*C*hapter 5

DATA ANALYSIS AND DISCUSSION OF THE FINDINGS BASED ON PHASE ONE DATA (BODY DIMENSIONS AND PHOTOGRAPHS)

5.1   INTRODUCTION

This study employed manual anthropometric techniques of obtaining body dimensions as the cheapest method available at the time, and because the aim was to identify only a distinctive body shape from the data collected from a small population. This chapter presents the results, discussions and interpretations according to the primary objectives 1, 2 and 3 of this study.

The body measurements in this study were taken from 123 career women aged between 25 and 55 years. The specific body measurements that were taken for this study have been explained in chapter **4 paragraph 4.5.1.1** and shown in **Figure 4.3,** while rules that were observed during the measuring process is also provided as an attached appendix at the end of this thesis (**Appendix 3B).**

5.2   IDENTIFICATION AND DESCRIPTION OF DISTINCTIVE FEMALE BODY SHAPE(S) OF CAREER WOMEN IN KENYA FROM BODY DIMENSIONS (PRIMARY OBJECTIVE 1 (SUB-OBJECTIVE 1))

Body dimensions have been viewed as the key players in the development of effective sizing systems, and must reflect the height, sizes and body shape proportions of a target population for better-fitting apparel (Beazley, 1998; Gupta & Gangadhar, 2004). Presented in **Table 5.1** are the means, range values (maximum and minimum) and standard deviations calculated for the purposes of identifying height and other body characteristics **(Tables 5.1 and 5.2)** that may affect the fit of apparel. It should be noted that the classifications made in this study were done within the context of the anthropometric data of this study.

5.2.1   Identification of height, bust extension, buttock extension, thigh bulge and the arc dimensions categories

The distributions of measurements for variables used in this study which includes; height, bust extension, buttock extension, bust extension, thigh bulge and arc measures, were

summarized by use of the calculated central tendencies (mean values), dispersion (range values) and the degrees of dispersions (standard deviation) (**Tables 5.1 and 5.2**). The variables were placed into different categories as reflected by the degree of deviation (SD) from the mean value. The standard deviation reflected the degree to which the values in a distribution deviated from the arithmetic mean. Standard deviation is usually presented in tandem with the mean **(Mean ± SD)**, because it is difficult to determine it's meaning in the absence of the mean (Bryman & Cramer, 1997:80-85).

TABLE 5.1: PERCENTAGE DISTRIBUTIONS OF HEIGHT, BUST EXTENSION, BUTTOCK EXTENSION AND THIGH BULGE CATEGORIES (n = 123)

HEIGHT				
Univariate analysis of height dimensions	Mean	SD	Maximum	Minimum
	161.6 cm	5.6 cm	176.0 cm	148.0 cm
Height Categories	Mean ± SD		Count (%)	
Short	148.8 cm to < 156.0		12 (10%)	
Medium	≥ 156.0 cm to ≤ 167.6 cm		93 (75%)	
Tall	>167.6 cm to 176.0 cm (Max*)		18 (15%)	
BUST EXTENSION				
Univariate analysis of bust extension	Mean	SD	Maximum	Minimum
	16.0 cm	3.0 cm	23.0 cm	10.0 cm
Bust extension Categories	Mean ± SD		Count (%)	
Small/flat	10.0cm (Min*) to < 13 cm		1 (0.8%)	
Medium	≥ 13.0 cm to ≤ 19.0 cm)		24 (19.6%)	
Large	> 19.0 cm to ≤ 23.0cm (Max*)		98 (79.6%)	
BUTTOCK EXTENSION				
Univariate analysis of buttock extension	Mean	SD	Maximum	Minimum
	16.0 cm	3.0 cm	23.0 cm	9.0 cm
Buttock extension categories	Mean ± SD		Count (%)	
Small/flat	9.0 cm (Min*) to < 13 cm		3 (2%)	
Medium	≥ 13.0 cm to ≤ 19.0 cm		36 (29%)	
Large	> 19.0 cm to ≤ 23.0cm (Max*)		84 (69%)	

* Min = Minimum range value; Max = Maximum range value

Height: It has been reported as one of the critical dimensions when designing and distributing apparel items to the correct marketplaces (Winks, 1997; Beazley, 1998; Gupta & Gangadhar, 2004; Chun, 2007). The population in this study was classified into the three different height groups, while body characteristics such as the bust, the buttocks, the thigh bulge, shoulders and the body balance were each also classified into three categories on the basis of how the range values deviated from the standard deviation (**Table 5.1**).

The different height categories were obtained by calculating the degree to which the values in a distribution deviated from the arithmetic mean. Short category was arrived at by sorting out all the values that fell below (**<**) the (Mean ± SD); the medium category was obtained by identifying all the values that were equal (=) to the (Mean ± SD) and the tall category was achieved by sorting out all the values that fell above (>) the (Mean ± SD) (Table 5.1) (Bryman & Cramer, 1997:80-85; Gupta & Gangadhar, 2004). This classification technique was applied in Beazley's (1998) and Gupta and Gangadhar's (2004) studies. Results about Height categories (**Table 5.1**) show that the majority (75%) of the participants were in the medium height category. It is important that the apparel industry take note of this percentage when deciding on relative quantities in the different size/height categories in the design and manufacture of ready-made apparel.

Bust and buttocks extensions: Circumferential dimensions such as the bust and the hips are one-dimensional in character, and therefore it is difficult to assess the extent of the protrusion of these features (bust/breasts and buttocks/derriere) from the measurements. Therefore, bust and buttock depth dimensions were deemed necessary in this study to determine the extension of the breasts size as well as the buttocks/derriere, respectively. The prominence (degrees of extension) of the bust and the buttocks is known to affect the fit of apparel at the bust and hip regions (Rasband & Liechty, 2006:194, 324).
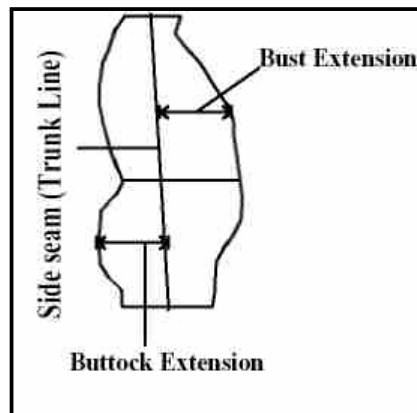
FIGURE 5.1: BUST AND BUTTOCKS EXTENSIONS

The trunk line/side seam line (**Figure 5.1)** must be identified before commencing the measurement exercise (also refer to **Chapter 4, paragraph 4.5.1.1** and **Figure 4.3**). The bust and the buttock extension measurements were taken with a segmometer instrument (**Figure 4.4**) from the trunk line to the breast tips and the edge of the buttocks respectively. Sliding callipers can also be used to obtain the same measurement.

The different bust and buttock extension categories were obtained by calculating the degree to which the values in a distribution differ from the arithmetic mean. Small bust/buttock extension = **<** (Mean ± SD); Medium bust/buttock extension category **=** (Mean ± SD) and the large bust/buttock extension = **>** (Mean ± SD) (Table 5.1) (Bryman & Cramer). The results regarding buttock extension and thigh bulge categories in **Table 5.1** also demonstrate that the majority of the participants had a large bust (81%) and large buttocks (69%). The large buttocks have fit implications around the hip, thigh and crotch line, while the large bust could affect the fit of the garment around the bust region.

Thighs: Heavy or bulging thighs may be positioned and/or shaped differently, thus affecting the fit of the apparel item either vertically or horizontally. If the thighs are fuller or thinner than average, pants/skirts with a close fit will tend to either sag (form folds) as a result of very loose fit, or will form wrinkles as a result of a tight fit (Rasband & Liechty, 2006:340). To determine the thigh bulge dimension, the subjects were measured on two positions of the hip region: one was taken at the normal hip position (trochanterion region) and the second hip dimension was obtained at a position of approximately 10 cm below the normal hipline (**Figure 4.3**).

The thigh bulge **(Table 5.2)** was determined by subtracting the hip circumference dimension at the normal (trochantrion region) position from the measurement over (circumference) the broadest region of the hips (highest thigh position) at approximately 10 cm below the normal hip position. The different categories **(Table 5.2)** were obtained by calculating the degree to which the values in the distribution differed from the arithmetic mean. In this study, small thigh bulge = < (Mean ± SD); Medium thigh bulge = (Mean ± SD) and the large thigh bulge = > (Mean ± SD) (Table 5.2) (Bryman & Cramer).

Shoulders: Shoulders act as the apparel's "hanger", facilitating an aesthetic appearance as the apparel drapes gracefully over the body. The size of the shoulders in relation to other parts of the body, and their shape, will affect the fit of the apparel (Rasband, 1994:68-72). The shoulder slope dimension was obtained by subtracting the shoulder height (shoulder to ground) dimension from the nape to ground dimension.

The different shoulder categories were obtained by calculating the degree to which the values in the distribution differed from the arithmetic mean. In this study, slopped shoulders = **<** (Mean ± SD); normally shaped shoulders **=** (Mean ± SD) and the squared shoulders = **>** (Mean ± SD). Results about shoulder shape categories **(Table 5.2)** clearly show that the majority (67%) of the participants' shoulders were normally shaped, which indicates that they may possibly experience minimal shoulder fit problems

TABLE 5.2: PERCENTAGE DISTRIBUTIONS OF THIGH BULGE, SHOULDER CATEGORIES AND ARC AT KEY REGIONS (N = 123)

THIGH BULGE					
Univariate analysis of thigh bulge		Mean	SD	Maximum	Minimum
		2.5 cm	2.0cm	6.0 cm	0.0 cm
Thigh bulge categories		Mean ± SD		Count (%)	
Small thigh bulge		< 1.0 cm		1 (0.8%)	
Medium thigh bulge		≥1.0 cm to ≤ 5.0 cm		102 (83%)	
Large thigh bulge		> 5.0 cm to ≤ 6.0 cm (Max*)		20 (16.2%)	
SHOULDERS					
Univariate analysis of shoulder drop/shape		Mean	SD	Maximum	Minimum
		3.5 cm	1.5 cm	7.0 cm	0.0 cm
Shoulder shape categories		Mean ± SD		Count (%)	
Squared		< 3.5 cm		18 (14%)	
Normal		≥ 3.5 cm to ≤ 5.5 cm		81 (67%)	
Sloped		> 5.5 cm to 7.0 cm (Max*)		24 (19%)	
BALANCE/ARC					
Univariate analysis of arc dimensions		Mean	SD	Maximum	Minimum
Front bust arc subtract back arc		8.0 cm	3.5 cm	22.0 cm	2.0 cm
Front waist arc subtract back waist arc		2.0 cm	3.0 cm	17.0 cm	0.0 cm
Back hip arc subtract front hip arc		9.0 cm	4 cm	28. 0 cm	0.0 cm
Arc dimensions categories		Mean ± SD		Count (%)	
Bust line arcs	Small front bust	2.0 cm to < 4.5 cm		22 (17%)	
	Medium front bust	≥ 4.5 cm to ≤ 11.5 cm		81 (67%)	
	Large front bust	> 11.5 cm to ≤ 22.0 cm (Max*)		20 (16%)	
Waistline arcs	Small front waist	< 0 cm (Min*)		2 (1.6%)	
	Medium front waist	≥ 0 cm to ≤ 5 cm		112 (91.1%)	
	Large front waist	> 5 cm to ≤ 17 cm (Max*)		9 (7.3%)	
Hipline arcs	Small back	0 to < 5.0 cm		11 (9%)	
	Medium back	≥ 5 cm to ≤ 13.0 cm		103 (82%)	
	Large back	> 13.0 cm to ≤ 28.0 cm (Max*)		11 (9%)	

* Min = Minimum range value; Max = Maximum range value

Results regarding thigh bulge in **Table 5.2** indicate that the majority (85%) of the participants had moderately large thighs, which could result with fit problem around the hip, thigh and crotch line.

Balance: A correct posture assumes a balanced alignment of all the parts of the body (back and front) over each other, and could influence the physical attractiveness of apparel (Rasband, 1994:13). The trunk line/side seam, also known as the balancing line, must be identified before commencing the exercise (refer to **Chapter 4, paragraph 4.5.1.1** and **Figure 4.3**). Arc dimensions (measurements taken from the right-side trunk line to the left-

side trunk line, either at the front or the back) were taken at the key regions (bust, waist and hip), to establish whether the postures/body shapes were balanced at these regions. Ashdown, Choi, Milke and Raymond (2004) warn that body shapes with excessive lordosis (swayback) or excessive kyphosis (hump back) cannot achieve the balanced side profile view. Excessive fat deposits on any part of the body could also cause body imbalance. The front part, for example, could contain more fat deposits than the back region, causing the figure to assume a backward stance in an attempt to counteract the weight balance.

As for all the other body characteristics, the different arc categories were obtained by calculating the degree to which the values in the distribution deviated from the arithmetic mean. Small arc = **<** (Mean ± SD); medium arc **=** (Mean ± SD) and the large arc = **>** (Mean ± SD). Results about body's balance categories at key body regions **(Table 5.2):** indicate that the front bust (65%) and front waist (92.5%) arcs were moderately larger than the back arc at the bust line and waistline regions, with strong correlations (r = 0.86) of both the back and front arc dimensions at the bust line and the waistline back and front arc dimensions (r = 0.94). The back hip arc was moderately (82%) larger than the front hip arc, with also strong correlations (r = 0.82) between the back arc and front arc measurements at hip regions. The large upper torso's front bust and waist imply that apparel worn by a woman with such shape characteristics is likely to pull towards the front making the side seam skewed. At the hip region, the apparel is likely to pull towards the back, thereby making the side seam skewed towards the back. Statistically, the three back arc dimensions and the front arc dimension showed no significant (0.0001< 0.05) associations.

TABLE 5.3:   PERCENTAGE DISTRIBUTION OF BUST CUP CATEGORIES (n = 107)

Cup categories	Standards within range values	Count (%)
A	0 to < 5.0 cm	0 (0%)
B	≥ 5.0 cm to < 7.0 cm	1 (1%)
C	≥ 7.0 cm to < 9.0 cm	6 (6%)
D	≥ 9.0 cm to < 11.0 cm	36 (33%)
DD	≥ 11.0 cm to < 14.0 cm	42 (39%)
E and above	≥ 14.0 cm to ≤ 28 cm	23 (21%)

Bust cup (**Table 5.3**): Cup size and brassière size are determined by the size of the breasts. The dimension determining cup size is obtained by subtracting the under-bust dimension from the bust circumference dimension at the fullest part (Solinger, 1988:77; Spillane, 1995:85). In this study, the differences between the under-bust dimension and the bust dimension ranged from 5.00 cm to 28.00 cm. The cup sizes (**Table 5.3**) were then categorised according to standards given by Spillane (1995:85), but within the range values obtained by subtracting the under-bust dimension.

The results presented in **Table 5.3** show that participants with cup size **DD** (39%) and above (21%) were in the majority (60%), followed by participants with cup size **D** (33%). Participants with cup size **C** and **B** were least represented. These figures may suggest that Kenya's career women experience tight fit problems at the bust region. Comparisons were made between bust depth and cup size to determine whether they would yield similar results. From the bust extension, there were 81% participants with large busts, while 60% of the participants had cup size **DD** and above**.** However, both the techniques of identifying bust size indicated that the majority of the participants had large bust sizes.

5.2.2   Body shape identification

Body shapes have in the past been classified into the prevalent five figure types (hourglass, triangle, rectangular, apple and inverted triangle) by drop values. A drop value is the difference between the hip circumference and the bust circumference or the difference between the bust and the waist (Chun-Yoon & Jasper, 1993; Winks, 1997; Beazley, 1998; Gupta & Gangadhar, 2004; Yu, 2004:185). In this study, the different body shapes were defined based on the key dimensions: bust for the upper torso, waist for both upper and lower torso, and the hip for the lower torso. However, since body shapes and proportions vary with different countries and even regions within countries (Zwane & Magagula, 2006; Shin & Istook, 2007; Honey & Olds, 2007), it was necessary to understand the parameters from the literature that define and describe the five prevalent body shapes (hourglass, triangle, rectangular, apple and inverted triangle). The identified descriptions were then used to determine standards within the maximum and minimum (range values) dimensions of the drop values calculated **(Table 5.4)** for the purpose of identification of the distinctive body shape(s) of this study.

Specific drop values used for the categorisation of body shapes in this study are given in **(Table 5.4)**. Shin and Istook (2007) reported that the rectangular shape's waist measures nine inches (23 cm) less than the bust. Rasband and Liechty (2006:25-26) state that the waist of the hourglass body shape measures over 10 inches (25 cm) less than the hip or the bust. Using the range (maximum and minimum) dimensions of the drop values, in combination with Shin and Istook's (2007) and Rasband and Liechty's (2006) recommendations, it was possible to identify the different body shapes as presented in **Table 5.4**.

TABLE 5.4:   PERCENTAGE DISTRIBUTION OF BODY SHAPES (n = 123)

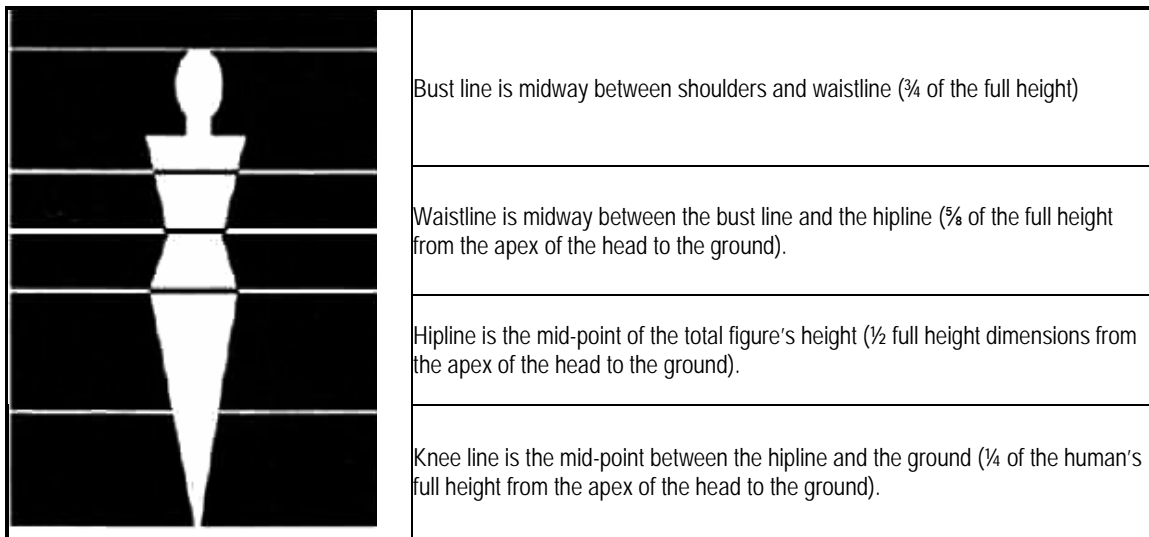| BODY SHAPE CATEGORIES				
Triangular and inverted triangle body shape categories 1st step: Triangle and Inverted triangle depend on bust and hip relationship and are opposite each other. Once these two body shapes were sorted out, they were not subjected further to waist and bust relationship				
Univariate analysis of drop values	Mean	SD	Maximum	Minimum
Hip subtract the bust	5.6 cm	8.8 cm	26.0 cm	-8.0 cm
Mean (5.6) +SD (8.8) = ≥ 14.0 cm to ≤ 26.0 cm (Max*)	Triangle (Large hips)			
Mean (5.6) - SD (8.8) = -8.0 cm (Min*) to > 3.2 cm	Inverted triangle (large bust)		2 (1.5%)	
Apple, Rectangular and Hourglass shape				
2nd step: Apple, Rectangular and Hourglass shape rely on bust and waist relationship, Rectangular = Waist 23.00cm less than the bust (Shin & Istook, 2007), Hourglass = waist 25 cm less than the bust (Rasband & Liechty, 2006). Categories were guided by the standards within the range values				
Univariate analysis of Bust subtract the waist drop values	6.0 cm	13.0 cm	36.0 cm	-13.0 cm
Standards within the maximum and minimum dimensions of the drop values	Body shape		Count (%)	
-13.0 cm (Min*) to ≤ 4.7 cm	Apple (Large waist)		2 (1.5%)	
> 23.0 cm to 36.0 cm (Max*)	Hourglass (Narrow waist)		2 (1.5%)	
> 4.7 cm to ≤ 23.0 cm	Rectangular/ Straight (Average waist)		93 (74%)	

* Min = Minimum range value; Max = Maximum range value

Table 5.4 clearly portrays that the rectangular body shape was the most (74%) prevalent body shape in the sample, followed by the triangle body shape (21.5%). The other body shapes (apple, hourglass and the inverted triangle) had the least representation of 1.5% each. Since most ready-made apparel is manufactured based on the hourglass body shape proportions, Kenya's career women are therefore likely to experience fit problems with ready-made apparel.

5.2.3   Height proportions

The ideal shape (fit model) used as a design base by the apparel industry has a well-proportioned/well-balanced body, both horizontally and vertically. Although height proportions are used mostly by artists and illustrators, imbalanced height proportions could also lead to fit problems. **Figure 5.2** illustrates height proportions in relation to the full height (Lyle & Brinkley, 1983:63; Le Pechoux & Ghosh, 2002:4).

	Bust line is midway between shoulders and waistline (¾ of the full height)
	Waistline is midway between the bust line and the hipline (⅝ of the full height from the apex of the head to the ground).
	Hipline is the mid-point of the total figure's height (½ full height dimensions from the apex of the head to the ground).
	Knee line is the mid-point between the hipline and the ground (¼ of the human's full height from the apex of the head to the ground).

FIGURE 5.2: IDEAL BODY SHAPE'S HEIGHT PROPORTIONS

(Adapted from: Lyle & Brinkley, 1983:63)

Using the height proportional relationship concept from Lyle and Brinkley (1983:63) and Le Pechoux and Ghosh (2002:4), the results of the height proportions of this study are presented in **Table 5.5**.

TABLE 5.5: PERCENTAGE DISTRIBUTION OF HEIGHT PROPORTIONS (n = 123)

Height proportions	Exact count (%)	Above count (%)	Below count (%)
Under-bust height (¾ height)	0	0	123 (100%)
Waist height (⅝ height)	0	103 (84%)	20 (16%)
Hip height (½ height)	6 (5%)	102 (83%)	15 (12%)
Knee height (¼ height)	0	123 (100%)	0

The results presented in **Table 5.5** above indicate that all (100%) the participants' bust height dimensions were below the ¾ standard of the ideal figure's normal bust position. This may therefore affect the size of the armhole, as well as the dart positions and style lines of a foundation pattern. The majority (84%) of the participants' waist heights were above the ⅝ height standard of the ideal figure's normal waist position, while only 16% of the participants' waist heights were below the ideal figure's waist position. This means that the majority of the participants' waistlines were situated higher than the ideal body's normal position, which may require re-identification of the waist dart positions and style lines in a base pattern.

Concerning the hip height, the results also indicate that the majority (83%) of the participants' hip height dimensions were above the ½ standard (ideal figure's) height position, while only 12% had hip heights below the standard. Only 5% of the participants had hip heights at

exactly ½ the standard height position of the ideal figure. This implies that the majority of the participants had their hiplines situated above the ideal figure's normal position, a typical characteristic of a Western rectangular shape (Rasband & Liechty, 2006:25). However, this could affect the style lines and side seam shaping in a foundation pattern. Concerning the knee height, all (100%) the participants' knee heights were above the standard ¼ heights, indicating that the majority of the participants' lower parts of their legs were longer than the ideal figure's normal position. The knee height position does not affect the fit of an apparel item, but could be used as a style guide point. It should be noted that these calculations were based on the exact standards stated above, and no tolerance allowance was provided.

5.2.4 Summary of body shape identification from body dimensions (Primary objective 1 (Sub-objective 1))

In summary, this study found that the majority of the participants were of medium height (75%) and had a distinctive rectangular body shape (74%). Participants with a triangle/pear body shape were the second most common type (20.5%) although they were less represented. Other characteristics that prevailed with the distinct body shapes (rectangular and triangle), were the large buttocks (69%), large thigh bulge (85%), large bust as indicated by the bust extension (81%), and large cup size (60%). The body shape was also characterised by a larger front arc at the bust and waistline regions, whereas the back arc dimension was large at the hip region. The body shape's height proportions showed that waistline, hip-line and knees were higher than the normal, ideal figure's height positions, whereas the bust line was situated below the normal height position.

5.3 IDENTIFICATION AND DESCRIPTION OF THE DISTINCTIVE FEMALE BODY SHAPE (S) OF PROFESSIONAL WOMEN IN KENYA FROM PHOTOGRAPHS (OBJECTIVE 1 (SUB-OBJECTIVE 2))

Photographs were taken from 89 career women within the ages of 25-55. Their ages were categorised into three groups namely: young adults aged between 25 and 32 years, a middle group aged between 33 and 40 years, and mature group aged 41 years and above. The middle-aged (33–40) were highly (43%) represented, while the young adults (25–32) were the secondly (32%) represented. The mature group (41 years and above) had the lowest (25%) representation. All the digital images were transferred to the computer for the purposes of cleaning, refining and organising them for evaluations.

In this study, it was decided that a Kappa statistic of 0.75 was the cut-off point for acceptable

agreement between the two trained professional evaluators. This implied that all the evaluations with the Kappa statistic of ≥ 0.75, and significant (p ≤ 0.05) agreements between the two evaluators, were accepted, while evaluated attributes with Kappa < 0.75 were rejected, but were further subjected to a group of professional expert evaluators to assess and to reach consensus on a given characteristic for final decisions. The categories of body features and body shape identified are presented according to the sequence of the body shape assessment scale (**Appendix 3D**).

