Rectangle



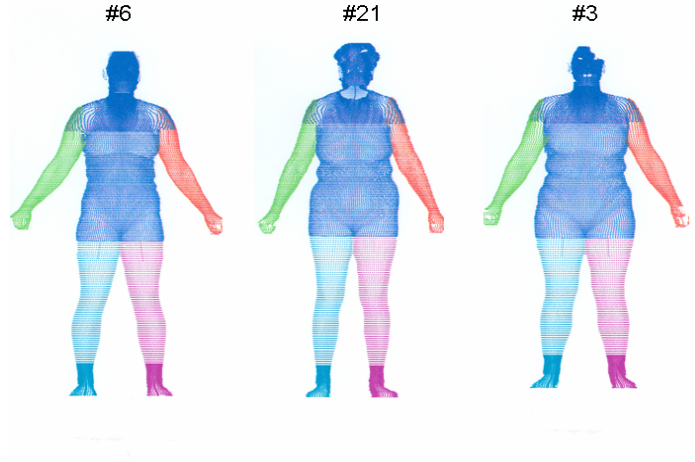
Overweight/Pear Shape



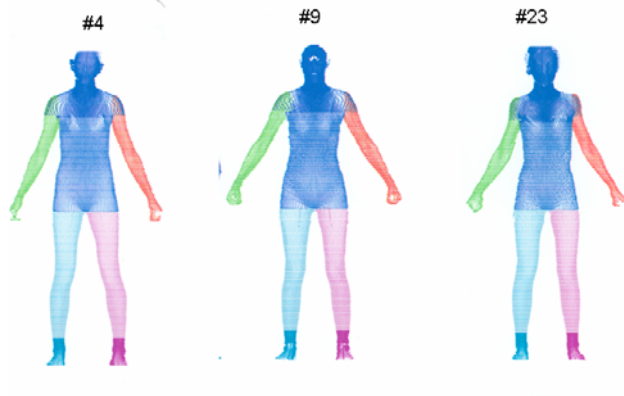
Overweight/Hourglass



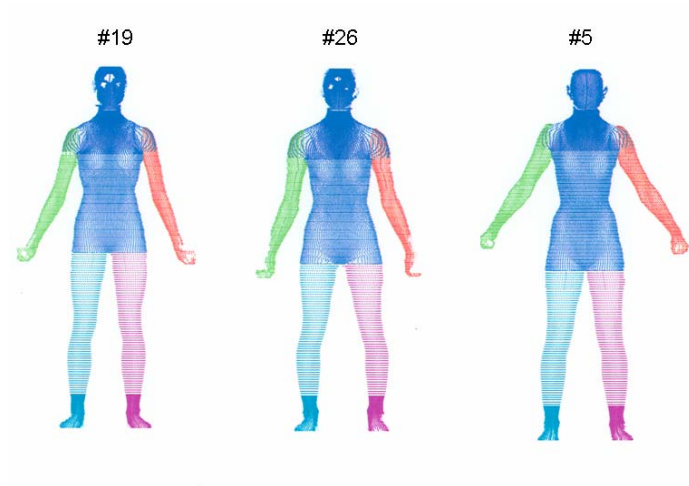
Overweight/Rectangle



Underweight/Pear Shape



Underweight/Hourglass



Underweight/Rectangle