5.3.1 Body build/size categories (V4 on the body shape assessment scale)

Participants were grouped into visual size categories, as body size plays an important role in the designing and distribution of ready-made apparel to the correct marketplaces (Winks, 1997). Presented in **Table 5.6** are the body build/size categories that emerged from the evaluations of the sample data. The results indicate that there were almost equal representations of each body build. Forty one per cent of the participants appeared to be of medium size, 33% of the participants appeared slender, while 26% appeared to be large in size. The inter-rater reliability between the two evaluators was good, as indicated by the Kappa statistic of 0.86. Statistically, there was significant (p > 0.0001) agreement between the two evaluators.

TABLE 5.6:   PERCENTAGE DISTRIBUTIONS OF BODY BUILD/SIZE CATEGORIES (n = 89)

| Visual body size/build categories	Evaluator 1 Count (%)	Evaluator 2 Count (%)	Average (%)	Inter-rater reliability	p
Slender group (small size)	29 (33%)	30 (34%)	33%		
Average (medium size)	34 (38%)	38 (43%	41%	0.86	0.0001*
Large group (plus size)	26 (29%)	21 (23%)	26%		

* Statistically significant (p ≤ 0.05)

Body build/size among different age groups: Comparisons were made between the different age groups and the body build/sizes to determine whether there were any significant associations between body build/sizes and age.

The results are presented in **Table 5.7,** show that the majority (63%) of the young adults (25-32) were in the smaller sized group, while 55% of the middle-aged group (33-40) appeared to be of medium built. Fifty two per cent and 43% of the mature group (41+) appeared to be of large and medium build, respectively. Statistically there was significant (p > 0.0001) agreement between the two evaluators. These results may possibly suggest that as females mature, their weight tends to increase much more than in young adults (**Figure 5.3**).

TABLE 5.7:   BODY BUILD/SIZE AMONG DIFFERENT AGE GROUPS

AGE (YEARS)	Small (%)				Medium (%)				Large (%)			
	Evaluator 1	Evaluator 2	Average (%)	p	Evaluator 1	Evaluator 2	Average (%)	p	Evaluator 1	Evaluator 2	Average (%)	p
25-32 (n = 29)	61	64	63 %		28	25	26%		11	11	11%	
33-40 (n = 38)	17	17	17%	0.0001*	48	62	55%	0.0001*	34	21	28%	0.0001*
41 + (n = 22)	5	5	5%		41	45	43%		54	50	52%	

*Statistically significant ($p \leq 0.05$)
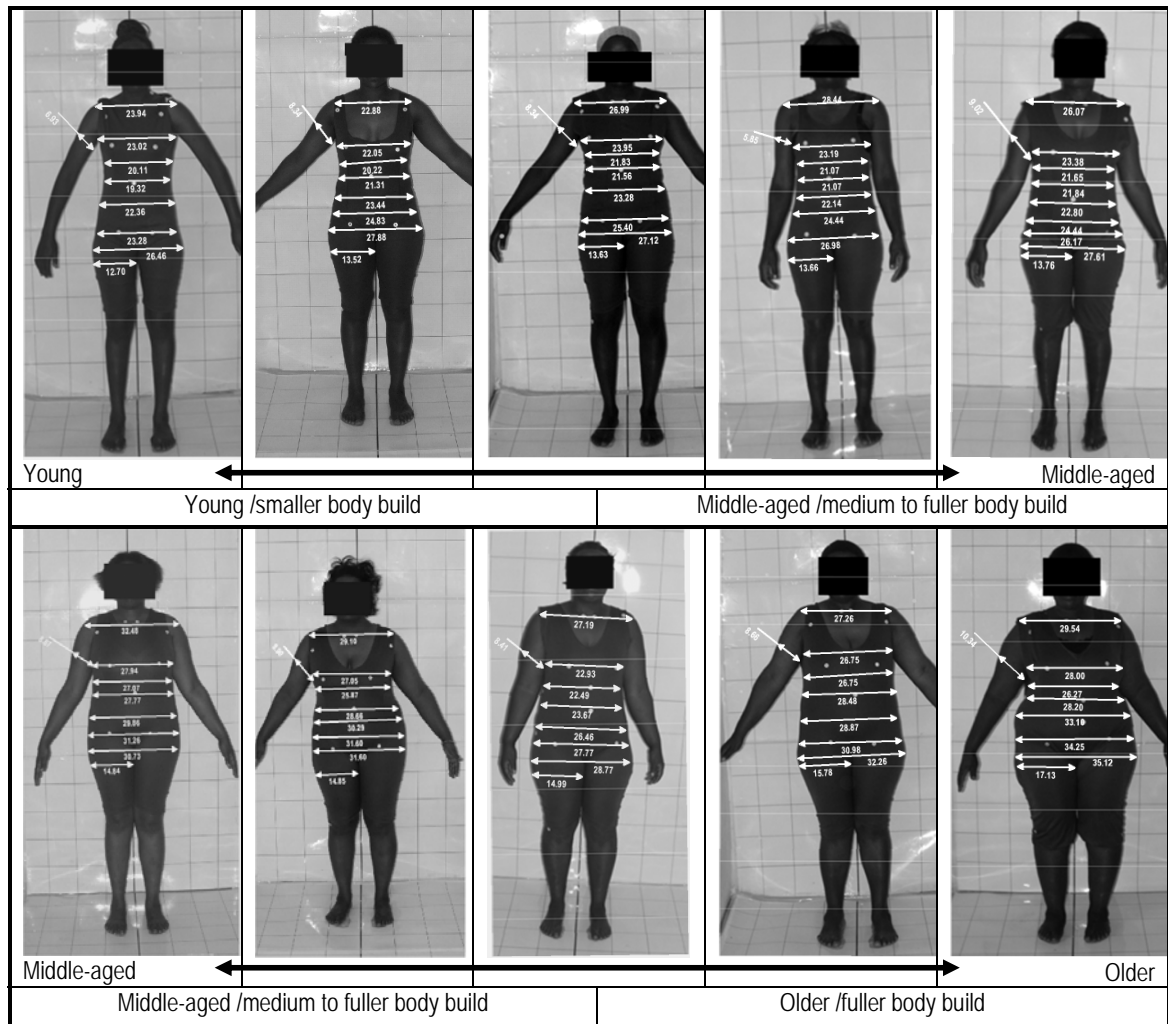
FIGURE 5.3:   BODY BUILD/SIZE VERSUS AGE

5.3.2   Bust/shoulder width versus hip width appearance, and waist size versus hip width (V5 and V6 on the assessment scale)

When using body dimensions, body shape classifications are based on a derived parameter drop value (Winks, 1997; Beazley, 1998; Gupta & Gangadhar, 2004). However, visual analysis does not use the drop values as in the case of dimensions, but uses visual analysis to provide an estimate of how the bust/shoulder and waist sizes compare to each other. The two attributes were subjected to a group of professional expert evaluations because inter-rater reliability was below the Kappa statistic of ≥ 0.75 (0.66 and 0.68). The results are presented in **Table 5.8**.

TABLE 5.8:   PERCENTAGE DISTRIBUTION OF THE BUST/SHOULDER AND WAIST SIZE APPEARANCE VERSUS THE HIP WIDTH APPEARANCE (n = 89)

Categories			Evaluations by a group of professional experts (%)	Possible body shape
Bust/ shoulder size versus hip size		Narrow	12 (13%)	Triangle/Pear
		Similar	74 (83%)*	Rectangular, Hourglass or Apple
		Wider	3 (3%)	Inverted triangle/Barrel
Waist size versus hip size		Narrow	8 (11%)	Hourglass
		Similar	62 (84%)	Rectangular
		Wider	4(5%)	Apple

* Subjected to waist size versus hip size

Table 5.8 clearly demonstrates that 83% of the participants' bust/shoulder sizes appeared similar in width to their hip sizes, suggesting the possibility of rectangular, apple or hourglass body shapes. Participants with bust/shoulders appearing narrower than the hips were 13% (this could suggest the possibility of pear/triangular shapes). The least represented group (6%) were those with busts appearing wider than the hip size, suggesting a possible inverted triangular/barrel shape. At this stage, it was unclear as to whether the majority of the participants could possibly be identified with the rectangular, hourglass, or apple body shape.

To isolate the rectangular shape from the hourglass and the apple body shapes, the waist thickness was further compared to the hip width appearance (**V6 on the body shape assessment scale)** – only on the 74 (83%) participants with waist size similar to bust size. The results indicate that the majority of the participants with waist size appearing similar to the hip size were 84% (signifying a possible rectangular body shape). The participants whose waist size appeared narrower than the hip size were 11% (indicating a possibility of an hourglass body shape). Participants whose waist size appeared wider than their hip size

were 5% (suggesting a possible apple shape). This indicates that the majority of the participants had a rectangular body shape.

5.3.3 Stomach and buttocks appearances (V7 and V8 on the body shape assessment scale)

Stomach size and shape plays an important role in the design of apparel items. Its size, shape and position would affect the fit of the apparel item around the waist region. Its size could also affect the crotch line as well as the hang of apparel (Rasband, 1994:66, 68). Buttocks size and shape is also an important body characteristic that affects the fit of apparel around the hip region, the crotch line and even the drape (Rasband & Liechty, 2006:324). Results of visual stomach and buttocks shape evaluations are presented in **Table 5.9**.

TABLE 5.9: **PERCENTAGE DISTRIBUTION OF COMMON STOMACH AND BUTTOCKS SHAPES (n = 89)**

Categories		Evaluator 1 Average (%)	Evaluator 2 Average (%)	Average (%)	p	Inter-rater reliability
Visual shape of the stomach	"D"	65 (73%)	59 (66%)	70%	0.0001*	0.81
	"b"	15 (17%)	19 (21%)	19%		
	Flat	9 (8%)	11 (13%)	11%		
Visual shape of the buttocks	"d" (large)	81 (91%)	81 (91.5%)	91%	0.0001*	0.94
	No "d"(Average	8 (9%)	8 (8.5%)	9%		
	Flat	0 (0%)	0 (0%)	0 (0%)		

*Statistically significant ($p \leq 0.05$)

The stomach "**D**" shape is defined from the body's profile view, where the front part of the body is characterised by an extension of fullness appearing like a letter "**D**" from below the bust line extending down to the crotch line. Stomach "**b**" shape is defined from the body's profile view, where the stomach's fullness (roundness) begins below the waistline, appearing like a letter "**b**". **Table 5.9** clearly depicts that the majority (70%) of the participants had stomach protrusions appearing similar to the letter "**D**"**.** The inter-rater reliability for these evaluations was good, as indicated by a Kappa statistic of 0.81. Statistically there was significant ($p > 0.0001$) agreement between the two evaluators. Participants with stomach protrusions appearing similar to the letter "**b**" and flat were only 19% and 11% respectively. The results suggest that Kenya's career women are likely to experience tight fit problems with ready-made apparel along their front torsos.

The buttocks' "**d**" shape is defined from the body's profile view, with the buttock distinction or conspicuity that appears like the letter "**d**" as it stands out or extends at the lower back section. **Table 5.9** clearly shows that the majority (91%) of the participants appeared to have large buttocks appearing like the letter "**d**". Participants whose buttocks did not appear like the letter "**d**" were 9%, while none of the participants appeared to have flat buttocks. The inter-rater reliability for the evaluations was good, as indicated by a Kappa statistic of 0.94, while there was significant (p > 0.0001) agreement between the two evaluators. The results suggest that Kenya's career women are likely to experience tight fit problems around the hip and the crotch lines of apparel.

Stomach shape among different age groups: Comparisons were made between the different age groups and the stomach prominence to determine whether there were any associations between stomach shapes and the different age groups. The "**b**" stomach shapes were combined with flat stomach shapes, because from **Table 5.9**, the "**b**" and flat stomach shapes were least represented (30%). They were also grouped together because they appeared similar. The results are presented in **Table 5.10**.

TABLE 5.10: PERCENTAGE DISTRIBUTION OF COMMON STOMACH SHAPES ACCORDING TO AGE GROUPS (n = 89)

Age (years)	Stomach "D" shape Averaged (%)	Stomach "b" and flat shape Averaged (%)	p
25-32 (n = 29)	50 %	50%	
33-40 (n = 38)	91%	9%	0.0001*
41 + (n = 22)	93%	7%	

* Statistically significant (p ≤ 0.05)

Table 5.10 shows that the majority (93%) of the mature age group and the majority (91%) of the middle-aged group had stomach protrusions that appeared like the letter "**D**", while only 50% of the young adults had stomach protrusions appearing like the letter "**D**". Among the young adults, 50% had stomach protrusions appearing like the letter "**b**". Statistically, there were significant (0.0001 ≤ 0.05) associations between age group and the presence of the stomach shape "**D**". It is possible that the mature females' fat deposits tend to spread all over the front torso much more than in the younger group, as shown in **Figure 5.4**.

5.3.4 Upper back curvature and the back waist curvature/shape (V9 and V10 on the body shape assessment scale)

Upper back and the back waist curvatures are important characteristics that would affect the fit of apparel items around the shoulder blades, the midriff region at the back as well as the

balance of an apparel item from the profile view. Inter-rater reliability for these two variables between the two evaluators was lower (0.69 and 0.68) than the Kappa statistic of 0.75, and therefore, they were subjected to a group of professionals' expert assessment. The results are presented in **Table 5.11**.

TABLE 5.11: PERCENTAGE DISTRIBUTION OF THE UPPER BACK AND THE BACK WAIST CURVATURES (n = 89)

Categories			Three expert evaluators	
			Frequency	Percentage (%)
Upper back shape curvature		Fully rounded upper back	70	79%
		Moderately rounded upper back	13	15%
		Straight upper back	6	6%
Back waist curvature		Deep hollow waist	67	75%
		Moderately hollow waist	19	21%
		Straight/flat/non-hollow waist	3	4%

Table 5.11 above shows that the majority (79%) of the participants appeared to have a fully rounded upper back, while the moderately rounded upper backs and flat backs were least represented. It is also apparent that the majority (75%) of the participants had a deep hollow back waist, while participants with a moderate hollow back waist and a straight back waist were least represented. It appears that the pronounced rounded upper back and the large buttocks (**Table 5.9**) result in the deep hollow back waistline. However, a consumer with the rounded upper back in combination with a hollow waistline is likely to experience tight fit problems at the shoulder blade region and loose fit (sagginess) around the waistline. The balance of the apparel is also likely to be affected as a result of this body configuration.

Upper back and back waist curvatures among different age groups (**Table 5.12**): Comparisons of the upper back and the back waist curvatures were made between the different age groups to determine whether there were any significant associations between the upper back and back waist curvatures among the different age groups. The results are represented in **Table 5.12**.

The results (**Table 5.12**) show that there were more (59%) of the young adults (25-32) with fully rounded upper back, followed by the middle-aged (33-40) group (53%) with fully rounded upper backs, and only 34% in the mature group had rounded upper backs. However, more (55%) of the mature (41+) and about half (47%) of the middle-aged (33-40) groups had moderately rounded upper backs, while only few (38%) of the young adults (25-32) had moderately rounded upper backs. From these results, it may be reasoned that as the

females get older, the upper back possibly tends to fill up with fat deposits or the muscles slacken, making the shape at the back appear moderately rounded or flat (**Figure 5.4**).

Younger — Older

| Rounded upper back and a less pronounced "D"-shaped stomach | Rounded upper back and a more pronounced "D"-shaped stomach |
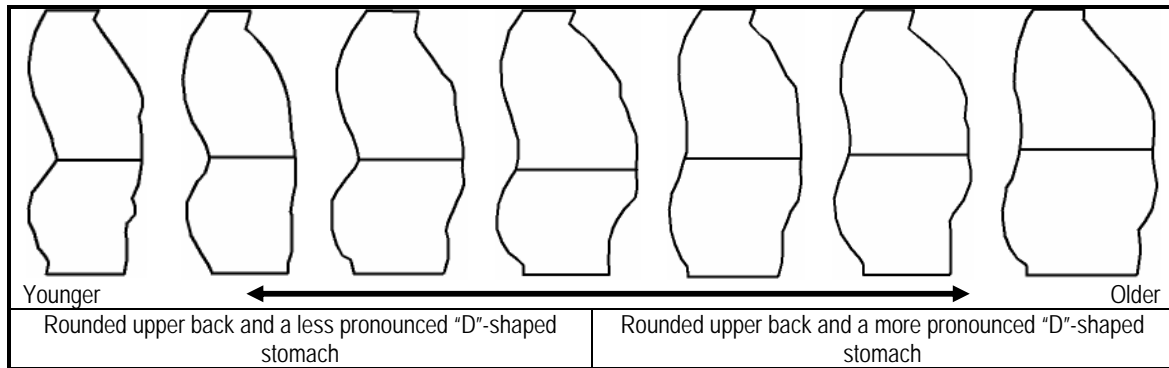
FIGURE 5.4:   PROFILE VIEW CHARACTERISTICS AMONG DIFFERENT AGE GROUPS

TABLE 5.12: PERCENTAGE DISTRIBUTION OF THE UPPER BACK AND BACK WAIST CURVATURES AMONG DIFFERENT AGE GROUPS (n = 89)

		Age groups (years)		
Categories		25-32 (n = 29)	33-40 (n = 38)	41 + (n =22)
Upper back curvature	Fully rounded upper back	59%	53%	34%
	Moderately rounded upper back	38%	47%	55%
	Flat upper back	3%	0%	11%
Back waist curvature	Deep hollow waist	46%	48%	39%
	Moderately hollow waist	46%	45%	48%
	Flat waist/non-hollow	8%	7%	13%

Regarding the back waist curvature, it is clear that there was almost equal representation among the middle-aged (48%), the young adults (46%) and the mature group (39%) concerning the deep hollow back waist region. Approximately the same balanced percentage distribution pattern was also observed with the mature group (48%), the young adults (46%) and the middle-aged group (45%), regarding a moderately hollow back waist region.

5.3.5   Thigh bulge, upper arm and shoulder categories (V11, V12 and V13 on the body shape assessment scale)

Thigh size/bulge is an important characteristic that would affect the fit of apparel at different points of the hipline region (Rasband & Liechty, 2006:324). Shoulder shape, size or its direction is also an important characteristic that would affect the drape and fit of apparel. Inter-rater reliability for these two variables (0.62 each) was below the Kappa statistic of 0.75 – hence the need to subject the participants' images to a group of expert evaluators. Upper

arm size affects the fit of apparel items at the sleeve's upper arm or at the crown region (Rasband, 1994:106-108), thus the need to understand consumers' upper arm sizes. The results of the thigh bulge, shoulder and upper arm categories are presented in **Table 5.13**.

TABLE 5.13: PERCENTAGE DISTRIBUTION OF THE UPPER ARM, THIGH BULGE AND SHOULDER SHAPE CATEGORIES (n = 89)

Categories		Evaluator 1 Average (%)	Evaluator 2 Average (%)	Average from a group of professional expert evaluators (%)	P	Inter-rater reliability
Upper arm size	Thin	0 (0%)	1 (0%)	0%		
	Average	38 (43%)	34 (38%)	41%	0.0001*	0.86
	Full	51 (57%)	54 (61%)	59%		
Thigh bulge	Large	-	-	38 (43%)		
	Moderate	-	-	30 (33%)	Three expert evaluators	
	Flat	-	-	21 (24%)		
Shoulders shape	Normal	-	-	52 (58%)		
	Squared			22 (25%)	Three expert evaluators	
	Sloped	-	-	15 (17%)		

*Statistically significant (p ≤ 0.05); (-) not applicable

Table 5.13 indicates that the majority (59%) of the participants had full biceps/upper arms, while participants with moderate/average biceps/top arm were 41%. No participants had thin upper arms. The inter-rater reliability for the evaluations was good, as indicated by a Kappa statistic of 0.86. Statistically there was significant (p > 0.0001) agreement between the two evaluators. This implies that Kenya's career women are likely to encounter tight fit problems around the biceps region.

Concerning the thigh bulge, it is clear that the largest group (43%) of the participants had large thigh bulges, while 33% participants appeared to have moderate thigh bulges. Only 24% of the participants had flat thighs. Large thigh bulges in combination with large buttocks would exaggerate fit problems around the hip and crotch line of apparel. Regarding the

shoulder shape, the majority (58%) of the participants had normal shoulder shapes. Only 25% and 17% had squared and sloped shoulders respectively. These results suggest that Kenya's career women are likely to encounter minimal shoulder fit problems.

5.3.6   Body shape form (variable 14 on the body shape assessment scale)

Body shape form has been seen as a solution to the fit problems of ready-made apparel (Simmons, Istook & Devarajan, 2004a; Simmons, Istook & Devarajan, 2004b; Connell *et al.*, 2006). On the body shape assessment scale, the last question required a holistic (profile and silhouette) description of the body shape and possibly a category within the five prevalent types (hourglass, rectangle, triangle, apple and inverted triangle) to be assigned to each shape evaluated. The inter-rater reliability from the two expert evaluators for this variable was a Kappa statistic of 0.42 – below the 0.75 cut-off point. Therefore it was subjected to a group of professionals' expert evaluations. The results are presented in **Table 5.14**.

TABLE 5.14: PERCENTAGE DISTRIBUTIONS OF BODY SHAPE CATEGORIES (n = 89)

Body shape categories	Frequency	Percentage (%)
Rectangular/straight	62	70%
Pear / triangle	12	13%
Hourglass	8	9%
Barrel / inverted triangle	3	3.5%
Apple	4	4.5%

It is clear from **Table 5.14** that the majority (70%) of participants appeared to have a rectangular body shape, while participants who appeared to have a pear body shape were 13%. The rest of the body shapes were hardly represented. The predominant body shape that emerged from the evaluations was the rectangular body shape. Although the pear/triangle body shape was less represented in this study, it emerged as the second most distinctive body shape. Considering that ready-made apparel designs are based on the hourglass body shape, Kenya's career women with their rectangular shape are therefore likely to encounter fit problems.

5.4   DESCRIBING ASSOCIATIONS BETWEEN THE DISTINCTIVE SHAPES EMERGING FROM BODY DIMENSIONS AND THOSE EMERGING FROM THE PHOTOGRAPHS OF THE CAREER WOMEN (OBJECTIVE 1 (SUB-OBJECTIVE 3))

Figure 5.5 represents the results of the comparisons of the distinctive body shapes obtained from the body dimensions and those obtained from the photographs, calculated as percentages.

Emerging body shapes

	Rectangle	Triangle	Hourglass	Apple	Inverted triangle
☐ Shape from measurements (n = 123)	74	21.5	1.5	1.5	1.5
☐ Shape from photographs (n = 89)	70	13	9	4.5	3.5
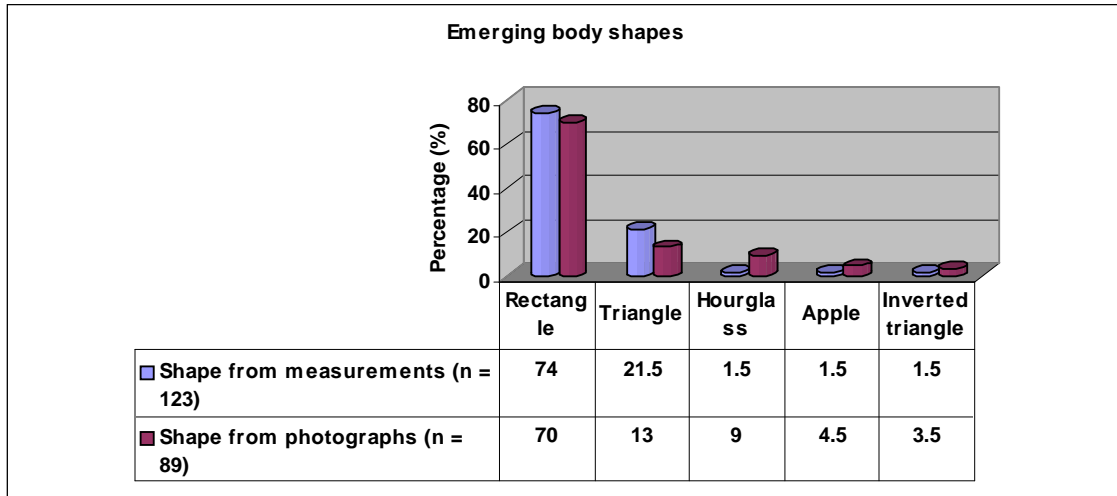
FIGURE 5.5: EMERGING BODY SHAPES FROM THE DIMENSIONS AND EVALUATIONS

Figure 5.5 above indicates that the rectangular body shape was the most distinct body shape emerging from both the dimensions (74%) and the evaluations of the photographs (70%). The second most distinct body shape emerging from both the dimensions (21.5%) and the evaluations of the photographs (13%) was the triangle body shape – although the percentage representation differs. The rest of the body shapes were least represented.

5.4.1   Comparing the characteristics of the distinctive body shape emerging from the body dimensions and from the evaluations of the photographs

Considering that body dimensions are one-dimensional elements, it would not be possible to isolate contours and precisely locate the positions of body characteristics such as buttocks and bust contours along circumferential dimensions. Images taken from different angles facilitate comprehensive scrutiny on the size/depth of any contours and any outlines that appear on the body. It is therefore possible to segregate body characteristics with the use of two body shape identification techniques, namely using body dimensions and evaluations of

photographs. Characteristics that were identified using both techniques are presented in **Table 5.15**. Characteristics that were not possible to identify concurrently using both techniques were: the bust and the height proportions (identified through body dimensions), the body builds, stomach, upper back curvature, back waist curvature and the top arm (identified through visual evaluations of the photographs).

TABLE 5.15: DISTINCTIVE BODY FEATURES IDENTIFIED USING BODY DIMENSIONS AND VISUAL EVALUATIONS OF PHOTOGRAPHS

Body shape's features	Category	Body dimensions (%) (n = 123)	Visual evaluations (%) (n = 89)	Differences (%)
Thigh bulge	Small	0%	24%	24%
	Moderate	85%	33%	52%
	Large	15%	43%	28%
Buttocks	"d" (large)	69	91	22%
	Moderate	29	9	22%
	Flat	0	3	3%
Shoulder	Normal	67	58	9
	Squared	14	25	11
	Sloped	19	17	2
Profile view balance	Front upper torso	100	88	12

Table 5.15 indicates that the majority of the participants had a moderately large thigh bulge, 85% from the body dimensions and 52% from visual evaluations of photographs. It was also clear that large buttocks recorded high percentages of 91% from visual evaluations and 69% from body dimensions. Shoulder shape categories maintained almost equal percentage scores, with the normal category taking the lead (67% participants from the body dimensions and 58% from the visual evaluations). Regarding the arc dimensions, the majority of the participants' front bust and stomach arcs were larger than the back (back width) and waist arcs from both the body dimensions (100%) and the visual evaluations of photographs (88%).

From these results, it is also clear that both techniques produced significant results, although there were distinct percentage differences on some of the characteristics. The percentages ranged from 2, which was the lowest, to 52 being the highest. The differences may have been caused by varying sample sizes used for body dimensions (n = 123) and photographs (n = 89). It should be noted that visual analysis provides estimates of sizes, while the actual measurements give exact dimensions.
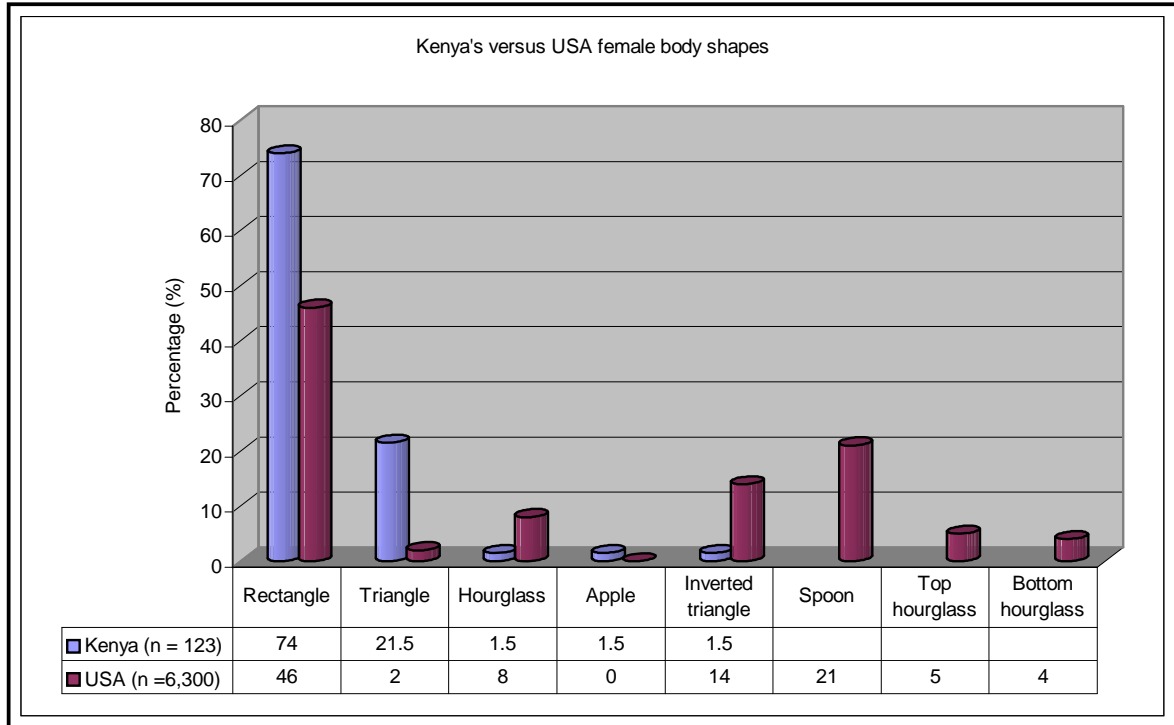
5.4.2 Summary on the identification of body shapes through body dimensions as well as evaluation of photographs

The study demonstrated that the prevalent body shape that emerged from the body dimensions and evaluation of the photographs was the rectangular body shape, which is typified by medium height, large buttocks, large thighs and large stomachs appearing like the letter "**D**". It is further characterised by a rounded upper back and a hollow back waist (lordosis curve) – making the shape appear imbalanced from the side view (**Figure 5.10**). However, more of the mature females appeared larger (**Figure 5.3**), with protruding stomachs ("**D**"), and a moderately rounded upper back (**Figure 5.4**). The majority of the younger females appeared smaller, with fully rounded upper backs and half of them had "**D**"-shaped stomachs, while the other half had "**b**"-shaped stomachs (**Figures 5.3** and **5.4**).

The results from both the body dimensions and the evaluations of the photographs further demonstrate that both techniques when combined yield even better results which can address apparel fit problems more closely. However, it is almost impossible to identify all the body shape characteristics using one method only. Considering that body scan technology is not popular in developing countries due to its cost and the technology involved (Xu *et al.,* 2002; Ashdown & Dunne, 2006), it may be reasoned that in the meantime, both the body shape identification techniques (from the dimensions as well as visual evaluations of photographs) could be used simultaneously to produce reasonably reliable results.

5.5 DISTINGUISHING AND DESCRIBING DIFFERENCES BETWEEN THE EMERGING DISTINCTIVE BODY SHAPES (FROM DIMENSIONS AND PHOTOGRAPHS) AND THE WESTERN DISTINCTIVE BODY SHAPE (PRIMARY OBJECTIVE 2)

The rectangular body shape is the prevalent female body shape among Kenyan career women. This finding is consistent with Istook's (2005) study in the United States of America. **Figures 5.6**, **5.7**, **5.8**, **5.9** and **5.10** compare the body shapes that emerged from this study with similar data from the USA. It should be noted that this study used only three basic dimensions (bust, waist and hips) for defining body shape, while the FFIT© software used by Devarajan and Istook (2004) to classify America's female shapes, used six dimensions (bust, waist, hips, high hip, abdomen and stomach). Based on the differences in classification techniques applied in the two studies and the different sample sizes, it would be unrealistic to make any conclusive comparisons.

Kenya's versus USA female body shapes

	Rectangle	Triangle	Hourglass	Apple	Inverted triangle	Spoon	Top hourglass	Bottom hourglass
Kenya (n = 123)	74	21.5	1.5	1.5	1.5			
USA (n =6,300)	46	2	8	0	14	21	5	4

FIGURE 5.6:   COMPARISON OF DISTINCTIVE FEMALE BODY SHAPES IN KENYA AND THE UNITED STATES OF AMERICA

| True Hourglass | Bottom hourglass | Triangle | Rectangle | Spoon | Apple |
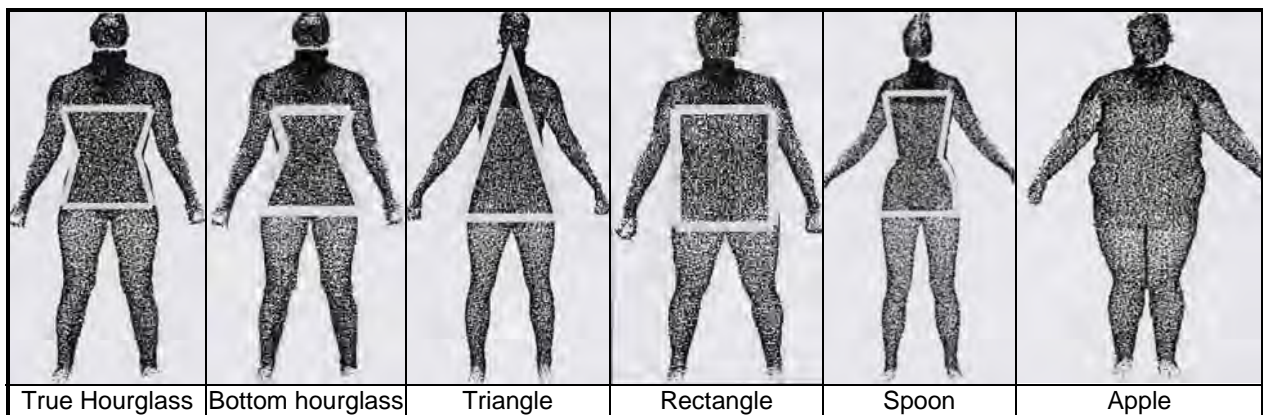
FIGURE 5.7:   AMERICA'S BODY SHAPES (Simmons, Istook and Devarajan, 2004b)

The results of this study (**Figure 5.6**) show that the rectangular body shape is the strikingly distinctive body shape found in both America and Kenya. In contrast, the triangle body shape is the second most common body shape occurring in Kenya's career women, while America's second most distinctive body shape is the spoon shape, which did not feature at all in this study.

| Hourglass | Triangle | Rectangle | Inverted triangle | Apple |
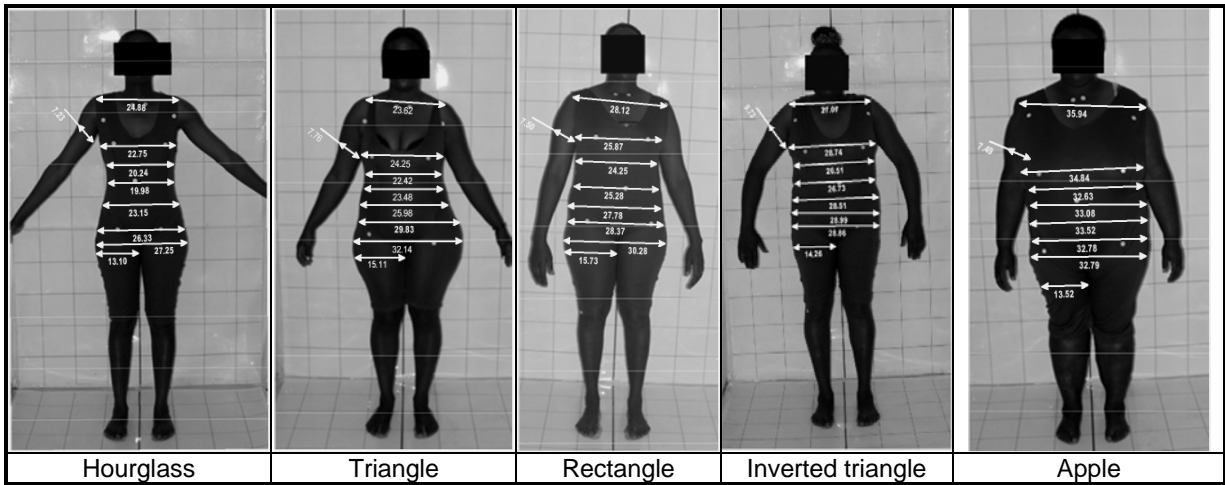
FIGURE 5.8: KENYA'S BODY SHAPES (Source: Present study)

The Western rectangular body shape, according to Rasband and Liechty (2006:25), has a strong ribcage and upper hip tapering a little towards the waist, or sometimes not tapering at all. The shoulder width appears similar to the hip measurement, with very little waist indentation. Waist circumference measures 9 inches (23 cm) less than the hip or bust circumference (Shin & Istook, 2007), the bust is small and there is no thigh bulge. The side view characteristics mentioned are the large stomach and a more flat back curvature: right from the upper back to the buttocks appears like the apple body shape's profile (**Figure 5.9**). Rasband and Liechty report that once a rectangular shape attains more weight, it results in an apple shape (Rasband & Liechty, 2006:25-26).

FIGURE 5.9: SIDE VIEW CHARACTERISTICS OF AN APPLE SHAPE ASSUMED TO BE AN APPROXIMATE REPRESENTATION OF THE SIDE VIEW CHARACTERISTICS OF THE RECTANGULAR BODY SHAPE

(Source: Simmons, Istook & Devarajan, 2004b)

In this study (**Figure 5.10**), the emerging rectangular front view shape is characterised by a shoulder width that is similar to the width of the hips, and a small waist indentation of less than 9 inches (23 cm). The thighs on the side bulge out beyond the hip width and are full at the inside (crotch), in contrast to the Western body shape. A rounded upper back characterises the profile view, with more roundness concentrated just below the shoulder line and the chest. The back curvature tapers narrowly towards the waistline and abruptly meets the full buttock contour, resulting in a deep hollow waist region (lordosis curve). The front side of the profile view is characterised by a high abdominal contour that begins to protrude just below the bust line. It begins to curve round almost instantly, and increases as it leads down to the crotch at the centre of the body, resulting in a "**D**" appearance. A brief description of this kind of body shape would be a curvy, rectangular female body shape.

| Front view | Profile view |
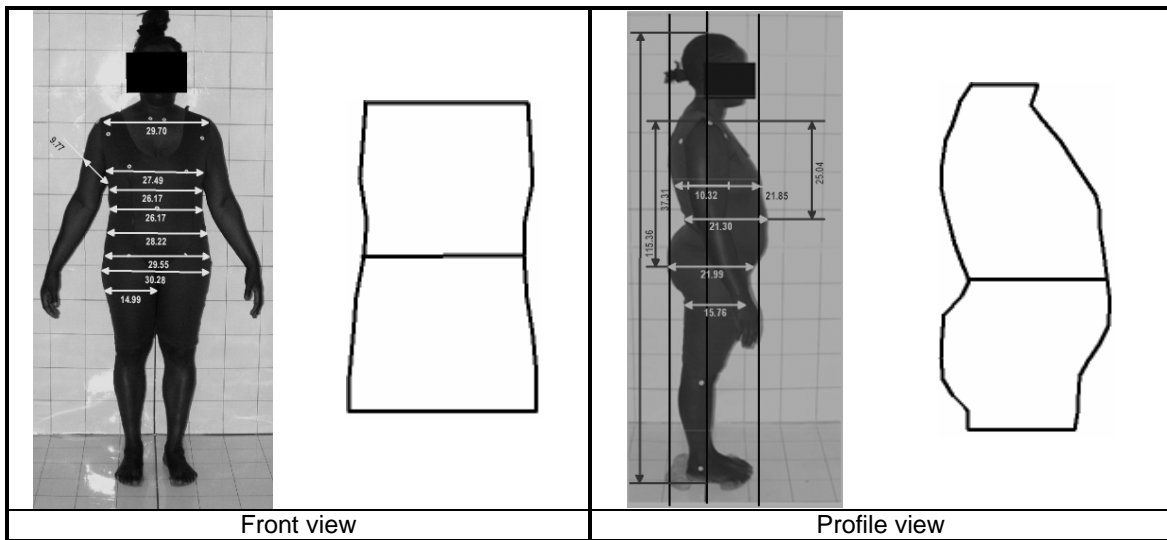
FIGURE 5.10: CURVY RECTANGULAR BODY SHAPE

The second most prevalent shape in this study (**Figure 5.11**) is the triangular body shape, which differs from the second most prevalent spoon body shape of America. As mentioned earlier, it would be unrealistic to make conclusive comparisons because of the different sizes of population samples, techniques used to obtain body dimensions and methods of identifying body shapes by the two studies.

| Front view | Profile view |
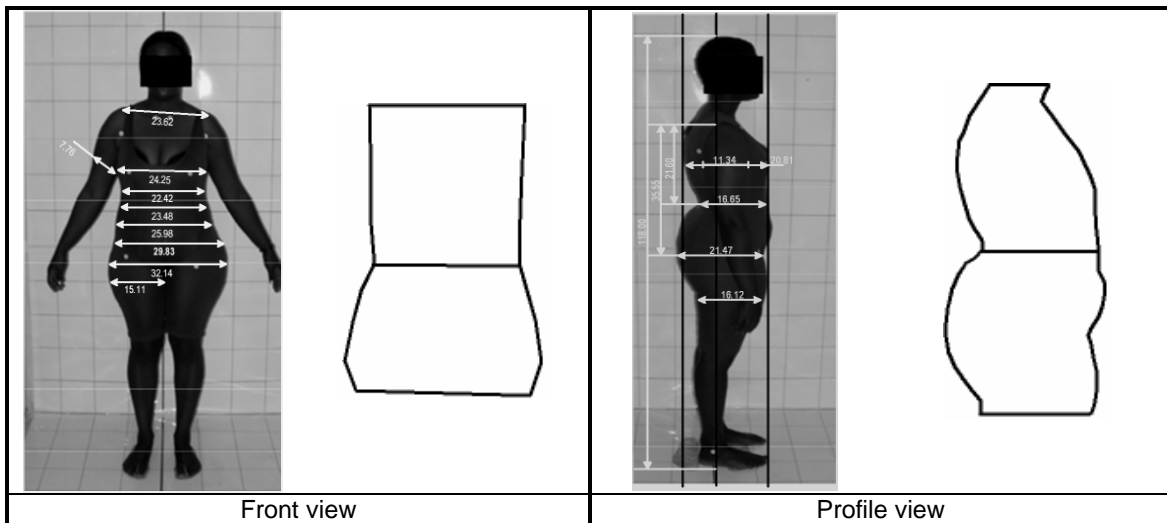
FIGURE 5.11: CURVY TRIANGULAR BODY SHAPE

Although the triangular body shape was less (21.5%) represented in this study (**Figure 5.11**), the emerging triangular front view shape is characterised by narrow shoulders and hips. The shoulder, bust width and waistline region appear to be similar in width. The body immediately curves outward from the waistline downward to the hip line and further to the thigh region. The thighs on the side bulge out beyond the hip width and are full at the inside. A rounded upper back characterises the profile view, with more roundness concentrated just below the shoulder line and the chest. The back curvature tapers down narrowly towards the waistline and abruptly meets the full buttock contour, resulting in a deep hollow waist region (lordosis curve). The front profile view is characterised by a low abdominal contour that begins to protrude just below the waistline, curving round instantly and increasing as it leads down to the crotch at the centre of the body. A brief description of this kind of body shape would be a curvy, triangular female body shape.

5.6 SCRUTINISING AND DESCRIBING FIT IMPLICATIONS ASSOCIATED WITH THE EMERGING DISTINCTIVE RECTANGULAR BODY SHAPE OF CAREER WOMEN (PRIMARY OBJECTIVE 3)

Ready-made apparel items are designed based on the Western hourglass body shape that is viewed as the ideal shape (Ashdown & Dunne, 2006; Shin & Istook, 2007). Most sizing systems used in developing countries are just adaptations of the Western sizing systems (Zwane & Magagula, 2006). The latest anthropometric data collected in the USA (2003) as well as the United Kingdom has not been analysed and implemented by apparel industries as sizing systems (Devarajan & Istook, 2004; Newcomb & Istook, 2004b; Simmons, Istook &

Devarajan, 2004a; Istook, 2005). This then calls attention to the Western sizing systems that are currently in use to facilitate comprehensive comparisons with the findings of this study. Newcomb and Istook (2004a) confirmed that junior and misses standards were based on the hourglass body shape, which is viewed as an ideal shape – a phenomenon that is supported by various studies (Zwane & Magagula, 2006; Pisut & Connell, 2007). Therefore, it is appropriate that the rectangular body shape found to be prevalent in this study, be compared to the hourglass body shape (fit model) in order to facilitate a deeper understanding of the fit problems experienced by Kenya's career women.

5.6.1 Fit implications for apparel associated with the curvy female rectangular body shape

The study revealed that critical fit points of the distinct rectangular body shape of the career women in Kenya deviate from the fit points of the well-proportioned fit model's characteristics. The varied critical fit points common to the distinct body shape of this study, are the large buttocks, the thighs, the curvy back profile shape, the large stomach, unproportional key height points (bust, waist, hip and knee) and the large, low bust. The fit implications of these critical fit points associated with the rectangular distinctive body shape of this study are discussed below.

5.6.1.1 Fit implications associated with the size of the buttocks/derriere and the thighs

The buttocks and thighs are situated around the hip region and therefore influence the circumferential dimensions around the hipline. These may have similar or closely related fit implications for the apparel. Although the hipline (trochanterion) was positioned above the normal hipline (½ height) for most participants (**Table 5.5**), nonetheless, it is a typical characteristic of a Western rectangular shape. The broadest hip position (thigh bulge) situated at approximately 10 cm below the normal hipline, could possibly affect the fit of an apparel item more than the high hip position.

The buttocks/derriere: The findings of this study indicated that there were 91% and 69% of the participants with large buttocks according to visual evaluations and body dimensions, respectively. This suggests that the majority of the participants are likely to experience tight fit problems around the hip region and the crotch line. Over-sized buttocks that curve outwards more than the ideal shape's buttocks, can cause fit problems around the buttocks, hip and crotch lines. The fabric width, and the length or the curved shaping in an apparel item may not be sufficient enough to accommodate the fullness of the buttocks comfortably and attractively. The fabric is likely to be strained and pulled tight across the buttocks,

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causing the side seam to bow backward at the hipline level, while the skirt hemline is likely to pull up at the back and hang down longer at the front. The shallow area above the buttocks may cause excess fabric to form layers of folds as the apparel item rides up (Rasband, 1994:134-135; Rasband & Liechty, 2006:314, 324, 336). This may result in tight diagonal ripples forming towards the buttock curve on skirts, and towards the crotch on pants. The waistband may be pulled down at the back for pants, and may generally affect the length of the skirt.

The bulging thighs: In this study there were 76% career women with large thighs, as judged from the visual evaluations. This suggests that the heavy thighs (inside and outside) could have fit implications due to the size and position in comparison with the ideal shape's size and position. Heavy/bulging thighs positioned lower than the normal position of the ideal shape will affect the way that pants and skirts fit. There will be less fabric width to go round the thighs, leading to tight horizontal ripples or folds forming round the upper thigh just below the hipline. There will be horizontal ripples radiating from the crotch line towards the outside thigh and the fabric may "cup" under the thighs and the buttocks. Skirts' hemlines will tend to pull on the sides (Rasband & Liechty, 2006: 340).

All the participants' knee height positions were above the normal position (¼ height) of the ideal figure (**Table 5.5**). Although there is a disparity with the ideal shape's height proportions, fit problems are unlikely to occur but may only affect style line position (shaping).

5.6.1.2 Fit implications associated with the large stomach size

The study indicated that the majority (70%) of the Kenyan career women had a high abdomen, appearing like the letter "**D**" from the visual evaluations. This suggests that the stomach protrusion exceeds the shape of the ideal shape. Apparel made on the basis of the ideal shape's proportions will therefore have less fabric length and width or even insufficient curved shaping to fit comfortably and nicely over the abdomen. In skirts and dresses, tight horizontal folds are likely to form above the abdomen as the apparel item rides up. The side seams will tend to bow forward between the hip and the waist, while angled ripples may also form towards the stomach curve. With fitted skirts or dresses, the hemline may be pulled up in front, causing a "poke out" at the centre. On pants, wrinkles may form between the crotch and abdomen. The crotch seam is likely to be pulled up uncomfortably and to cut tightly through the body (Rasband & Liechty, 2006:206, 296, 304; *Reader's Digest*, 2002:53).

Most (84%) of the participants' waist height positions were above the normal position (⅝ height) (**Table 5.5**). A dress made on the basis of the ideal shape's height proportions is

likely to fit tightly at the midriff region, as style lines and darts positions would not be in harmony with the shape underneath the dress.

5.6.1.3 Fit implications associated with the large bust

In this study, there were 81% participants with large busts and 60% with cup "**DD**" and above brassieres' categories. This indicates that the majority of Kenya's career women have a large bust, which implies that they are likely to experience fit problems with apparel designs that have been based on the ideal shape. According to Rasband and Liechty (2006:194), the ideal shape's bust cup is "**B**", and the participants' bust sizes (**DD**) as observed in this study were much larger than the ideal shape's size. An apparel item based on the ideal shape's cup size "**B**" would therefore contain too little fabric and curved shaping to accommodate the larger bust. This may result in wrinkles forming around the bust line between the armhole and the bust tip, or radiating from the bust tip to the armhole and the waist. The bodice side seam may bow forward, while the waistline may pull up at the centre front (Rasband, 1994:86; Rasband & Liechty, 2006:194, 198).

The bust line height positions of all the participants were below the normal position (¾ height) (**Table 5.5**). A dress made on the basis of the ideal shape's height proportions will likely fit tightly at the armhole region and the bust region, as the positions of the darts and style lines would not be in harmony with the positions of the bust lines and breasts of the wearer. It should be noted that no tolerance allowances were given above or below the standards used. If tolerance allowances were given, fewer fit problems would be predicted, as more shapes would be accommodated within the allowed tolerances.

5.6.1.4 Fit implications associated with the rounded upper back, the hollow back waist and the imbalanced back and front features

The results of this study showed that 79% and 75% of the sample of Kenyan career women had a fully rounded upper back and a deep hollow back waist, respectively. This suggests that the majority of the participants are likely to experience fit problems with ready-made apparel designed on the basis of the ideal shape. The entire back curvature would affect the fit of an apparel item if the body shape differs from the back curvature of the ideal shape.

The rounded upper back: The upper back part of the body shape curves outward more than the ideal shape does. Apparel items designed for the ideal shape will therefore have too little fabric for the length or for the curved shaping in the upper back area to contain the fullness. Consequently, the apparel may pull tight in the upper back area; diagonal wrinkles

may also form between the neck and armhole, while the waist at the centre back may pull upwards.

The hollow waist: The back curvature tapers sharply to a hollow section at the waist region – more than for the ideal shape. Apparel items meant for the ideal shape will therefore have excess fabric length and curved shaping in the lower back waist area. The apparel is therefore likely to sag, forming vertical folds just below the shoulder blades region (*Readers' Digest*, 2002:50; Rasband & Liechty, 2006:154).

Balanced postures: This refers to the alignment of the different parts of the body and the manner in which the frame is carried (Liechty *et al.*, 1992:37). A correct posture assumes a balanced alignment of all the body parts over each other and could influence the physical attractiveness of apparel items (Rasband, 1994:13). Excessively incorrect posture or non-proportional body characteristics could be termed as a figure variation as it would cause fit problems (Rasband & Liechty, 2006:29). It was observed in this study that the career women's front upper torsos (profile view) were larger than the back upper torso. This means that the side seams of the ready-made apparel are likely to pull forward to accommodate the excess fullness at the front. The lower torso from the hipline is imbalanced with all the participants' back arc being larger than the front. This implies that the apparel item's side seam is likely to pull towards the back to contain the extra width at the lower back.

5.6.1.5 Fit implications associated with the large top arm

The findings of this study demonstrated that the majority of the Kenyan career women in the sample had large top arms as identified by the visual analysis. This suggests that the majority of the career women are likely to experience fit problems with the sleeves of ready-made apparel items. The top arm muscle of these women is larger or carries more weight than the top arm of the ideal shape. This means that sleeves may not contain adequate fabric to fit comfortably and attractively around the biceps region, resulting in horizontal ripples or wrinkles forming around the upper part of the arm. The front and back armhole may pull towards the arm, while a short sleeve hemline may tend to poke out in the middle (Rasband, 1994:106-108).

5.7 CONCLUSIONS REGARDING FIT IMPLICATIONS ASSOCIATED WITH THE CURVY RECTANGULAR BODY SHAPE

Considering that ready-made apparel items are designed based on the ideal (hourglass) body shape (Loker *et al.*, 2005; Zwane & Magagula, 2006; Shin & Istook, 2007), career women in Kenya with the rectangular body shape are likely to be dissatisfied with the fit of ready-made apparel. This is because their body shapes differ not only from the Western ideal shape, but also from the Western rectangular shape. The following fit problems may be expected to be experienced by a woman with a curvy rectangular shape:

- Tight fit at the hip region, crotch line and thighs, which may lead to wrinkles and ripples forming around the affected area. The apparel item could tend to poke out at either center back or front due to the tight fit.
- Tight fit at the waistline that could lead to wrinkles on the waist region, apparel riding up, and inappropriate style and dart positions due to a waistline that is higher than normal (⅝ height) or larger than average. Apparel items such as blouses and jackets are likely to sag loosely, forming vertical folds at the back waist region due to the hollow waistline
- Tight bust line, tight armhole and tight pull in the upper back area, which could result in diagonal wrinkles forming between the neck and armhole region (bust region and shoulder blades) due to the large bust, rounded upper back and lower bust line position than the normal (¾ height) position.
- Tight upper arm could result in apparel with horizontal ripples or wrinkles forming around the upper part of the sleeve.
- The knee height position above the normal height position (¼ height) may result in pants' style lines (shaping) being inappropriately positioned, and apparel could be tight around the knee region.

Having looked at the critical fit points and scrutinised the fit implications associated with the curvy rectangular shape, it has become clear that it would be unrealistic for apparel industries to continue manufacturing styles that are suitable for the hourglass body shape (fit model), and expect to fit the curvy rectangular shape appropriately. The quality of apparel in respect of its fit can only be determined collectively, through dress forms, fit models and sizing systems, which all have to represent the target population's sizes and body shapes (Salusso-Deonier, 1989; Ashdown, Loker & Adelson, 2004; Bougourd in Ashdown, 2007:130, 133).

Data analysis and discussion of the findings based on phase two (questionnaire) data, are presented in Chapter 6.

*C*hapter 6

DATA ANALYSIS AND DISCUSSION OF THE FINDINGS BASED ON PHASE TWO DATA (QUESTIONNAIRE)

6.1 INTRODUCTION

The focus of this chapter is the statistical analyses of data, interpretation of the results and the discussion of the findings obtained from evaluating primary objectives 4, 5 and 6 of this study. In presenting the results, interpretations and discussion of the findings, this chapter attempts to direct the attention to the stated research objectives and the concomitant sub-objectives, where applicable.

6.2 DEMOGRAPHIC ANALYSIS OF THE POPULATION (Questions 1 and 2)

The analysis of the demographics of the population served as background for the examination and interpretation of the findings. The demographic information gathered from a group of career women in Kenya consisted of their ages and professional backgrounds, as presented below. These women were questioned about their perception of general fit problems with ready-made apparel, their knowledge about the communication of size (key dimensions) and fit (body shapes), and their preferences for differently fitted jackets and skirts in Kenya.

6.2.1 Age distribution (Question 1)

There were 201 respondents who completed the questionnaire. Their ages were categorised into three groups, namely: young adults aged between 25 and 32 years, a middle group aged between 33 and 40 years, and a mature group aged 41 years and above. The middle-aged (33-40) group had the highest representation (43%), while the young adult group (25-32) represented 33%. The mature (41+) group had the lowest representation (24%). The majority of the respondents were middle-aged women, and therefore likely to be more aware of the dynamics of fashion and more familiar with and critical about the fit of apparel items.

6.2.2   Career women's professional background in Home Science and/or Clothing and Textiles (Question 2)

The data on the career women's professional backgrounds in the fields of Home Science and/or Clothing and Textiles, which are thought to adequately equip individuals with skills in size and fit issues, indicates a balanced distribution between the numbers of respondents. There were 54% (n =107) with professional backgrounds in Home Science and/or Clothing and Textiles, and 46% (n = 91) without a professional background in Home Science and/or Clothing and Textiles. The assumption made here is that respondents with a professional background in Home Science and/or Clothing and Textiles would be more knowledgeable in size and fit issues and therefore more likely to experience fewer fit problems, as opposed to the respondents without a professional background in Home Science and/or Clothing and Textiles. It was also assumed that respondents without a professional background in Home Science and/or Clothing and Textiles were uninformed about size and fit issues and so more likely to encounter problems while making apparel selection in terms of styles and sizes.

6.3   ANALYSIS AND INTERPRETATION OF THE RESEARCH OBJECTIVES 4, 5 AND 6

Note: Primary objectives 1, 2 and 3 were presented and discussed in **Chapter 5**. Therefore the order of the objectives in this chapter will not necessarily be in line with their sequence in the chapter. Considering that this chapter deals with Objectives 4, 5 and 6 only, they are presented in the order in which they occur throughout this study.

6.3.1   Primary objective 4: To assess and describe career women's self-perceived fit issues with the ready-made apparel in Kenya (Questions 3, 4)

6.3.1.1 Sub-objective 4.1: To investigate career women's perception of fit with different apparel categories that are sold in various retail stores in Kenya (Question 3 and 4)
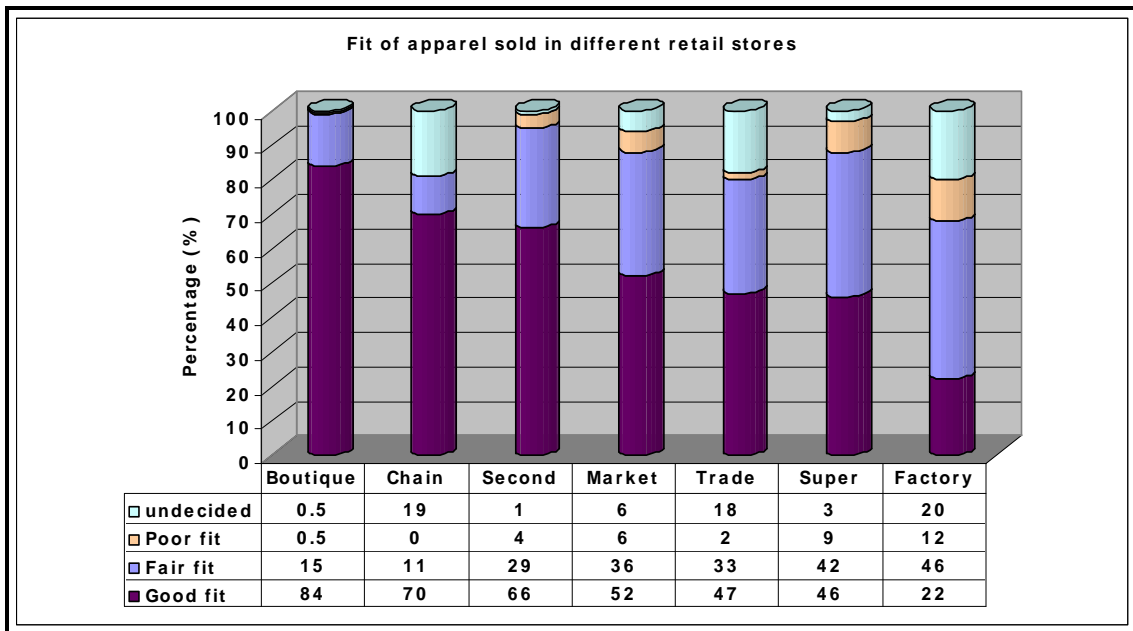
Questions 3 and 4 measured career women's perception of fit with the ready-made apparel from different sources and the ready-made apparel sold through different retail stores. The investigation was to highlight which ready-made apparel categories were perceived to have major fit problems, and to pinpoint which retail stores were perceived to sell apparel with good fit. The results analysed are presented in **Figures 6.1** and **6.2** below.

Fit quality of apparel categories

	Imported (n = 197)	Custom-made (n = 199)	Second-hand (n =194)	Local (n = 195)
◻ Good fit	78	72	65	30
◼ Fair fit	20	24	31	44
◻ Poor fit	2	4	4	26
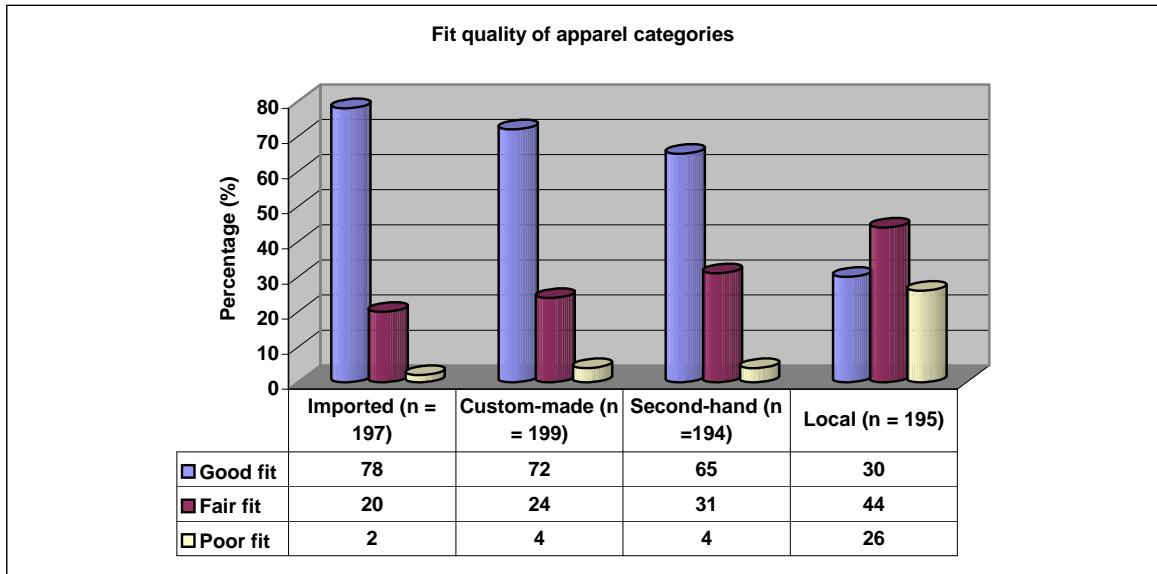
FIGURE 6.1: QUALITY OF APPAREL CATEGORIES

In **Figure 6.1** above it is clear that the imported, custom-made and second-hand apparel categories are perceived to have the best fit, as indicated by 78%, 72%, and 65% responses, respectively. Responses concerning good fit in the local ready-made apparel category counted for 30%, which is far below the imported custom-made and imported second-hand categories. On fair fit of the ready-made apparel, imported new scored 20%, custom-made 24%, imported second-hand 31%, while the majority (44%) of the respondents maintained a fair fit view on local ready-made apparel. The majority (26%) of the respondents reported that the local ready-made apparel category had poor fit, which is a sharp contrast to the imported new with a score of 2%, and the custom-made and imported second-hand with responses of 4% each. These results imply that Kenya's career women perceive imported new, custom-made and imported second-hand ready-made apparel categories as having better fit than the local ready-made apparel.

The results regarding apparel categories that are sold in various retail stores (**Figure 6.2)**, indicate that apparel sold in the boutiques, chain stores and second-hand stores had good fit, as reflected by 84%, 70% and 66% responses respectively. Apparel sold in market stalls recorded responses of 52%, trade fairs 47%, supermarkets 46%, and factory outlets with the lowest 22%. Regarding fair fit, factory outlets and supermarkets scored 46% and 42% responses, respectively, while market stalls recorded 36%, trade fairs 33% and second-hand stores 29%. Boutiques and chain stores had responses of 15% and 11% respectively.

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Fit of apparel sold in different retail stores

	Boutique	Chain	Second	Market	Trade	Super	Factory
□ undecided	0.5	19	1	6	18	3	20
□ Poor fit	0.5	0	4	6	2	9	12
□ Fair fit	15	11	29	36	33	42	46
■ Good fit	84	70	66	52	47	46	22

Boutiques (n = 196), Chain = Chain stores (n = 180), Second = Second-hand stores (n = 193), Market = Market stalls (n = 190), Trade = Trade fairs (n = 184), Super = Supermarkets (n = 198), Factory = Factory outlets (n = 173)

FIGURE 6.2: FIT QUALITY OF READY-MADE APPAREL SOLD AT DIFFERENT RETAIL STORES

As for poor fit, **Figure 6.2** further show that factory outlets had 12%, supermarkets 9%, and the rest of the retail stores had responses of between 2% and 6% each. The inference is that, according to Kenya's career women, factory outlets sell ready-made apparel with poor fit, while boutiques, chain stores and second-hand stores sell apparel items with good fit.

6.3.1.2 Sub-objective 4.2: To describe fit problems that career women in Kenya encounter regarding the specific critical fit points of different parts of their bodies (Question 22)

Question 22 solicited career women's responses on how they experience fit problems at their critical fit points. For the purposes of data management and presentation, the body was split into the upper and the lower torso and the arms. **Tables 6.1**, **6.2** and **6.3** present the fit problems encountered at the upper and lower torso and the arms.

Form **Table 6.1,** it is clear that Kenya's career women experienced fit problems (too tight or too loose) – as indicated by percentage responses that range from 58% to 65% – on all the critical fit points of the upper torso. Regarding problems of tight fit, the bust region had the highest number of reports, with 37% of the responses. As far as problems of loose fit are

concerned, the neckline region had the highest number of responses (43%). For the problems of length, the highest (41%) number of responses were reports of normal/acceptable fit.

TABLE 6.1:   FIT PROBLEMS ENCOUNTERED AT THE UPPER PART OF THE TORSO

Fit Point	Fit problem		Frequency	Percentage	
Neckline	Tight	Fit problems	29	15	58
	Loose		87	43	
	Normal/acceptable		85	42	
Shoulders	Tight	Fit problems	50	25	60
	Loose		71	35	
	Normal/acceptable		80	40	
Back width	Tight	Fit problems	53	27	61
	Loose		69	34	
	Normal/acceptable		79	39	
Bust	Tight	Fit problems	75	37	65
	Loose		56	28	
	Normal/acceptable		70	35	
Bodice back, nape to waist	Short	Fit problems	64	32	59
	Long		54	27	
	Normal/acceptable		83	41	
Bodice front, neck to waist	Short	Fit problems	60	30	59
	Long		58	29	
	Normal/acceptable		83	41	

The inference that may be drawn from the results presented in **Table 6.1**, here is that most Kenyan career women experienced fit problems with the widths of ready-made apparel, that were reported as either too tight or too loose. On average, 61% of the Kenyan career women reported problems with fit, which is more than the 39% that reported acceptable fit. However, loose fit problems reported at the upper torso particularly around the back width, shoulders and neckline, indicate that most of the participants' upper body's characteristics deviate from what the industry use as a base pattern. This confirms the critical fit points of the curvy rectangular body shape's upper torso observed in **Chapter 5** (**paragraph 5.6**). Common body characteristics that could accelerate fit problems within the upper torso of the curvy rectangular shape include the rounded upper back, the large bust, and the large and high stomach that is positioned above the ideal figure's normal waist position.

The lower torso's critical fit points (**Table 6.2**) were more prominent than those of the upper torso. This could have contributed to fewer respondents (26%) reporting problems with tight fit than those (35%) reporting problems of loose fit with the upper torso's critical fit points. As in the case of the stated width fit problems, it is also obvious that more Kenyan career

women (59%) encountered problems with length (too short or too long), than those who felt that the lengths were acceptable (fine). As observed in **Chapter 5** (**paragraph 5.2**), the majority of the respondents (74%) were in the medium height category, and the majority (84%) had waist lines positioned higher than the ideal figure's normal waist position ($\frac{5}{8}$ height) (**Table 5.5**). These could have contributed to the more (41%) responses of acceptable length than the reported shorter (31%) or longer (28%) length fitting problems.

TABLE 6.2:   FIT PROBLEMS ENCOUNTERED AT THE LOWER TORSO

Fit Point	Fit problem		Frequency	Percentage	
Waist	Tight	Fit problems	60	30	74
	Loose		89	44	
	Normal/acceptable		52	26	
Stomach	Tight	Fit problems	87	43	66
	Loose		46	23	
	Normal/acceptable		68	34	
Hip	Tight	Fit problems	109	54	79
	Loose		49	25	
	Normal/acceptable		43	21	
Crotch	Tight	Fit problems	78	39	60
	Loose		42	21	
	Normal/acceptable		81	40	
Buttocks	Tight	Fit problems	86	43	67
	Loose		49	24	
	Normal/acceptable		66	33	
Thighs	Tight	Fit problems	87	43	66
	Loose		46	23	
	Normal/acceptable		68	34	
Skirt length	Short	Fit problems	60	30	61
	Long		62	31	
	Normal/acceptable		79	39	
Pants Length	Short	Fit problems	55	28	63
	Long		71	35	
	Normal/acceptable		75	37	

In **Table 6.2** above it is clear that Kenyan career women experience more (67%) fit problems (tight or loose fit) on average, at the lower torso, than acceptable fit (33%). As for problems with tight fit at the lower torso, the hip region had the highest number of responses (54%), followed by the stomach and thigh regions, with equal (43%) responses each. The waist region scored the highest (44%) number of responses for problems with loose fit. For length problems, there were almost equal representations on the reported longer skirts and pants' lengths (31% and 35%) and the reported shorter skirts and pants' lengths (30% and 28%), which may imply that Kenya's career women experienced fewer fit problems with length.

As in the case of the upper torso, it is also clear that more (69%) Kenyan career women experience fit problems at their lower torsos' critical fit points than are satisfied with a normal or acceptable fit (31%). It is further confirmed that Kenyan career women experience more (69%) fit problems with the lower torso's critical fit points than (61%) they experience at the upper torso. However, among the reported fit problems, generally Kenyan career women experienced more tight fit problems with the lower torso (42%) than with their upper torso (26%). These results confirm the critical fit points of the curvy rectangular body shape's lower torso that were observed in **Chapter 5** (**paragraph 5.6**). Common body characteristics that could accelerate fit problems within the lower torso region of the curvy rectangular shape include the large buttocks, the large thighs and the large stomach that is positioned above the ideal figure's normal waist position. These characteristics were more prominent than the upper torso's characteristics, which may further confirm the more tight fit problems reported at the lower torso than at the upper torso.

It is also apparent that there were more (62%) length problems experienced with the lower torso than the reported acceptable lengths (38%). However, there were almost equal representations on the reported short (30%), longer (31%) and acceptable (38%) skirts' and pants' lengths, which may confirm that the majority of the respondents (**Table 5.2**) were in the medium height category and therefore they were likely to experience fewer length problems. Length is also dictated by fashion trends, and thus length preference could vary with different consumers.

TABLE 6.3:   FIT PROBLEMS ENCOUNTERED AT THE ARMS

Fit Point	Fit problem		Frequency	Percentage	
Armscye (armhole)	Tight	Fit problems	67	33	61
	Loose		57	28	
	Normal/acceptable		77	39	
Upper arm	Tight	Fit problems	83	41	66
	Loose		50	25	
	Normal/acceptable		68	34	
Elbow	Tight	Fit problems	61	30	54
	Loose		49	24	
	Normal/acceptable		91	46	
Below elbow	Tight	Fit problems	44	22	52
	Loose		61	30	
	Normal/acceptable		96	48	
Sleeve length	Short	Fit problems	65	32	61
	Long		59	29	
	Normal/acceptable		77	39	

In **Table 6.3** it is evident that more Kenyan career women (59%), on average, experience problems (tight or loose) with the arms' critical fit points than those who do not experience fit problems (41%). However, 41% of the Kenyan career women reported experiencing problems of tight fit at their upper arm, which confirms the findings observed in **Chapter 5** (**Table 5.13**) that the majority (59%) of the respondents had full/large biceps regions. The Kenyan career women also reported experiencing more (61%) problems with the length of sleeves than those who expressed satisfaction with acceptable length (39%). This could possibly be attributed to pattern grading processes in the apparel industry, which assume that the larger the size, the longer the sleeves (Loker *et al.*, 2005; Schofield in Ashdown, 2007:180-188).

6.3.1.3 Sub-objective 4.3: To describe career women's degree of satisfaction with the process of finding appropriate ready-made apparel items in Kenya (Question 21)

Question 21 was used to determine consumers' satisfaction with the process of finding apparel that fit well, in terms of the search process, the availability of suitable styles and appropriate sizes, and the availability of fashionable apparel items in appropriate sizes and styles for the consumers' body sizes and shapes. The results are presented in **Figure 6.3**.

Consumers' satisfaction with the ready-made apparel (n = 200)

	Problems getting right sizes	Satisfied with fit	Latest fashion available
Frequent	56	36	26
Less frequent	35	57	50
Never	7.5	6	21
Undecided	1.5	1	3
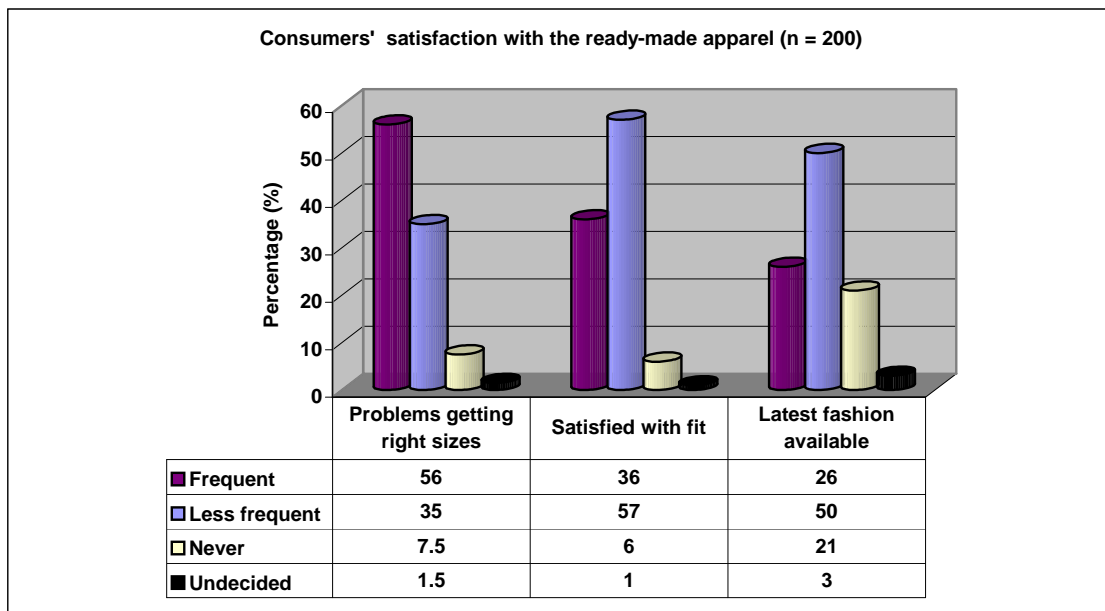
FIGURE 6.3: **CAREER WOMEN'S SATISFACTION WITH THE PROCESS OF FINDING APPROPRIATE READY-MADE APPAREL**

The results (**Figure 6.3**) indicate that 91% (56% - frequent + 35% - less frequently)

respondents experienced problems getting the right sizes and styles that fit their shapes and sizes appropriately. Respondents who reported that the latest fashions were less frequently available in their sizes were 71% (50% - less frequently available + 21% - never available). Respondents who were less satisfied with the way most ready-made apparel fit their sizes and their body shapes were 63% (57% - less frequently satisfied + 6% - never satisfied). This implies that Kenyan career women were not satisfied with the fit and availability of the latest fashions. Their dissatisfaction with the fit of ready-made apparel was confirmed by 65% (on average) reporting fit problems experienced at their bodies' critical fit points (**Tables 6.1** and **6.2**). The fit implications associated with the distinct curvy rectangular shape of the Kenyan career women such as tight fit around the hipline, bust line and stomach region (**Chapter 5** (**paragraph 5.5** and **5.6**), may also confirm career women's dissatisfaction with the fit of ready-made apparel.

6.3.1.4 Sub-objective 4.4: To explore career women's self-perceived sources of fit problems with apparel in Kenya (Question 20)

Question 20 asked whether the career women felt that the apparel industry or their body shapes were the sources of the fit problems they encountered. The results are presented in **Figure 6.4** below.

Perceived source of fit problems	Apparel industry (n=199)	Own body shape (n=200)
Agree	89	78
Disagree	10	22
Undecided	1	0
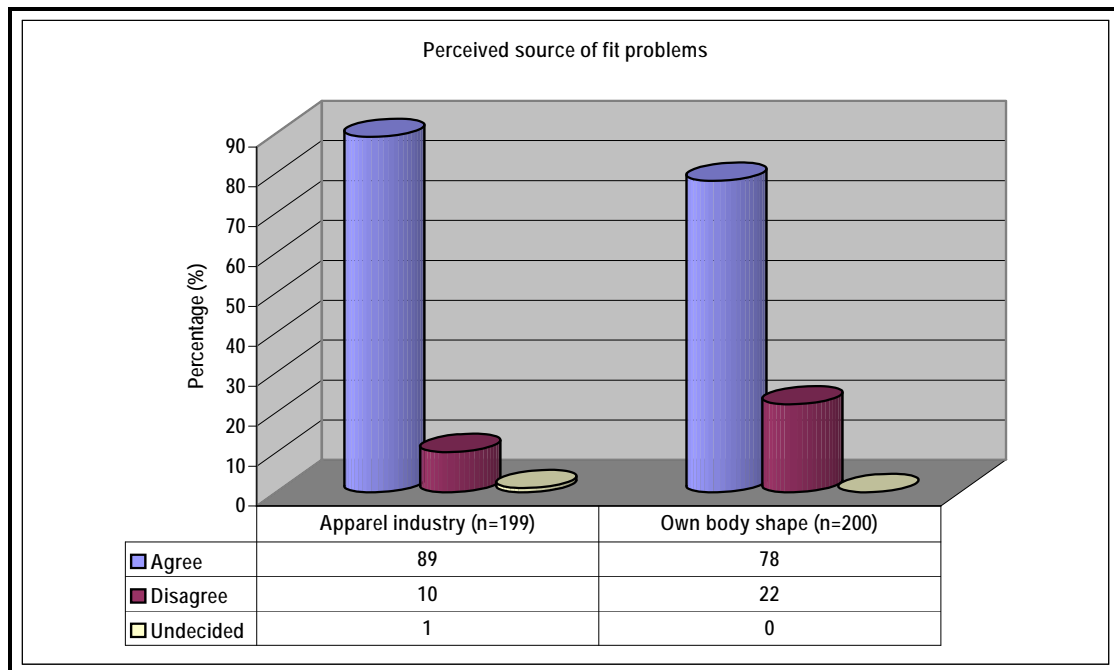
FIGURE 6.4: CAREER WOMEN'S PERCEIVED SOURCES OF FIT PROBLEMS

As **Figure 6.4** shows, respondents chose both the options of the apparel industry and own body shapes as sources of fit problems. Eighty nine per cent identified the apparel industry, and 78% identified their own body shapes as the source of fit problems. Statistically, there were significant (0.002 < 0.05) associations between body shape and the apparel industry as perceived sources of fit problems. This may suggest a possibility that career women in Kenya were confused regarding the sources of the fit problems they were experiencing with apparel.

6.3.2 Primary objective 5: To determine and describe Kenyan career women's knowledge about the communication of size (key body dimensions) and fit (body shapes)

6.3.2.1 Sub-Objective 5.1: To explore Kenyan career women's knowledge about the communication of size (Question 6, 13, 14, 15, 16, 17 and 18)

Familiarity with and perceived effectiveness of the size labels: Question 15 was used to determine from the career women's viewpoints, which size labels (size description systems) among the provided types, were familiar to them, while question 18 attempted to ascertain career women's perceptions regarding the effectiveness of size labels. The results in this regard are presented in **Figure 6.5**.

Size label's familiarity and effectiveness (n = 201)

	XL	8 to 24	32 to 50	Code +	Pict +	Wordless
■ Familiar label	98	98.5	95	35	7	3
■ Non-familiar	2	1.5	5	65	93	97
■ Effective labels	49	60	44	99	99	98
□ Ineffective labels	51	40	56	1	1	2
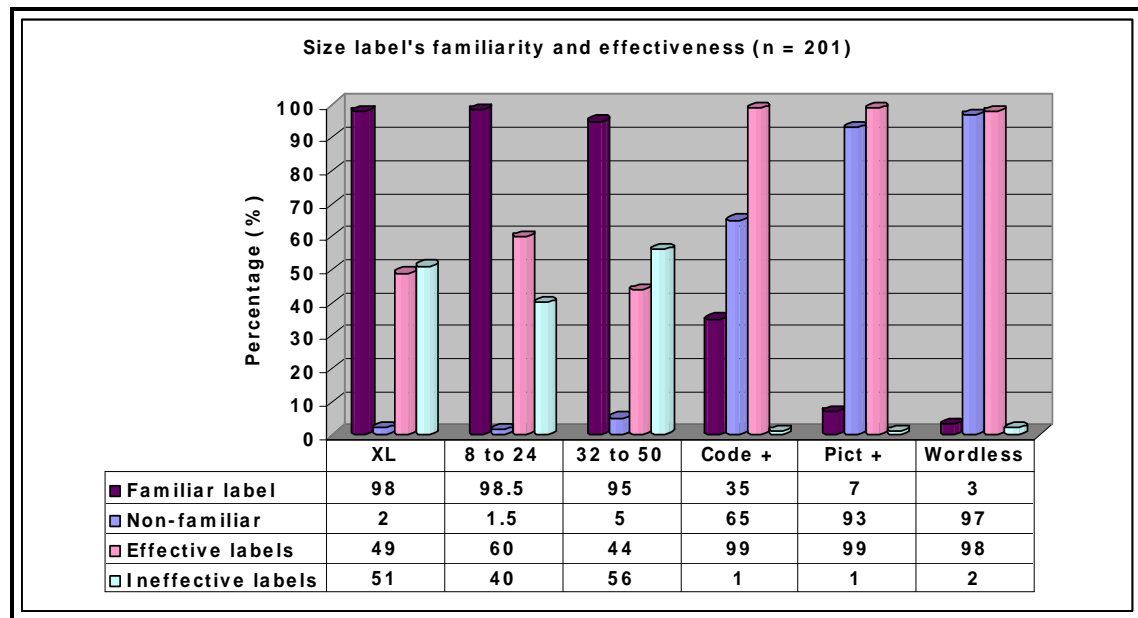
XL = Extra large lettered label, 8 to 20 = Numbered size codes, 32 to 50 = Numbered (inches) size codes, Code + = Numbered size code and key dimensions, Pict + = Pictogram and key dimensions, Wordless = wordless pictogram (illustrated body shape)

FIGURE 6.5: FAMILIARITY WITH AND PERCEIVED EFFECTIVENESS OF SIZE LABELS

It is clear from **Figure 6.5** that informative size labels, which comprise a code and measurements, pictogram and measurements, or the wordless pictogram, were less familiar size labels to the Kenyan career women, as indicated by 35%, 7% and 3% responses respectively. However, these informative labels scored 98.5% on average, as effective size labels. As for the uninformative size labels, comprising numbered (8-24), lettered (S-XL) and numbered (32-50) labels, they were the most familiar size labels, with 98.5%, 98% and 95% responses respectively. The uninformative labels on average were ranked as effective by only 51% responses, which is far lower than the responses on informative size labels.

It appears from the results that familiarity with and perceived effectiveness of size labels are two separate issues that seem to have no association with each other. There were no significant (0.21 > 0.05) associations between the women's familiarity with size label terms and their knowledge in this regard. This possibly suggests that their familiarity with size labels did not guarantee appropriate and informed apparel selection, as the size labels' meanings were not understood by the consumers.

Career women's knowledge about size labels: Questions 16 and 17 were used to examine the career women's knowledge about the size labels used on women's ready-made apparel. Respondents were supposed to give a correct interpretation of a given size in terms of the key dimension it represents in a given apparel item. The results are presented in **Figure 6.6**.

Consumers' knowledge on the meaning of size labels (n = 201)

	Jackt size 16	Jackt size 42	Jackt size XL	Pant size 16	Pant size 42	Pant size XL	Skirt size 16	Skirt size 42
Answered incorrectly	86.5	76.5	75	75	72	76	77	77
Answered correctly	13.5	23.5	25	25	28	24	23	23
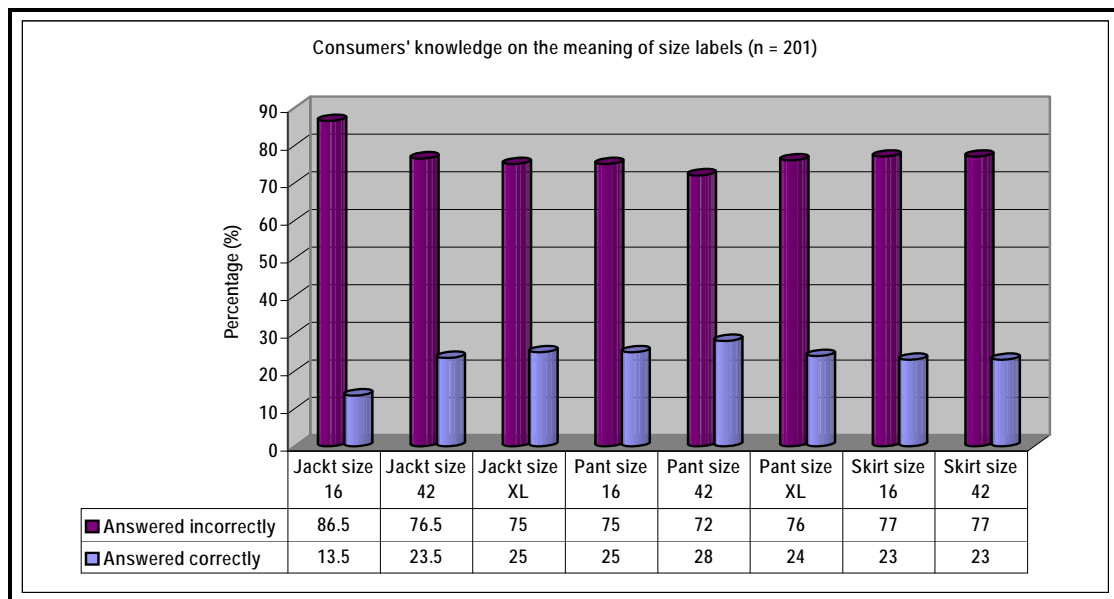
Jacket = Jacket

FIGURE 6.6:   CAREER WOMEN'S KNOWLEDGE ABOUT SIZE LABELS

The results show that the majority of the respondents described the different size labels that are used on jackets, pants and skirts, incorrectly. The scores on incorrect descriptions of the different labels ranged from 72% to 86.5%, while scores on correct description of the size labels ranged from 13.5% to 28%, which is a sharp contrast. An average of 77% respondents described different size labels incorrectly. This suggests that Kenya's career women lack knowledge about the meaning of size labels.

It was assumed that the older the consumers become, the more experienced and knowledgeable they become, in terms of size labels and appropriate apparel selection. Apparently, there was no significant (0.21 > 0.05) association between the different age groups of the respondents and their knowledge about size labels. It is also likely that consumers' long experience with size labels does not necessarily guarantee certain knowledge about size labels. Ignorant consumers end up getting frustrated and confused as they flip through several assortments of styles and sizes in a retail environment without any guiding base, as they do not understand the meaning of the size codes presented to them.

Comparisons were made on the interpretation of the size codes on the size labels between professionals in Home Science/Clothing and the non-professionals, to establish whether their level of knowledge differed in this regard. There were significant (0.0136 < 0.05) associations between the knowledge of the professionals in Home Sciences and the size labels' contents. The professional Home Scientists scored higher on correct descriptions of size codes and size labels' contents than the non-professionals in Home Science. It seems therefore that formal information on size and fit can equip learners with knowledge regarding the sizing of apparel.

Career women's knowledge on their key dimensions: Question 6 asked the respondents for their key dimensions of bust, waist and hip, and these were compared with the actual measurements (obtained from them). The aim was to establish whether the career women were informed about their key dimensions, which are so necessary for identifying correct sizes. The results are presented in **Figures 6.7**, **6.8** and **6.9**.

Figure 6.7 indicates a generally linear relationship between the bust dimensions reported and those measured. However, there are outlying individuals outside the general trend. This illustrates that the reported bust dimensions had a moderate relationship with the obtained bust dimension as indicated by the coefficient of correlation (r = 0.55). Statistically, this relationship was significant (0.0001< 0.05).

Actual bust dimensions versus reported bust dimensions
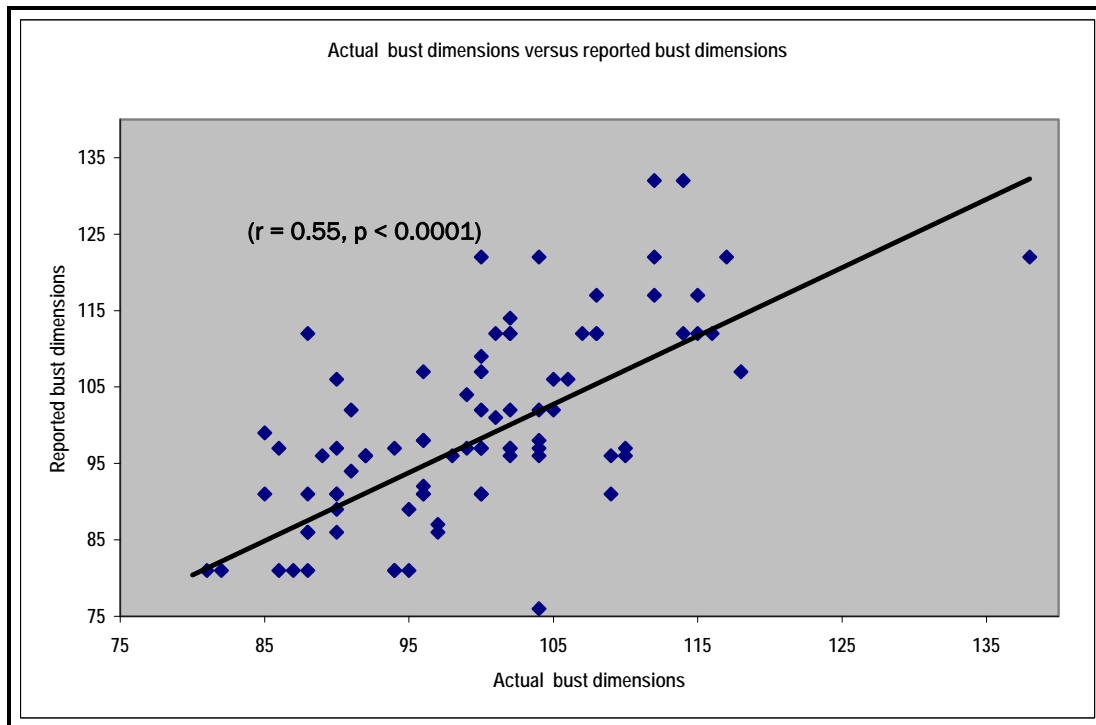
FIGURE 6.7: SCATTER PLOT COMPARING REPORTED BUST DIMENSIONS WITH OBTAINED BUST DIMENSIONS

The nature of the relationship shown in **Figure 6.7** show that there were a few respondents who accurately reported their bust dimensions; therefore one could say that Kenya's career women were partially knowledgeable about their bust dimensions.

Figure 6.8 clearly shows that there is a generally linear relationship between the reported waist dimension and the actual waist dimension. However, there are more outlying individuals in this instance. The career women's reported waist measurement and their actual waist dimension indicated a partial relationship (r = 0.52). Statistically, there was a significant (0.0001 < 0.05) relationship between the reported waist dimensions and the actual waist dimensions – suggesting that the career women were also moderately knowledgeable about their waist dimensions, as for their bust dimensions.

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Reported waist dimensions versus actual waist dimensions (n = 123)

(r = 0.52, p > 0.0001)

Reported wiast dimensions (y-axis)

Actual waist dimensions (x-axis)
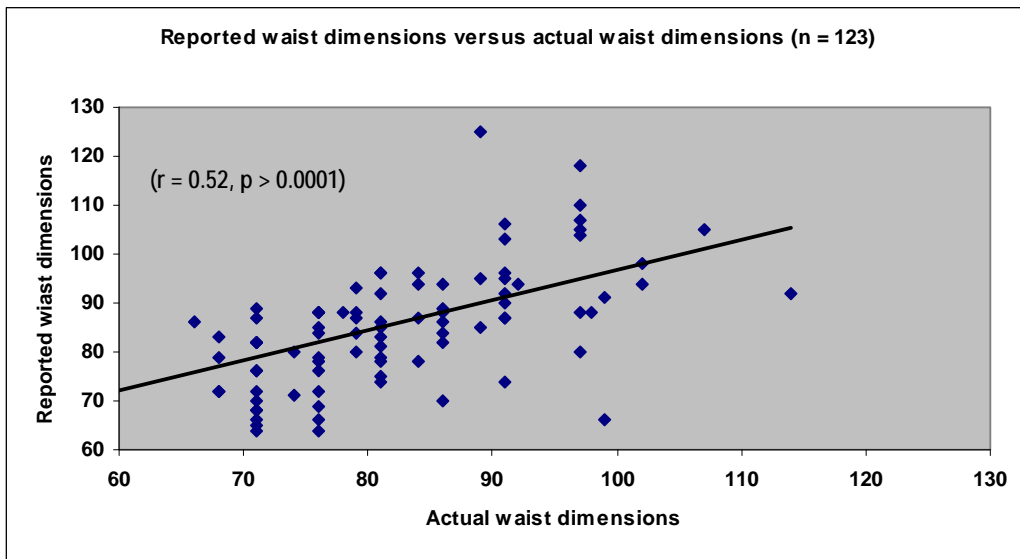
FIGURE 6.8: SCATTER PLOT COMPARING REPORTED WAIST DIMENSIONS AND OBTAINED WAIST DIMENSIONS

Reported hip dimensions versus measured hip dimensions (n = 123)

(r = 0.53, p > O.001)

Reported hip dimensions (y-axis)

Actual hip dimensions (x-axis)
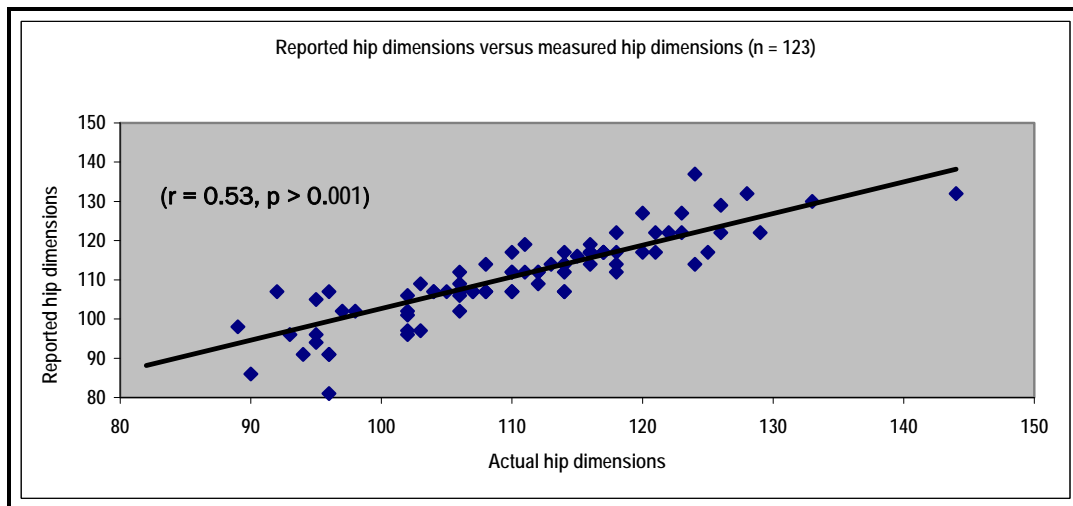
FIGURE 6.9: SCATTER PLOT COMPARING REPORTED HIP DIMENSIONS WITH OBTAINED HIP DIMENSIONS

Figure 6.9 above indicates a generally linear relationship between the reported and the measured hip dimensions. However, there are a few outlying individuals outside the general trend. This illustrates that the reported hip dimensions had a strong relationship with the obtained hip dimension, as indicated by the coefficient of correlation (r = 0.68). Statistically, there was a significant (0.0001 < 0.05) relationship between the reported hip dimension and the actual (obtained) hip dimension. The majority of the career women reported their hip

dimensions more accurately than their bust and waist dimensions; hence they were more knowledgeable about their hip measurements.

Career women's knowledge about their sizes: Questions 13 and 14 solicited responses concerning career women's own sizes, expressed in even numbers 8 to 24 and 32 to 50, respectively. The actual key dimensions of the bust, the waist and the hips obtained from respondents were used to compare with their reported sizes (bust and hips). The reported sizes were converted to bust, waist and hip measurements according to Kenyan size standards (**Appendix 4A**), to facilitate comparisons with the corresponding actual body dimensions for the reported sizes. For the purposes of brevity, examples of visual representation of correlations between reported sizes in designations of even numbers (8 to 24) and in designations of even numbers (32 to 50) are presented in **Figures 6.10** and **6.11**.

Reported jacket sizes versus actual bust dimensions in sizes designation (12 -24) (n = 123)

(r = 0.68, p < 0.0001)
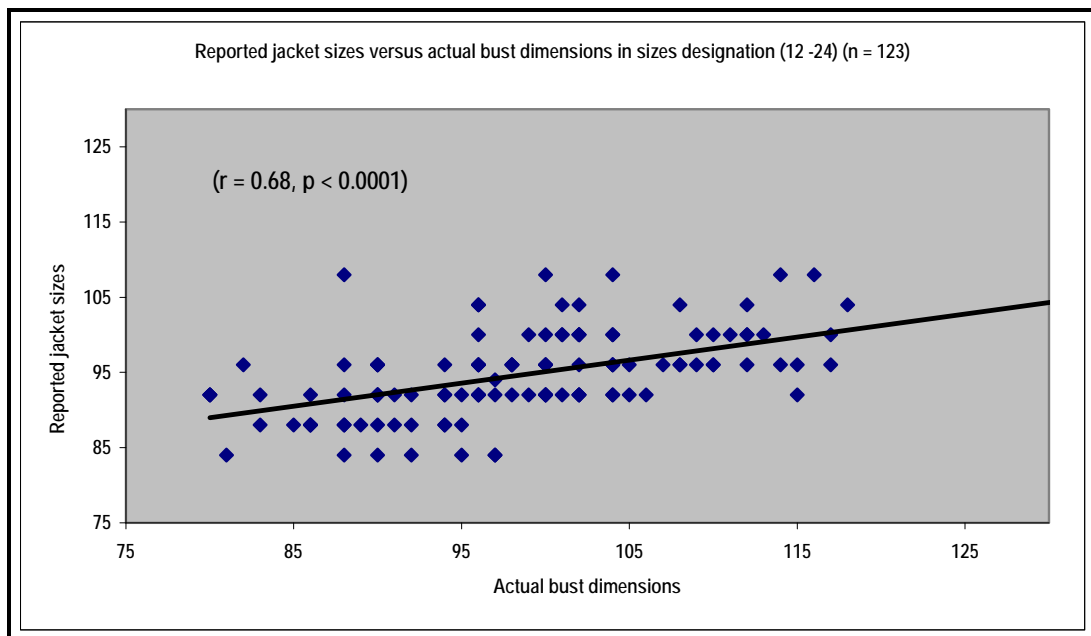
FIGURE 6.10: SCATTER PLOT COMPARING REPORTED JACKET SIZES (BUST) WITH THE OBTAINED BUST DIMENSIONS IN SIZE DESIGNATION OF 12 TO 24

Figure 6.10 shows a generally linear relationship between reported jacket sizes and the measured (actual) bust dimensions, although there are some outlying individuals outside the general trend. This illustrates that the reported jacket size had a moderate relationship with the obtained bust dimension, as indicated by the coefficient of correlation (r = 0.53). Statistically, there was a significant (0.0001 < 0.05) relationship between the reported jacket sizes and the obtained bust dimensions. As in the case of the reported jacket sizes in size designation of even numbers (12-24), the other reported apparel sizes maintained a similar pattern of linear relationship with some outlying individuals outside the general trend line

(**Figure 6.10**). There were moderate relationships between the reported apparel sizes and the obtained (actual) dimensions of bust and hip: reported dress sizes (bust) (r = 0.51, p > 0.001), reported skirt size (hip) (r = 0.58, p > 0.0001), and the reported trousers size (hip) (r = 0.56, p > 0.0001). Statistically, the relationships were significant (p < 0.005). The inference that can be drawn is that Kenya's career women were moderately knowledgeable about their sizes, designated in even numbers 12 to 24.

An example of the visual representation of the correlations between the reported sizes in designations of even numbers (32 to 50) is presented in **Figure 6.11**.

Reported jacket sizes versus obtained bust dimensins in sizes designation (32-50)

(r = 0.32, p > 0.0033)
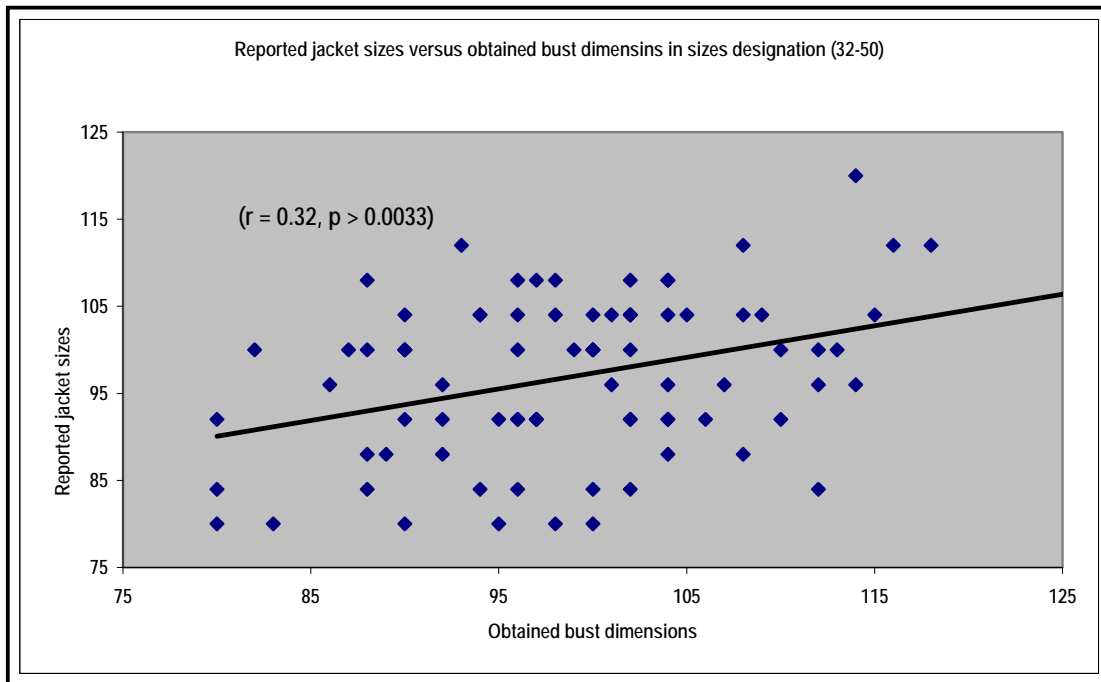
FIGURE 6.11: SCATTER PLOT COMPARING REPORTED JACKET SIZES (BUST) WITH THE OBTAINED BUST DIMENSIONS IN SIZE DESIGNATION OF 32 TO 50

Figure 6.11 demonstrates that, although there is a generally linear relationship between reported the jacket sizes and the measured (actual) bust dimensions, there are more outlying individuals outside the general trend. This illustrates that the reported jacket size had a poor relationship with the obtained bust dimension, as indicated by the coefficient of correlation (r = 0.32). Statistically, there was a significant (0.0033 < 0.05) relationship between the reported jacket size and the obtained bust dimensions. As in the case of the reported jacket in size designation of even numbers (32-50), all the other reported apparel sizes had similarly poor relationships between the reported apparel size (bust or hip) and the obtained dimensions (bust or hip): reported dress sizes (bust) (r = 0.32, p > 0.0041), reported skirt size

(hip) (r = 0.44, p > .0001), and the reported trousers size (hip) (r = 0.45, p > 0.001). Statistically, there were significant relationships between the reported sizes and the obtained measurements. It appears that Kenya's career women were moderately knowledgeable about their sizes designated with even numbers 12 to 24, but were poorly knowledgeable about their sizes designated with even numbers 32 to 50.

6.3.2.2 Sub-objective 5.2: To explore Kenyan career women's knowledge about the communication of fit (Questions 5, 7, 8, 9, 10, 11 and 12)

The meaning of the terms used on size labels to represent established body shapes has been explained in **chapter 3 (paragraph 3.2.2.1)**. Question 5 had two sections. Section one was used to determine whether the career women were familiar with the terms used on size labels to represent established body shapes, while the second section was to examine whether the respondents understood the meaning of those terms. Answers were accepted as correct based on a brief description of the height, approximate age and body width characteristics according to the literature (**Chapter 3** (**paragraph 3.2.2.1**)). The results on both the respondents' familiarity with and their knowledge about the terms used on size labels are presented in **Figures 6.12**.

Carrer women's familiarity with and knowledge about terms used to represent body shapes (n = 201)

	Women's-petite	Misses	Misses-petite	Women's	Junior
■ Unfamiliar terms	79	76	73	61	56
□ Familiar terms	29	24	27	39	44
■ Incorrectly described	97	99	97	96	100
□ Correctly described	3	1	3	4	0
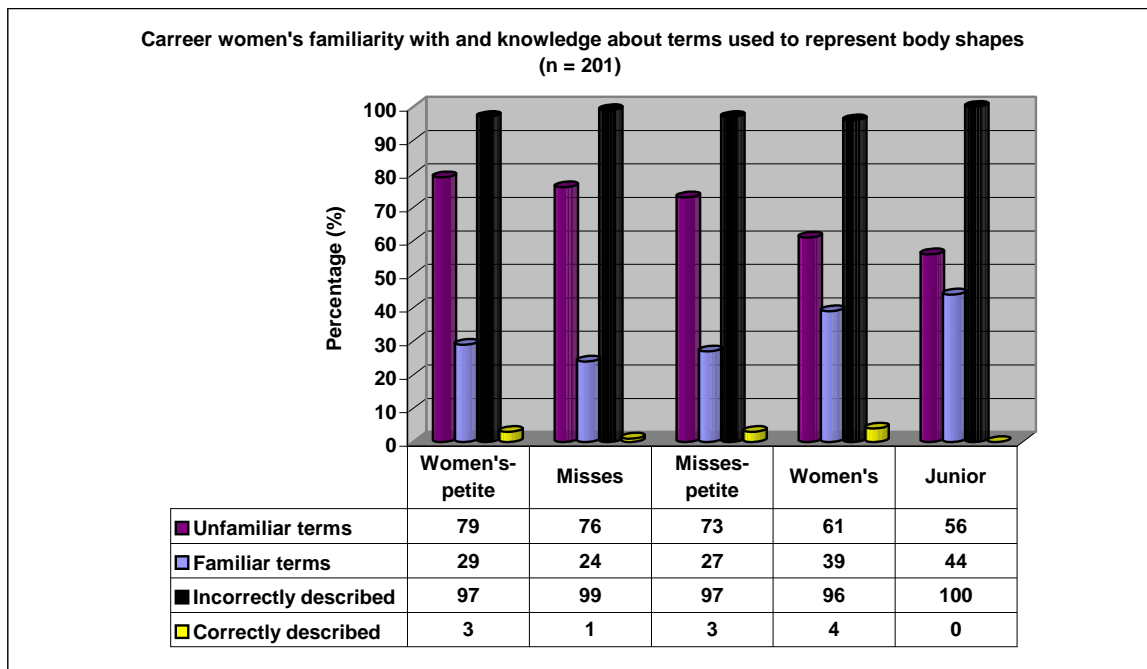
FIGURE 6.12: CAREER WOMEN'S FAMILIARITY WITH AND KNOWLEDGE ABOUT TERMS THAT REPRESENT BODY/FIGURE SHAPES

Regarding the respondents' familiarity with the terms that represent body shapes, the results

show that women's-petites, misses and misses-petites were reported as unfamiliar by 79%, 76% and 73% responses, respectively, while women's and junior labels were reported as unfamiliar by 61% and 56% respondents, respectively. On average, all the terms were reported as unfamiliar by 69% responses, which is in sharp contrast to the terms reported as familiar (31%). Therefore, this suggests that terms used on size labels to indicate different body shapes were less familiar to Kenya's career women.

As for the respondents' knowledge about the terms that represent body shapes (**Figure 6.12**), it is clear that 100% and 99% of the respondents, respectively, described junior and misses labels incorrectly. Misses-petites and women's petites were each incorrectly described by 97% of the respondents, while 96% respondents incorrectly described the women's label. On average, 98% respondents incorrectly described all the terms, suggesting a high level of ignorance/lack of knowledge about body shape terms represented on size labels. There was a statistically significant (0.0001 < 0.05) association between consumers' familiarity with the size label terms (representing body shapes) and their knowledge. The nature of the association was that consumers scored higher on the familiar terms than on the unfamiliar terms. There was no statistically significant (0.63 > 0.05) association between their familiarity with size label terms and a professional background in Home Science/Clothing and Textiles, but statistically significant (0.02 < 0.05) associations were found between their knowledge and their professional background. Respondents with a Home Science/Clothing and Textiles professional background had higher scores on description of some familiar terms than those without such a professional background. The deduction could be made that a professional background in Home Science/Clothing and Textiles could possibly influence consumers' knowledge about the terms used on size labels to represent body shapes.

It was assumed that older career women would be more knowledgeable about body shape terms than the younger women. There was no statistically significant (0.42 > 0.05) association between career women's age and their knowledge about size label terms used to describe body shapes. This may suggest that the longer experience of the older group does not guarantee knowledge about the size label terms.

Career women's knowledge about illustrated body shapes: Question 8 was used to determine whether the career women could physically identify and describe the different illustrated figures within the five prevalent established body types (Triangle, Inverted triangle, Apple, Rectangle and Hourglass). **Figure 6.13** below presents the results.

Consumers knowledge about illustrated body shapes (n = 201)

	Pear	Barrel	Apple	Rectangle	Hourglass
■ Incorrect description	67	67	65	59	50
□ Correct description	33	33	35	41	50
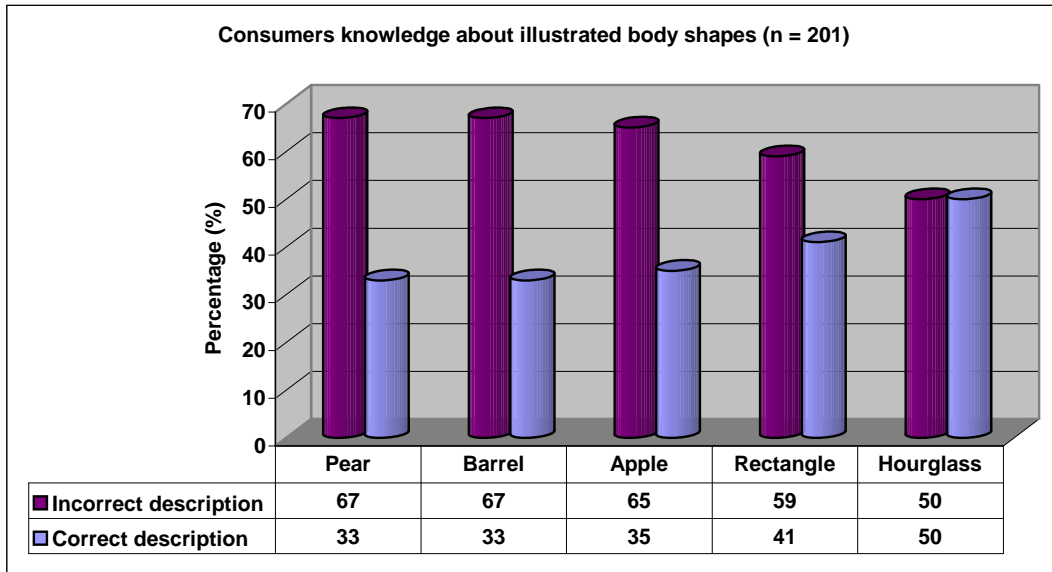
FIGURE 6.13: CAREER WOMEN'S DESCRIPTION OF THE PREVALENT ILLUSTRATED BODY SHAPES

Figure 6.13 shows that the pear and barrel body shapes were both incorrectly described by 67% of the respondents, while 65%, 59% and 50% of the respondents respectively, described the apple, rectangle and hourglass body shapes incorrectly. On average, the majority (62%) of the respondents described all the body shapes incorrectly. As in the case of size label terms that represent body shapes (**Figure 6.13**), Kenyan career women were also ignorant of the five prevalent body shapes.

Career women's knowledge about their own body shapes: Question 7 was used to determine whether the career women's self-reported own body shapes were the true representation of their body shapes. Illustrations of different figures were presented for them to select one that they felt was an approximate representation of their own body shapes. To authenticate their knowledge, the self-reported body shapes were compared with their actual figure types that emerged from the measurements and photographs.

The results presented in **Figure 6.14** indicate that respondents with a rectangular body shape were 74%, while only 14% of the respondents reported the rectangle body shape as their own. From the measurements, there were 21.5% Triangular body shapes, but 24% of the respondents self-reported the pear body shape as their own. Respondents with apple, hourglass and inverted triangular body shapes from the body measurements were least represented (1.5%).

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Body shape from measurements versus self-reported body shape

	Rectangle	Triangle	Apple	Hourglass	Inverted triangle
☐ Body shape from the measurements (n = 123)	74	21.5	1.5	1.5	1.5
◼ Participants' self-reported body shape (n = 183)	14	24	16	37	9
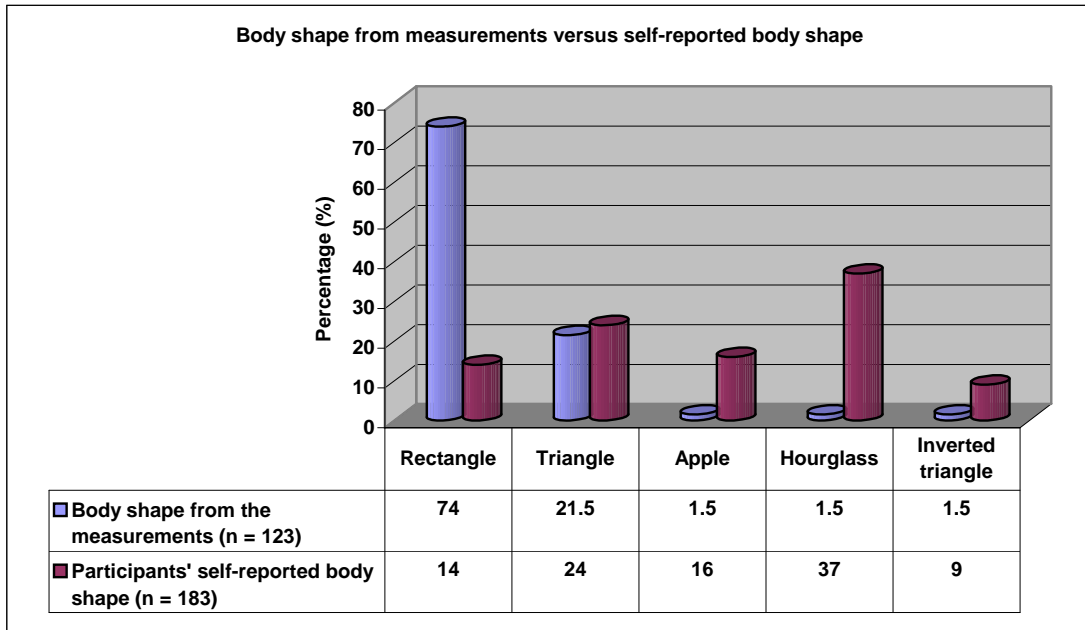
FIGURE 6.14: CAREER WOMEN'S SELF-REPORTED BODY SHAPE VERSUS THEIR ACTUAL FIGURES FROM MEASUREMENTS

From **Table 6.14**, it also shows that 37% of the respondents self-reported the hourglass body shape as their own, which is a higher percentage than the other self-reported shapes, which scored between 9% and 24%. Again, it is clear that the Kenyan career women were not only uninformed about the different body shapes (**Figures 6.12** and **6.13**), but were also uninformed and unrealistic about their own body shapes. The majority of them gave the impression that they perceive their shapes as the hourglass body shape.

Career women's application of body shape assessment techniques: Question 9 was used to further explore whether the consumers' knowledge about their own figures had been enhanced by self-evaluative techniques learnt through reading, observing or any other medium.

Shown in Figure 6.15 the results depicts that, except for the use of a mirror (64%) and the key dimensions (50%) as reported body shape assessment techniques applied by the respondents, all the rest of the techniques were least applied by the majority of the respondents. On average, 74% of the respondents did not apply self-evaluation techniques to determine their body shape.

Body shape assessment techniques applied by career women (n = 198)

	Trace	Told	Yard	Photos	Comp	Measure	Mirror
■ Not applied	94	94	94	94	76	50	36
■ Applied	6	6	6	6	24	50	64
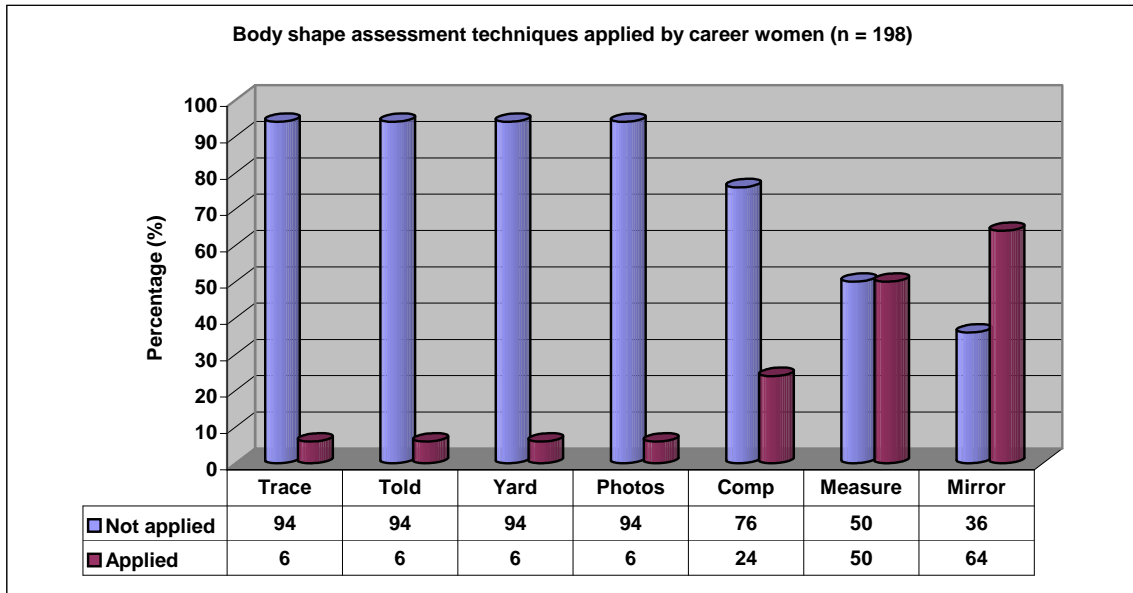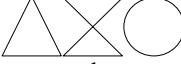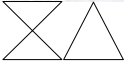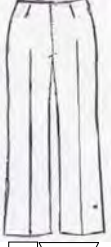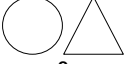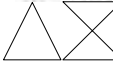
Trace = Tracing body outline against the wall, Told = told by friends, Yard = use of yardstick, photos = use of photographs, Comp = Comparing with established illustrations, Measure = use of key body dimensions, and Mirror = use of mirror in minimal apparel

FIGURE 6.15: BODY SHAPE ASSESSMENT TECHNIQUES APPLIED BY KENYAN CAREER WOMEN

The results (**Figure 6.15**) is evident that the majority of Kenyan career women apply inadequate body shape assessment techniques. These findings therefore confirm the participants' ignorance about the prevalent rectangular body shape, or their own shapes as observed in this study (**Figures 6.13** and **6.14**).
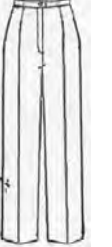
Career women's knowledge about appropriate styles for their perceived own body shapes: Question 12 was used to further establish career women's knowledge of their own body shapes. The question asked respondents to select appropriate styles for their perceived own body shapes from different styles that were provided. Answers given were accepted as correct if the respondents chose styles corresponding to each body shape as given in **Table 6.4**. The styles assigned to each body shape underwent the professional experts' scrutiny.

TABLE 6.4:   APPROPRIATE APPAREL STYLES FOR DIFFERENT BODY SHAPES

	1	2	3	4	5
J A C K E T S	Triangle (Pear) Hourglass	Apple	Hourglass	Rectangular Inverted triangle	Inverted triangle
S K I R T S	Triangle (Pear) Hourglass Apple	Hourglass Triangle (Pear)	Inverted triangle Rectangular	Inverted triangle Rectangular Hourglass	Inverted triangle Apple
P A N T S	Rectangular Inverted triangle	Apple Triangle (Pear)	Triangle (Pear) Hourglass	Rectangular	Inverted triangle Hourglass

Results on selected styles are presented in **Figure 6.16** below. It is clear from the results presented in **Figure 6.16**, that 63%, 58% and 56% of the respondents selected inappropriate styles for their self-reported rectangular, pear and apple body shapes, respectively. Forty-nine per cent and 47% of the respondents selected inappropriate styles for their self-reported hourglass and barrel body shapes. On average, 54% of the respondents selected incorrect styles for their reported (perceived) body shapes. As was shown in **Figures 5.2** in **Chapter 5** and **6.14**, the most prevalent body shape in this study was rectangular (74%); however, only 37% of the respondents were able to select appropriate styles for this figure. Therefore it is once again observed that Kenyan career women were ignorant and unrealistic about their body shapes (**Figures 6.13**), but were also ignorant and unrealistic about suitable styles for their perceived body shape as well as their actual body shape.

Consumers' selected styles for self-reported body shape (n = 180)

	Rectangle	Triangle	Apple	Hourglass	Inverted triangle
■ Inappropriate styles	63	58	56	49	47
☐ Appropriate styles	37	42	44	51	53
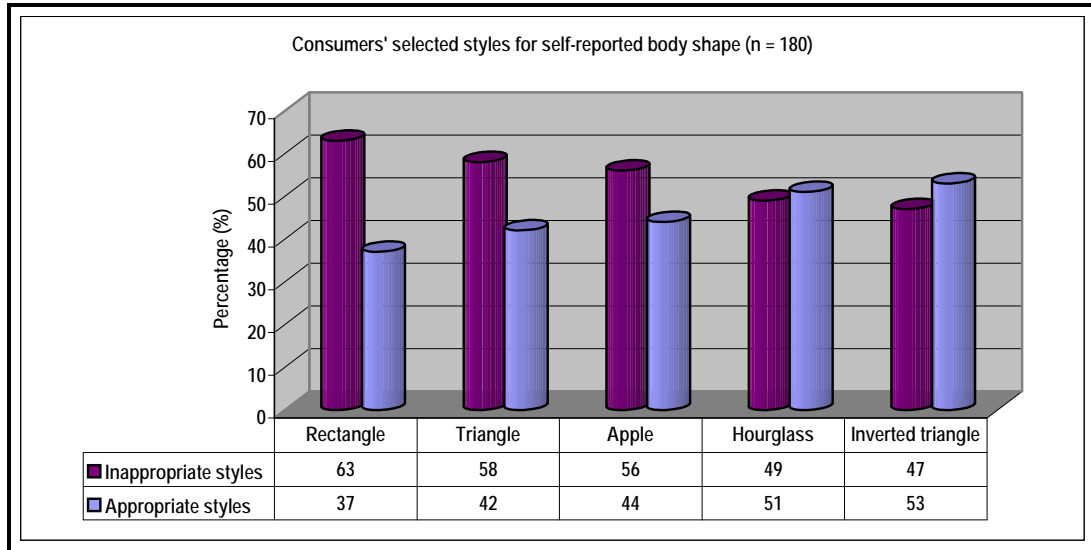
FIGURE 6.16: SELECTED STYLES FOR THE REPORTED OWN FIGURE TYPE

Career women's perceived ideal body shape: Question 10 was used to determine the career women's perceived ideal body shape and to find out whether they considered their own body shapes as ideal. The results are presented in **Figure 6.17**.

Ideal body shape versus self-reported body shape

	Hourglass	Triangle	Inverted triangle	Rectangle	Apple
☐ Ideal shape (n = 200)	76	14.5	8	0	1.5
■ Self-reported shape (n =183)	37.5	24	15.5	14	9
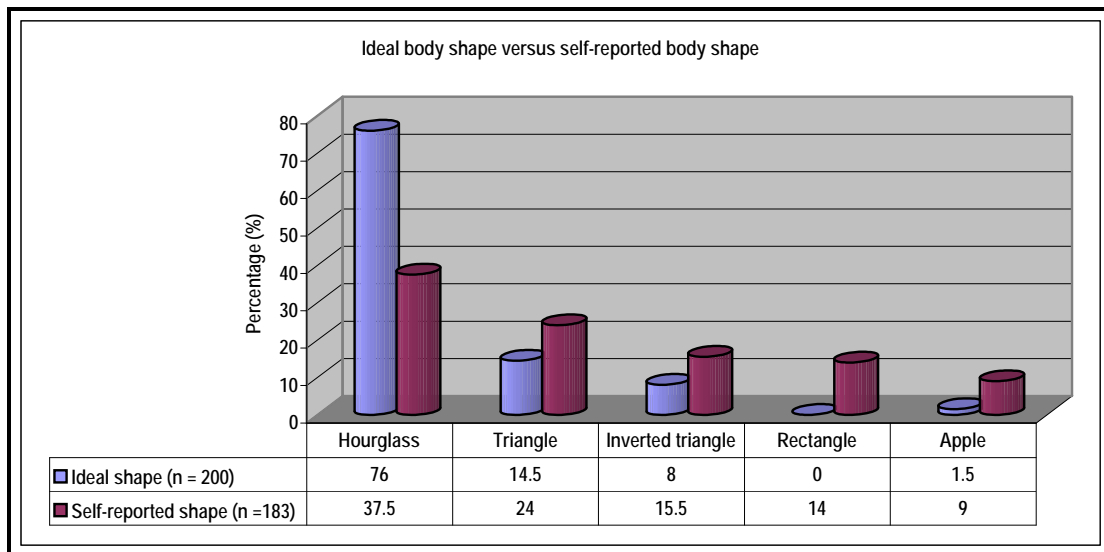
FIGURE 6.17: CAREER WOMEN'S PERCEIVED IDEAL BODY SHAPE VERSUS REPORTED OWN BODY SHAPE

The results indicate that 76% respondents reported the hourglass body shape as their ideal shape. However, 37.5% respondents also reported the hourglass body shape as their own

shape. Only 14.5% respondents reported the triangular shape as their ideal shape, while 24% reported the triangular body shape as their own body shape. Eight per cent of the respondents reported the inverted triangle body shape as the ideal shape, and 15.5% selected the inverted triangle body shape as their own shape. There were 1.5% respondents selecting the apple as the ideal shape, but 9% respondents selected the apple as their own shape. Kenyan career women were therefore not only unrealistic about their own body shapes, but they also did not perceive their own shapes as the ideal body. This could possibly indicate that Kenyan career women were dissatisfied with their own shapes (body cathexis). If apparel styles selected were not providing the expected appearance on one's body shape, as observed with the perceived ideal shape, it may generate a negative feeling towards one's body rather than to the apparel. Ultimately, one's body is blamed for the poor fit of the apparel.
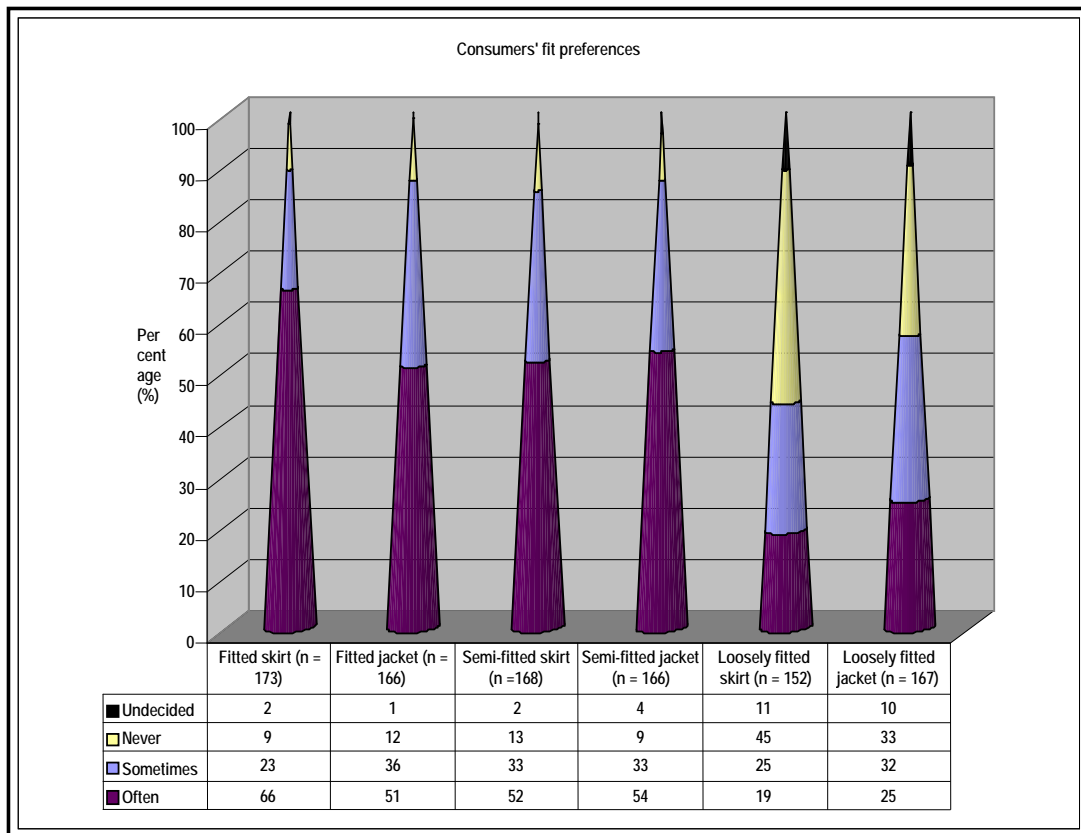
6.3.3 Primary objective 6: To determine and describe how career women's preferences for differently fitted skirts and jackets may contribute to fit problems with apparel (Question 19)

Question 19 was used to explore the Kenyan career women's fit preferences for differently fitted apparel items (skirts and jackets), and to compare their fit preferences with the critical fit points of their distinctive rectangular body shape (**Chapter 5 (Figure 5.10)**), as well as their selected styles (**Figure 6.16**), in order to establish how their fit preferences could contribute to the fit problems they were experiencing.

The results are presented in **Figure 6.18**, which clearly demonstrate that the majority of the Kenyan career women preferred to wear fitted and semi-fitted skirts and jackets often, and sometimes to work. Contrary to their preferences for the fitted and the semi-fitted skirts and jackets, the majority of the respondents prefer never to wear loose fitting skirts and jackets to work. This suggests that the majority of Kenya's career women prefer fitted and semi-fitted skirts while they least prefer loosely fitted skirts to work.

The fit preferences for differently fitted skirts and jackets were examined among different age groups of the career women. Statistically there were no significant associations between age and the fit preferences for fitted skirts (0.0652 > 0.05), semi-fitted skirts (0.8966 > 0.05) or loosely fitted skirts (0.9817 > 0.05). This may possibly imply that a fit preference for differently fitted skirts is not influenced by the age of the consumers.

Consumers' fit preferences

	Fitted skirt (n = 173)	Fitted jacket (n = 166)	Semi-fitted skirt (n =168)	Semi-fitted jacket (n = 166)	Loosely fitted skirt (n = 152)	Loosely fitted jacket (n = 167)
■ Undecided	2	1	2	4	11	10
□ Never	9	12	13	9	45	33
■ Sometimes	23	36	33	33	25	32
■ Often	66	51	52	54	19	25

FIGURE 6.18: CAREER WOMEN'S FIT PREFERENCES FOR DIFFERENTLY FITTED SKIRTS AND JACKETS

There were also no significant associations between age and fit preferences for fitted jackets (0.0652 > 0.05) or semi-fitted jackets (0.1445 > 0.05). There was a tendency (p < 0.1) of association between fit preferences for fitted jackets and the younger age group. There were significant (0.0247 < 0.05) associations between the mature age group and the fit preference for loosely fitted jackets. This may suggest that some of the older women prefer loosely fitted jackets, while the younger age group prefers the jackets with a tighter fit. Comfortable apparel items are possibly more important to the older group, while stylish fashion and not necessarily comfort could be a driving force for the younger group.

Kenyan career women's fit preference versus the critical fit points for their distinctive rectangular body and chosen styles: It is clear that Kenyan career women prefer to wear fitted and semi-fitted skirts and jackets to work (**Figures 6.18**). The critical fit points for the rectangular body shape deviate from those for the so-called ideal body shape. As observed in **Chapter 5**, the majority of the participants had large thighs (76%), large buttocks (91%) and large stomachs (70%), a fully rounded upper back (70%) and a large bust (60%). Where body shape characteristics are not considered in the manufacturing of ready-made apparel, a

person with such prominent critical fit points is likely to experience tight fit problems around those prominent body features. If the majority of the available designs were based on the understanding of the curvy rectangular body shape, fitted skirts and jackets would be made to cater for their preferred apparel. Where no body shape characteristics are considered in the manufacturing of ready-made apparel, the curvy rectangular body shape could be accommodated more comfortably and pleasingly by loosely fitted apparel, as it contains enough ease of design (style) and wearing (comfort). In such instances, the fit problems encountered could be ascribed to inappropriate fit preferences that do not take into account consumers' body shapes and the critical fit points associated with those shapes.

Statistically, there were significant (0.048 < 0.05) associations between the fit preferences for a fitted skirt and the acceptable fit at the stomach region, and significant (0.0208 < 0.05) associations between the fit preferences for a semi-fitted skirt and the fit problem of tightness experienced at the thigh region. Respondents who reported having acceptable fit at the stomach region preferred a fitted skirt, while those with fit problems of tightness at the thigh region preferred a semi-fitted skirt. There were significant (0.0011 < 0.05) associations between the fit preferences for a semi-fitted jacket and the fit problem of tightness experienced over the bust region. Respondents who reported fit problems of tightness over the bust region preferred a semi-fitted jacket. These results may suggest that the comfort required around the stomach, the thighs and the bust regions could determine the degree of ease/comfort necessary in the skirts and jackets for some Kenyan career women.

6.4 OVERALL DISCUSSION OF THE RESEARCH OBJECTIVES

6.4.1 Assessing and describing career women's self-perceived fit issues with the ready-made apparel in Kenya (Primary objective 4)

The highly rated quality of imported new (78%), custom-made (72%) and imported second-hand (65%) ready-made apparel in terms of good fit, may be explained in terms of appealing characteristics compounded in imported apparel such as a variety of styles, good workmanship, quality fabrics and brand names (Mason, 1998:90; McCormick *et al.*, 2002), rather than in stipulations of excellent fit. The consumers' "ego" associated with imported apparel could also be seen as an issue affecting their purchasing of imported new and used apparel as opposed to the local apparel, which recorded highest poor fit responses and the lowest good fit responses (Li & Gallup, 1995; Hansen, 1999:359; Mhango & Niehm, 2005). By virtue of imported and sometimes branded labels attached to the apparel, consumers may not even reflect on any of the other necessary considerations such as fit, before purchasing

the apparel item (Agbonifoh & Elimimian, 1999). De Klerk and Tselepis (2007) observed that consumers may use extrinsic aspects to select apparel items that would not necessarily satisfy their fit needs but that would rather satisfy their emotional needs.

The good fit of custom-made apparel could be ascribed to the fact that tailors gain experience through constant interaction with the body shapes and dimensions of their consumers. Tailors' frequent interaction with and observations of different body shapes and dimensions facilitate a continuous learning process, enabling them to make better-fitting apparel. Kenya's locally made apparel was ranked last in terms of good fit and recorded the highest poor fit (26%) responses, higher than all the other categories. The poor fit could be ascribed to poorly skilled personnel in the apparel industry, inadequate and outdated machinery and lack of quality raw materials in Kenya's apparel industries, as observed by Mason (1998) and McCormick *et al.* (2001). Other reasons could also be the unrepresentative sizing systems in terms of the body shapes and dimensions of the current population (Zwane & Magagula, 2006; Shin & Istook, 2007; Honey & Olds, 2007).

As for the fit of imported apparel, new and ready-made imported apparel items are sold in boutiques and chain stores, which respectively scored 84% and 70% responses on good fit. The second-hand stores recorded 66% responses on good fit, as they sell imported exclusive, second-hand, ready-made apparel. Although apparel items available in boutiques and second-hand stores may be limited in varied sizes, they do offer unique and good-quality apparel in terms of materials/workmanship (Mhango & Niehm, 2005). In addition to offering unique and good-quality apparel, chain stores ensure customer satisfaction, as highlighted by Otieno *et al.* (2005).

Market stalls were ranked fourth, with 52% responses, while supermarkets and trade fairs were ranked fifth and sixth with 47% and 46% responses respectively. It should be noted that the market stalls, supermarkets and trade fairs sell mixed apparel merchandise, ranging from local ready-made, imported new and imported second-hand apparel. The quality of the apparel varies from fair to poor, depending on the categories available in each case. Most of these stores have inadequate fitting rooms and therefore the consumers cannot adequately assess the fit of apparel items before purchasing. All these factors explain the quality of apparel sold. A factory outlet, which was ranked last (22%), sells locally made apparel items of poor quality. According to Rasband (2001a:8), the apparel merchandise in a factory outlet is cheap and is usually made of low-grade materials and shows poor workmanship.

Contrary to the Kenyan career women's perceived good fit of the imported new and second-hand ready-made apparel, as well as of the ready-made apparel items sold in boutiques,

chain stores and second-hand stores, they expressed dissatisfaction with the way that ready-made apparel items fit their critical fit points. On average, the majority (65%) of the career women in the sample reported more problems with either tight or loose fit than they reported an acceptable fit (35%) at the various fit points of the upper and the lower torsos. Considering that most ready-made apparel items are based on the hourglass body shape, which is considered ideal in the apparel industry (Newcomb & Istook, 2004a & 2004b; Zwane & Magagula, 2006), such fit problems are inevitable because Kenya's distinctive body shape is a curvy rectangle type (**Chapter 5, paragraph 5.2.3.2**), with body characteristics that do not match those of the well-proportioned ideal body shape. Therefore, apparel items produced with grading based on standard linear surface increments (Schoefield & LaBat, 2005a & 2005b) would not fit these career women's distinctive shape with their unique features. Regarding fit problems with length, it is also apparent that more of the Kenyan career women (61%) encountered length-fitting problems (reported too short or too long), than those who felt that the lengths were acceptable (39%). As in the case of width problems, the length problem points in most cases to the linear proportional grading theory that underlie most pattern development systems, and have been cited as the major contributing factor to length fit problems (Bye & Delong, 1994; Loker *et al*., 2005; Schofield, 2007 in Ashdown, 2007:180, 188).

Finding apparel items that fit well can be time-consuming and frustrating, particularly to female consumers who often have to try on several assortments before finding one item that fits (Ashdown, 1998; Workman & Lentz, 2000). When the respondents were asked whether they were generally satisfied with the fit of ready-made apparel (**Figure 6.3**), 75% of the career women expressed dissatisfaction with the fit of ready-made apparel – generally in terms of the search process, the available styles and the latest fashion in appropriate styles and sizes. These results concur with the findings of Kurt Salmon Associates (1996) in the United States of America and Otieno *et al.* (2005) in the United Kingdom, that over 50% female consumers were dissatisfied with the fit of ready-made apparel. The dissatisfaction with ready-made apparel may be due to frustrations and confusions encountered during a search for apparel. Female consumers flip through several assortments of styles and sizes trying to get apparel items that may fit correctly (Ashdown, 1998; Workman & Lentz, 2000; Otieno *et al.*, 2005). Frustration in their search for apparel are thought to be brought about by non-standardised sizes between styles, designers and manufacturers that employ different body measurement techniques, marketing gimmicks and varied quality control practices (Hudson, 1980; LaBat & DeLong, 1990; Solomon & Rabolt, 2004:10-11). The different size codes are also not instructive enough to guide the consumers while selecting apparel, but are rather confusing as many size codes do not directly relate to female body dimensions (Workman, 1991; Chun-Yoon & Jasper, 1995 & 1996; Holzman, 1996). In this study, the

group of career women also lacked knowledge about the meaning of the terms used on size labels (**Figures 6.6 & 6.10**), which could actually serve as useful guides in the selection of apparel.

Inadequate understanding, worsened by confusion, could result in apparel items failing to meet the specific needs of the consumer (Mitchell & Papavassiliou, 1999). Experienced consumers are adept at forming choice-sets. Experience helps to make potential consumers selectively observant. Kenya's career women's perceptions concerning the sources of the fit problems they are experiencing (**Figure 6.4**), demonstrated that the majority of them felt that both the apparel industry (89%) and their body shapes (78%) were the sources of fit problems.

Informed consumers with adequate knowledge about the products they buy, have a better chance to locate the locus of the cause of the problem and perhaps link the apparel manufacture with the fit problems. Because of the Kenyan career women's lack of knowledge about size (77%) and fit (98%) issues (**Figures 6.6** and **6.12**), they may be confused concerning the source of fit problems common to the ready-made apparel, and hence attribute the locus of the problem externally by blaming the industry or internally by blaming their own bodies (Weiner, 1986). However, if the consumers blamed their bodies for the fit problems, they would negatively direct their disappointing experience encountered with apparel to their bodies, rather than to the apparel items, as stated by LaBat (1990), Fiore and Kimle (1997:30) and Yu , 2004:33). In cases where the consumers blame their bodies for fit problems, they would probably experience their bodies negatively, while they suffer financial loss and exploitation by the industry. They would also possibly develop emotional distress resulting from the continuous purchasing of substandard apparel items. Mitchell and Papavassiliou (1999) observed that inadequate, ambiguous, conflicting and misleading information often lead to consumers' confusion, whereas confusion can affect both their rights and the quality of their decisions. Confused consumers are less able to process information and are more vulnerable to making less than optimally appropriate choices in apparel styles and sizes. Ultimately, they end up with inappropriately fitting apparel.

6.4.2 Determining and describing Kenyan career women's knowledge about the communication of size (key body dimensions) and fit (body shapes) (Primary objective 5)

A size label is supposed to communicate size to the consumers, with clearly indicated body dimensions, as it is a manufacturer-to-consumer communication channel to enable consumers to make efficient purchase decisions (Chun in Ashdown, 2007:220). Misleading

information often leads to consumers' confusion, and confusion can affect the quality of consumers' decisions (Mitchell & Papavassiliou, 1999; Mason, De Klerk, Sommervile & Ashdown, 2008). It was therefore necessary to explore which size labels were familiar to the group of Kenyan career women to establish whether the information displayed on size labels was useful enough to the consumers. The findings of this study (**Figure 6.5**) indicate that uninformative/tacit labels were on average familiar to the majority (97%) of these women, but were ranked as effective by only 51% of the respondents. The informative labels were much less familiar (7%), but overwhelmingly, 99% respondents ranked them as effective. It appears that Kenya's apparel industries continue to use the tacit labels contrary to KEBS (2001:8)/**Appendix 4B** recommendations, and regardless of the inadequacy of the information to guide consumers in their selecting and purchasing of ready-made apparel. A size label is supposed to communicate sizes and body types to the consumers, with clearly indicated body dimensions and a description of the body type that the apparel item was designed to fit (KEBS, 2001:8; Faust *et al.*, 2006). It should specify whether the person is tall with large/small bust and large/small hips, short with large/small bust and large/small hips, or regular (medium height) with large/small bust and large/small hips (Glock & Kunz, 1995:108; Chun-Yoon & Jasper, 1995; Chun-Yoon & Jasper, 1996).

With the majority of the career women in the group ranking the informative labels as effective, this validates that each apparel item should bear a label that is well understood by the consumers and that will require minimal explanation to the consumers – regardless of the price, type of apparel or even the manufacturer. The Kenyan career women's preference for informative size labels affirms the findings of Chun-Yoon and Jasper's (1995) study that the majority of consumers prefer the wordless pictogram, which is self-explanatory. These findings also support the recommendations by KEBS (2001:7) and Faust *et al.* (2006) that size labels should be adequate, legible and durable to serve as future reference for the consumers.

It was necessary to gauge whether career women's knowledge concerning different labels was adequate to provide for an informed and appropriate apparel selection. However, the results (**Figure 6.6**) clearly demonstrated that career women lacked knowledge about size labels, with the majority of them (77%) giving incorrect meanings for the size codes and size contents. This highlights the fact that the size labels that are familiar to the Kenyan career women were not instructive enough to provide useful guidance for them when selecting appropriate apparel sizes.

Workman (1991), Desmarteau (2000) and Brown and Rice (2001:147-148) underline the importance of consumers' knowing their own key dimensions, and also which body

dimensions are necessary for the selection of specific apparel items. It was clear (**Figures 6.7**, **6.8** and **6.9**) that the Kenyan career women in the group were only partially knowledgeable about their bust and waist dimensions, but they were more knowledgeable about their hip dimensions. These findings concur with Alexander, Connell and Ulrich's (2005) findings (in the United States of America) that women understood their hip measurement better than their bust and waist dimensions. An observation from this study (**Chapter 5 (Table 5.9)**) was that the majority (91%) of the respondents had large buttocks, which are directly related to the hip dimensions. Problems with a tight fit over the hips (54%), the buttocks (43%) and the thighs (43%), were reported (**Table 6.2**) – again confirming that these regions may call for closer attention.

A consumer with a prominent hip region is most likely to experience problems of tight fit, which may aggravate her desire to understand the measurements associated with it. Chun (in Ashdown, 2007:226) emphasises that consumers have to know their body dimensions to identify their apparel size and to be able to make appropriate size and style selections. Accurate knowledge about one's body dimensions can also facilitate a thorough and accurate assessment of apparel sizes. If size labels were informative (self-explanatory) it would be easy for the consumers to compare the information provided on them with their own key dimensions. Uninformative labels combined with consumers' ignorance about the meanings attached to the labels can contribute to consumers' confusion and inappropriate apparel selection. In the event that the consumers understand the meaning of the codes used on size labels and their contents, their knowledge about the key body dimensions becomes useful for the selection of appropriate styles and sizes (Mason *et al.*, 2008). Participants' knowledge about their sizes in different size designations (**Figures 6.10** and **6.11**) indicated that Kenya's career women were moderately knowledgeable about their sizes designated with numbers 8 to 24, but were poorly knowledgeable about sizes designated with the even numbers 32 to 50. These findings substantiate Yoon and Radwin's (1994) results that consumers' estimations of their body sizes were not accurate. Zwane and Magagula (2006) report that most developing countries in Africa use adapted versions of the British sizing systems that cannot reflect the true picture of the intended consumers in developing countries.

It has also been observed that the lack of standardisation in sizing systems occurs not only with apparel of different brands and styles, but also within apparel items of the same numbered sizes within the same brands and styles (LaBat & DeLong, 1990; Workman & Lentz, 2000; Brown & Rice, 2001), resulting in what Keiser and Garner (2003:304) refer to as size migration, where one consumer fits into a range of three or more different sizes. Depending on the cut of the apparel items or the manufacturer's sizes, a consumer's size

keeps migrating between smaller and larger sizes. A practical example of such a migrating size is in vanity sizing with large dimensions being reflected in a smaller size designation (Tamburrino, 1992a & 1992b; Ashdown & DeLong, 1995; Glock & Kunz, 1995:111; Keiser & Garner, 2003:304; Faust *et al.*, 2006; Shin & Istook, 2007). Because of the non-standardised sizing systems used by apparel industries, it may be difficult to draw conclusions from the consumers' reported sizes, as it is not possible to isolate sizing systems that are currently being used in Kenya.

Body shape acts as a framework for apparel, and a size label is suppose to communicate sizes and body types to the consumers, with clearly indicated body dimensions and a description of the body type that the apparel item was designed to fit (Faust *et al.*, 2006). Although manufacturers/retailers hardly include body shape as a communication of fit, it was deemed necessary in this study to determine whether terms used on size labels to represent body shapes, were familiar and comprehensible to Kenya's career women. As in the case of familiarity with effective (informative) labels, the findings on body shape terms represented on size labels (**Figure 6.12**) demonstrated that the majority (69%) of the respondents were unfamiliar with female body shape terms that are represented on size labels/tags. One could speculate that apparel industries in Kenya are neglecting the recommendation by KEBS (2001:7)/**Appendix 4B**, to use instructive labels. This is consistent with the study of Faust *et al.* (2006), carried out in Canada. A lack of these terms on size labels/tags therefore would mean inappropriate apparel selection by the consumers, as they have nothing to guide them or to refer to (Mason *et al.*, 2008). A size label should not only indicate key dimensions but also a description of the body type that the apparel item has been designed for (Glock & Kunz, 1995:108; Chun-Yoon & Jasper, 1995). It is also obvious from the results (**Figure 6.12**) that almost all the respondents (98%) could not describe the size label terms representing female body shapes. Consumers' lack of knowledge about the terms representing female body shapes suggests that the consumers were uninformed about the important terms which could indicate to them the suitability of apparel items for different body shapes (Brown, 1992:54-55; Glock & Kunz, 1995:110; Brown & Rice, 2001:146; Faust *et al.*, 2006; Chun in Ashdown, 2007:226).

Consumers have to know the various body shapes to ease their search for appropriate styles suitable for different body shapes. When career women were asked to describe the five prevalent body shapes presented as illustrations (**Figure 6.13**), 66% of the respondents, on average, were unable to describe the shapes correctly. This suggests that Kenya's career women were ignorant about the established body shapes. However, correct descriptions of the hourglass figure scored 50%. This could be due to the hourglass body shape being a household name in fashion marketing. The ideal figure, which is basically a slim hourglass

body shape, is featured in all fashion magazines, modelling and catwalk scenarios, making it popular and a regular shape in the daily lives of the consumers (Ashdown & DeLong, 1995:48; Yu in Fan *et al.*, 2004).

Since a body shape is a framework for proportioning apparel, it must be well understood by users in terms of their body proportions. For an apparel item to attain a good fit, the body and the apparel selected must be in a harmonious relationship. A consumer without knowledge could assume that all people have bodies similar to that of the fit model or to their perceived ideal shape (Mason *et al.*, 2008). These assumptions could lead to them purchasing apparel suitable for the fit model or the perceived ideal shape, rather than based on their own shape. A consumer who is ignorant about the elements of good fit is also likely to select apparel based on other factors such as colour, style and current fashion, leading to physically attractive apparel as it is displayed in the retail environment, and a disappointing look when worn on the actual body. Knowledge about the different body shapes would facilitate comparison of the proportions between different body shapes, and would ultimately ease apparel selection. When one compares the group of consumers' perceived (self-reported) body shapes with their identified body shapes, it is apparent (**Figure 6.14**) that they do not perceive their own body shapes realistically – possibly due to a confusion regarding different body shapes. The state of confusion and unrealistic self-identity could possibly be the cause of their inappropriate apparel selection (Mason *et al.*, 2008).

The self-reported hourglass body shape by the majority of the respondents could have been attributed to its fame in the fashion world and in the marketing of fashion (Ashdown & DeLong, 1995:48; Yu in Fan *et al.*, 2004). In the Alexander, Connell & Ulrich (2005) study done in the USA, about 50% of the women self-reported their body shapes as an hourglass, and yet the majority of them had rectangular figures. It may be reasoned that continuous apparel production and promotions based on the ideal hourglass body shape continue to deprive the consumers of their true identity. Persistent advertisements based on the hourglass shape deny consumers a chance to see themselves more realistically – and hence they dress inappropriately. A basic knowledge about the elements and principles of design applicable to the various body shapes would enable consumers to select more suitable styles and sizes of apparel.

As in the case of the key dimensions necessary for identifying appropriate size, consumers must also be able to identify their body shapes accurately in order to select suitable apparel items. There are several ways that consumers could acquire knowledge about their body shapes. Keen retailers, through magazines and marketing pamphlets, could sensitise their clients by providing information on different ways to establish their own figure types. It is

believed that, if a consumer could apply several techniques for the assessment of her own body shape, then her chances of selecting appropriate apparel would be high. The application of several techniques enhances a deeper understanding of one's body shape and of how the body's proportions relate to one another (Lyle & Brinkley, 1983:58-60; *Reader's Digest*, 1988: 46-47, 82-83; Liechty *et al.*, 1992:33-38).

Respondents were asked to report the body shapes assessment techniques that they had applied, to establish whether their knowledge about their own body's shapes had been enhanced by self-evaluative techniques learnt through reading, observations or any other medium. It is believed that when individuals are more informed about self-assessment techniques to determine body shape, they will be more accurate in identifying their own body shapes – and hence be more skilled to select appropriate and suitable apparel items. Apart from the use of a mirror for the assessment of the body shape by the majority (64%) of the respondents, other methods of body shape evaluation have been scantily used, as confirmed in this study (**Figure 6.15**). The use of a mirror alone is inadequate to facilitate a comprehensive assessment and a deeper understanding of the characteristics of one's body and the proportions that contribute to the actual body shape. More than seven evaluation techniques have been reported to enhance a thorough knowledge about body shapes and hence, skills in appropriate selection of ready-to-wear apparel. For example, tracing the body outline against the wall; using a yardstick to compare hips, bust and shoulders; dressing in minimal clothing and assessing the shape using a long mirror; studying photos taken in minimal apparel; comparing the body shape with established types; and asking friends/experts to analyse your shape (Lyle & Brinkley, 1983:58-60; *Reader's Digest*, 1988:46-47, 82-83; Liechty *et al.*, 1992:33-38; Rasband, 2001b: 20-23, 31-32;). These findings showed that Kenya's career women hardly apply any body shape evaluation techniques for the assessment of their own body shapes, and confirms their ignorance about their own body shapes (**Figure 6.14**) – hence their selection of inappropriate apparel.

Inappropriate apparel styles distract attention, emphasise a figure problem and undermine the confidence of the wearer. A well-fitted style hides a body shape's problems, and directs attention away from the problem areas, thus contributing to the psychological and social well-being of the wearer (Rasband & Liechty, 2006: 8). Apparel styles should alter the negatively perceived proportions of the body and provide a sense of satisfaction to individuals who do not fit within the cultural ideals of size and weight (Fiore & Kimle, 1997:331). When consumers understand the different body shapes, their own body shapes and the elements and principles of design appropriate for the different shapes, they would wear satisfactory apparel styles. In this study, respondents were asked to select appropriate styles from different styles that were provided based on the five prevalent body shapes (hourglass,

apple, triangle, rectangle and inverted triangle). It was reasoned that if the respondents were able to select appropriate styles for their reported body shapes from the three categories provided (jackets, skirts and trousers), it would also be possible that they were knowledgeable concerning their own body shapes and the appropriate selection of well-fitting apparel styles. The findings of this study (**Figure 6.16**) illustrate that 54% respondents were not knowledgeable about the appropriate selection of suitable apparel styles for their self-reported body shapes. Only 37% of the respondents were able to select appropriate styles for the distinct rectangular shape that emerged in this study. As in the case of knowledge about the illustrated prevalent body shapes, Kenya's career women were not only ignorant about their own body shapes, but also about suitable styles for their body shapes – and therefore, they would likely experience fit problems with apparel.

The physical structure of the ideal body shape may be quite familiar to most consumers, but they may not understand what characterises the ideal shape and how their own shapes deviate from it. Consumers' lack of knowledge about the various body shapes and about their own body shape, as observed in this study, may highlight their inability to comprehend proportional comparisons between the ideal body shape and any other shape. The consumers assume that the commonly presented ideal shape represents all the other shapes, and therefore they perceive it as the only perfect one. This has an implication with the fit of apparel because a consumer will purchase apparel items that are suitable for their perceived ideal body shape rather than for their own shape. In this study (**Figure 6.17**), the results indicated that the majority (76%) of this group of Kenyan career women perceived the hourglass body shape as an ideal figure, but they did not perceive their self-reported body shapes or their distinct rectangular shape (from dimensions and photos) as the ideal body shape. The perception of the hourglass shape as the ideal shape may be attributed to the fact that the current marketing of fashion uses it for advertisements. This, according to Fiore and Kimle (1997:3), provides a symbol of expectation for women and has negative implications, as the women purchase apparel items that would look attractive on the ideal body shape – but looks disappointing on their own body shapes. When a woman tries to dress her body with the available apparel items, the comparison to the ideal is inevitable, and this signals to the woman that something is wrong with her body, rather than with the apparel itself. This may undermine the confidence of the wearer and cause unnecessary emotional suffering for an individual.

6.4.3 Determining and describing how career women's fit preferences for differently fitted skirts and jackets may contribute to fit problems in Kenya (Primary objective 6)

Fit preference is subjective and varies from one person to another. The comfort or ease that a person requires in an apparel item depends on the physical characteristics of that individual's body   (critical fit points) as well as internal influences such as personal preferences, expectations and the look that that individual desires (Alexander, Connell & Presley, 2005). Kenya's career women's preferences for differently fitted skirts and jackets (**Figure 6.18**) indicate that the majority of the respondents prefer fitted and semi-fitted skirts and jackets, while they least prefer loosely fitted skirts and jackets. An observation made in this study (**Chapter 5)**) indicates that large buttocks, stomachs, thighs and bust characterise the distinct rectangular shape. The loose fit problems experienced around the shoulders, the back width and neck line regions also highlights that the upper torsos of the career women in Kenya were smaller than the base pattern used in the apparel industry. These characteristics deviate from the characteristics of the so-called ideal shape that is used for pattern design and apparel creation. Consumers with these prominent body characteristics and wearing fitted or semi-fitted skirts and jackets are likely to experience problems with tight fit at the area of prominence. The consumer's preferred needs regarding fit would be catered for If the available designs were based on the prominent characteristics of this specific body type (curvy rectangular body shape). In the absence of the distinctive body shape as a design guide, the curvy rectangular body shape could be accommodated more comfortably and pleasingly by loosely fitted apparel as they contain enough wearing (comfort) and design (style) ease. It is possible that consumers' fit preferences are dictated by fashion trends rather than their knowledge about appropriate apparel styles for their shapes and their critical fit points. In such instances, fit problems encountered could be ascribed to consumers' inappropriate fit preferences that do not take into account their body shapes and the critical fit points associated with their shapes.

The body's size and shape and the perceived needs of the consumer determine appropriate apparel styles and sizing in terms of the fabric's properties, the amount of ease required for comfort, movement and an attractive appearance (Huck, *et al.*, 1997; DeLong *et al.*, 1993). The fit preferences of the consumers must therefore be synchronised into overall suitable and accepted styles. Regarding the chosen styles, the majority (63%) of the respondents were unable to select suitable styles for the distinctive rectangular body shape, but about half (51%) of them were able to select styles for their perceived body shape (hourglass). These findings may suggest that fit problems encountered by the Kenyan career women could be ascribed to their fit preferences that do not take into account their body's actual

characteristics. Considering that consumers were able to select suitable apparel for the hourglass shape (fit model), it reveals that Kenya's career women's fit preferences could be influenced by fashion trends rather than by the comfort needed from fashionable apparel. Internal influences such as fashion trends, expectations and the look that one desires also influence consumers' fit preferences (Alexander, Connell & Presley, 2005). Physical (aesthetic) characteristics or the emotional experience that the consumers expect or get from purchasing certain apparel may also contribute to their preference for a certain degree of fit in specific apparel rather than considering the body's actual characteristics (Pisut & Connell, 2007; De Klerk & Tselepis, 2007). It should be recognised that body-hugging apparel items were in fashion at the time of data collection and are still currently in fashion. In this respect, problems encountered at critical fit points could be attributed to consumers' inappropriate fit preferences that do not take their critical fit points into consideration. Consumers' ignorance on the appropriate degree of fit required in different apparel styles, and the basic elements and principles of design applicable for different body shapes, could also lead to inappropriate fit preferences and consequently, fit problems.

Chapter 7

CONCLUSIONS, EVALUATIONS, CONTRIBUTIONS TO THEORY AND RECOMMENDATIONS

7.1   INTRODUCTION

The aim of this research was two-fold. The first phase had three objectives (1, 2 and 3) with the aim of:

- Identifying and describing distinctive female body shapes of career women in Kenya, using body dimensions and photographs;
- Describing the differences between the emerging distinctive body shapes (from measurements and photographs) and the Western distinctive shapes; and
- Describing and analysing the fit implications associated with the emerging distinctive body shapes of Kenya's career women.

The second aim (phase two) entailed three objectives (4, 5 and 6) aimed at:

- Assessing and describing career women's self-perceived fit issues with the ready-made apparel in Kenya;
- Determining and describing Kenyan career women's knowledge about the communication of size (key body dimensions) and fit (body shapes); and
- Determining and describing career women's fit preferences for differently fitted apparel items in Kenya.

A quantitative approach was used throughout the study. In the first phase, a body measurement form was used to record the body measurements obtained from the participants. An assessment scale was also used to record visual assessment data from the photographs. For the second phase, a structured questionnaire was used to collect data for the purposes of assessing and describing perceptions regarding general fit problems with the ready-made apparel in Kenya, determining and describing career women's knowledge about the communication of size (key body dimensions) and fit (body shapes), and describing career women's fit preferences for differently fitted apparel items in Kenya.

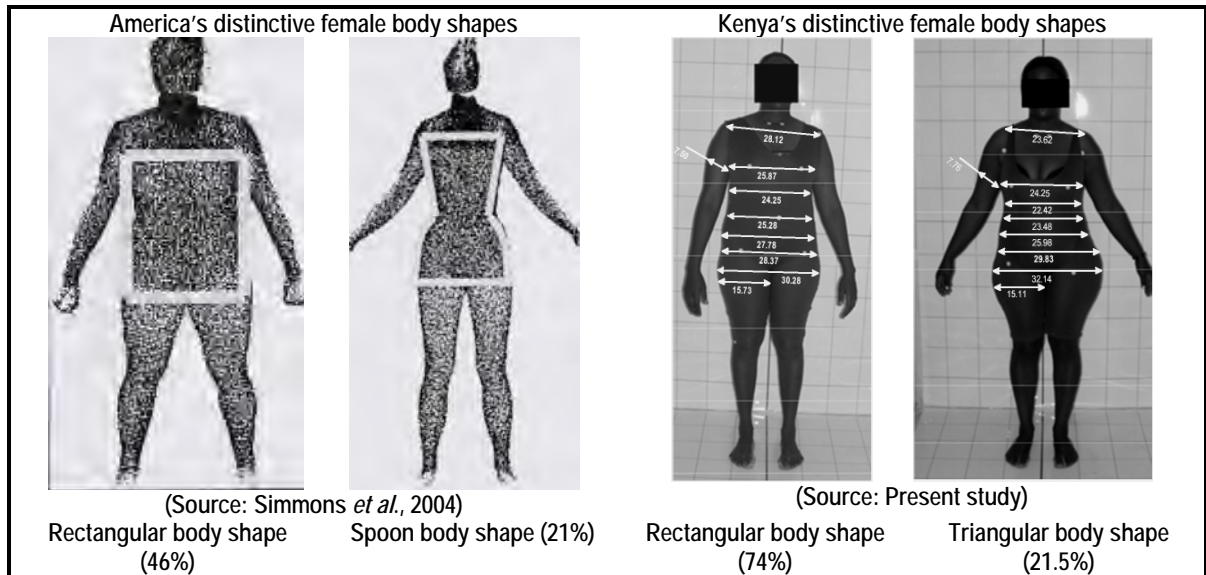## 7.2 GENERAL CONCLUSIONS REGARDING PHASE ONE DATA

7.2.1 Conclusions regarding the distinctive female body shape of career women in Kenya (Objective 1)

It can be concluded that the most dominant body shape that emerged from this study is a curvy rectangular shape. Although the most prevalent body shape in Western society is also rectangular, Kenya's rectangular body shape differs significantly from the Western shape. The Western rectangular shape is nearly straight when viewed from the side, front and back. Contrary to the Western body shape, Kenya's rectangular shape is curvier, particularly from the side view, with large buttocks ("**d**") and a rounded upper back region, giving rise to a well-defined hollow back waist region. The front is typified by a well-pronounced stomach, similar to the letter "**D**" (**Figure 5.5**). As observed in this study, the round upper back regions tend to become less pronounced, while the stomach gets more rounded ("**D**"), as the female matures (**Figures 5.3** and **5.4** in **Chapter 5**). The rounded upper back and the "**D**" stomach shape were significant with the older women, while the well-defined hollow waists were not significant in or confined to any specific age group only.

7.2.2 Conclusions regarding differences between the distinctive body shapes of Kenya's career women and the Western (American) distinctive body shapes (Objective 2)

In conclusion, it is clear that the rectangular body shape is the most prevalent body shape, both in this study and in the United States of America. The second most prevalent shape in this study is the triangular shape, which differs from the American second most prevalent spoon shape (**Figure 7.1**). As discussed earlier, in **Chapter 5** (**paragraph 5.5**), this study used only three measurements (bust, waist and hips) for defining body shape, while America's classified female shapes used six measurements (bust, waist, hips, high hip, abdomen and stomach), hence a comparison cannot be done on all aspects. However, as seen in **Figure 7.1**, the American rectangular shape appears straight, all the way from the shoulders to the hip line. The distance between the hip and waistline appears shorter, with no clearly defined hipline or waist indentation. Kenya's rectangular shape –contrary to the American shape – appears curvier, particularly around the hip and thigh areas. The waist to hipline distance appears longer, with a well-defined thigh bulge. It should be noted (**Figure 7.1**) that the American figures are standing with the legs apart; thus the appearance of the hip outline shape is not realistic. Since the second most distinctive body shape in America differs from Kenya's second most distinctive body shape, critical comparisons will not be
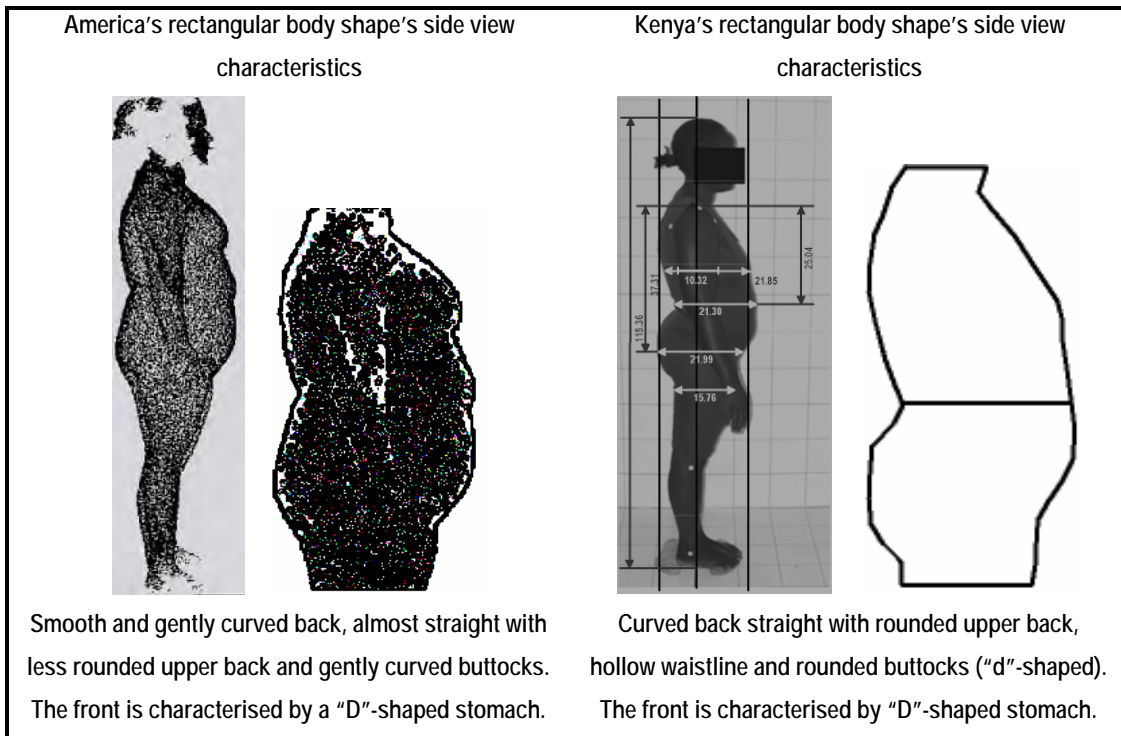
made, although from the pictures given (**Figure 7.1**), one could say that both body shapes (Spoon & Triangle) have wider hips than bust and shoulders.

America's distinctive female body shapes	Kenya's distinctive female body shapes
(Source: Simmons *et al.,* 2004)	(Source: Present study)
Rectangular body shape (46%) Spoon body shape (21%)	Rectangular body shape (74%) Triangular body shape (21.5%)

FIGURE 7.1:   DISTINCTIVE FEMALE BODY SHAPES IN AMERICA AND KENYA

A side view characteristic found with the American distinctive rectangular body shape is the large stomach, which could be "**D**"-, "**B**"- or "**b**"-shaped, as observed by Connell *et al.* (2006). It is also characterised by flat back curvature, right from the upper back to the buttocks, appearing like an apple body shape's profile view (**Figure 7.2**) (Simmons *et al.,* 2004). Rasband and Liechty (2006:25-26) report that once a rectangular shape attains more weight, it results in an apple shape (Rasband & Liechty, 2006:25-26). The front view of Kenya's distinctive rectangular shape is characterised by a similar width over hips and shoulders, with a small waist indentation. The thighs bulges out on the side beyond the hip width and are full on the inside (at the crotch), in contrast to the Western body shape. A rounded upper back characterises the profile view, with more roundness concentrated just below the shoulder line and the chest. The back curvature tapers narrowly towards the waistline and abruptly meets the full buttock contour, resulting in a deep hollow waist region. The front view in profile is characterised by a high abdominal contour that begins to protrude just below the bust line. It begins to curve round almost immediately and increases as it leads down to the crotch at the centre of the body, resulting in a "**D**" appearance (**Figure 7.2**).

America's rectangular body shape's side view characteristics	Kenya's rectangular body shape's side view characteristics

Smooth and gently curved back, almost straight with less rounded upper back and gently curved buttocks. The front is characterised by a "D"-shaped stomach.	Curved back straight with rounded upper back, hollow waistline and rounded buttocks ("d"-shaped). The front is characterised by "D"-shaped stomach.

FIGURE 7.2: SIDE VIEW CHARACTERISTICS OF AMERICA'S AND KENYA'S DISTINCTIVE RECTANGULAR BODY SHAPES

7.2.3 Conclusions regarding apparel fit problems associated with the distinctive body shapes of Kenya's career women (Objective 3)

Apparel based on the hourglass body shape as a fit model used for the production of ready-made apparel (Alexander *et al.*, 2005; Zwane & Magagula, 2006), makes fit problems such as tight hips, crotch, bust and stomach experienced by Kenya's career women, inevitable. A curvy rectangular body shape with well-pronounced body characteristics such as large buttocks, rounded upper back, hollow waistline and "**D**"-shaped stomach, is likely to experience fit problems around these regions.

As predicted in **Chapter 5** (**paragraph 5.6**), major fit problems that could be expected to be experienced by a woman with a curvy rectangular shape could include tight fit at the hip region, crotch line and thighs, which may lead to wrinkles and ripples forming around the affected area, a tight fit at the waistline that could lead to wrinkles around the waist region, apparel riding up, and inappropriate style and dart positions due to a large stomach ("**D**"), tight bust line, tight armholes and tight pull in the upper back area. Diagonal wrinkles may also form around the prominent regions of the body.

In confirmation of the predicted fit problems, the Kenyan career women expressed dissatisfaction with the way that ready-made apparel items fit their critical fit points. The majority of the career women reported fit problems more than they reported acceptable fit at the various fit points of the upper and the lower torsos. There were problems of tight fit reported at the lower torso's critical fit points (hip/buttocks and thigh regions), and also problems of tight fit reported at the bust line region, which integrates fit problems around the rounded upper back and the large bust. With the confirmation of the predicted fit problems, it becomes apparent that it would be unrealistic for apparel industries to continue manufacturing styles and sizes that are suitable for the hourglass body shape (fit model), and expect to fit the curvy rectangular shape appropriately. Having observed the differences between both the distinctive rectangular shapes (America's and Kenya's), it also became obvious that the body shapes indeed do differ, and that there is a need to evaluate and understand body shapes of different market segments rather than make-do with estimates. The quality of apparel regarding its fit, can only be attained collectively, through dress forms, fit models and sizing systems, which must represent the target population's sizes and body shapes (Salusso-Deonier, 1989; Ashdown *et al.*, 2004).

It can be concluded that the apparel industry's ignorance about the distinctive body shape's characteristics would lead to inappropriate design features and inappropriate fit quality strategies employed in the industry. The body shape serves as a design guide for the production of suitable styles, using appropriate fabrics and suitable sewing techniques and notions. Understanding the prevalent body shape and body features of a population in a specific market, could serve as a guide to the apparel industry's designs, fit models and dress forms for fit-testing strategies, and for distributing correct sizes and styles accurately to the marketplaces. The Western view of the hourglass body shape as ideal shape or representing all body shapes, can lead to designing and distribution of apparel that will not fit the consumers appropriately.

7.3 GENERAL CONCLUSIONS REGARDING PHASE TWO DATA

7.3.1 Conclusions concerning career women's self-perceived fit issues with the ready-made apparel in Kenya (Objective 4)

Kenya's career women consumers expressed dissatisfaction with the unavailability of appropriate styles for their sizes and shapes. The critical fit points of Kenya's career women's curvy rectangular bodies (buttocks, thighs, upper back, hollow waist, stomach, bust and non-proportional height positions) deviate significantly from the so-called ideal figure's

(hourglass) body characteristics. Consumers' dissatisfaction with the fit of ready-made apparel is further confirmed by the many reported fit problems encountered at the different critical fit points of the consumers' bodies. The reported problems of tight fit at the hip/thighs, buttocks, upper arm and bust regions also confirm the prominent buttocks, thighs, bust, upper arm and the rounded upper back regions that are common to the distinctive shape in this study. Since most of the ready-made apparel items are based on the "perfect" (hourglass) figure, the fit problems encountered by Kenya's career women are inevitable on a body shape with features that do not match the proportions of the ideal figure.

Dissatisfaction with the fit of apparel could also be attributed to frustrations encountered during an apparel search. Inadequate information given on Kenyan garment labels would likely contribute to consumers' frustrating dilemma during apparel selection. Women consumers in Kenya lack knowledge about the meaning of tacit labels and cannot comprehend and link the meaning of the labels to the given size codes and their own measurements. Although Kenya's career women perceive the fit of imported, custom-made and second-hand ready-made apparel categories as good, the actual fit of imported, custom-made and second-hand apparel could be worse than reported, as confirmed by their expressed dissatisfaction with the unavailability of appropriate styles and sizes. The personal attention and fitting processes involved while garments are constructed may result in women perceiving the fit of custom-made apparel as better. Extrinsic features such as emotional satisfaction, rather than the intrinsic (fit) aspects of apparel, may contribute to the positive perception of fit with both imported and second-hand apparel – rather than its actual fit (De Klerk & Tselepis, 2007). Kenya's career women's "ego" drive towards the imported apparel could be the main reason behind the perceived good fit (Agbonifoh & Elimimian, 1999; Hansen, 1999:359; Mhango & Niehm, 2005). In practice, the lack of a representative anthropometric database (size tables and body shapes), and the unrepresentative and uninformative communication of size and fit are the major sources of fit problems (Salusso-Deornier, 1989; Ashdown, 2000).

Significantly, Kenya's career women perceive both their body shapes and the apparel industry as the source of the fit problems, thereby confirming their state of confusion. Confusion regarding the source of the fit problems could attribute the locus of the problem externally by blaming the apparel industry, and internally by blaming their bodies in a negative way (Weiner 1986). Consumers, who are equipped with adequate knowledge about the products they are buying, are likely to link the cause of the problem to the manufacturer. Confused and unskilled consumers are less able to process information and are more vulnerable to making less than optimum apparel style and size choices.

7.3.2 Conclusions regarding Kenyan career women's knowledge about the communication of size (key body dimensions) and fit (body shapes) (Objective 5)

Although Kenya's career women preferred informative size labels, it can be concluded from this research that Kenya's career women lack knowledge about the meanings of various size descriptions that are familiar to them. They are partially knowledgeable about their bust and waist dimensions, but are more knowledgeable about their hip dimensions. Problems with tight fit reported at the regions of the hips, the buttocks and the thighs of the consumers, confirm that these regions are calling for closer attention. A consumer with a prominent hip region is likely to experience problems with tight fit, which may aggravate her desire to understand the dimensions around it. Various factors may contribute to consumers' problems with regard to the fit of their clothes and to their problems regarding the finding of suitable sizes that fit their bodies. According to Ashdown (2000), these factors may be the population's measurements, the design features, the fit issues and the communication of sizing and fit – in other words, the information that is communicated to consumers and that they can interpret and use as knowledge when purchasing apparel items. In the case of the Kenyan consumer of female apparel, the lack of knowledge (which implies that there is no meaningful communication between the apparel industry and the consumer), is probably an important contributing factor to her problems with getting the right size and her dissatisfaction with the fit of apparel.

Familiar size labels showed no significant associations with consumers' knowledge about the meaning of size labels and the age (experience) of the consumers. Being familiar with, and long experience of size labels or apparel selection, and being knowledgeable about size codes, are clearly different concepts, implying that being exposed to information in the consumer socialisation process does not automatically result in an informed consumer who has the knowledge needed when trying to make informed decisions. With this, it can be concluded that getting information and being familiar with the way that it is presented, do not automatically mean correct interpretation of the information, to the extent that it can be viewed as meaningful knowledge that can successfully be applied in a decision-making situation. It can also be concluded that, although they prefer the more informative and descriptive size labels, female Kenyan apparel consumers are familiar with most of the non-informative descriptive size labels that are currently used to indicate the sizes of most female apparel items.

As in the case of tacit labels, the apparel industries in Kenya are neglecting the recommendations by KEBS (2001:7) to use instructive labels. The lack of body shape terms

on size labels/tags would mean inappropriate apparel selection by the consumers, as they have nothing to guide them. A size label should not only indicate key dimensions but also describe the body type that the apparel item was designed for (Glock & Kunz, 1995:108; Chun-Yoon & Jasper, 1995). Although manufacturers/retailers hardly include body shape as a communication of fit, size label terms that represent body shapes were not familiar or comprehensible to Kenya's career women. This means that career women in Kenya cannot relate their own shapes to the available ready-made apparel styles. Unawareness of their own shapes could possibly indicate ignorance about the basic elements and principles of design, which would be useful in the selection of appropriate apparel styles. Kenya's career women's preference for the hourglass body shape is also a signal that they view their shapes unrealistically – and hence their inappropriate apparel selection. Consumers who are knowledgeable about their own body shapes and skilled in the application of the basic elements and principles of design, are likely to make effective selection of appropriate apparel items, while they would also express satisfaction with their body shapes. Presenting uninformative size labels to ignorant consumers on size and fit may create a state of confusion regarding the sources of fit problems and maintain their lack of skills to tackle the problems. However, if size labels were informative, then women would possibly measure themselves more carefully and perhaps get to internalise their key dimensions and understand their shapes. There was a significant relationship between consumers' professional background and their familiarity with size labels and knowledge about the meaning of body shape terms. Some of the terms used to represent body shape on the size labels were familiar to professional home scientists who also understood the terms. It must therefore be appreciated that formal education on size and fit issues could equip learners with useful knowledge.

A consumer's knowledge plays, from an expectancy disconfirmation point of view, an important role in the expectations that the consumer forms about a product, in this case apparel products. Knowledge also plays an important role when the consumer has to evaluate the apparel item at the point of purchase, and again when she wears the garment and has to decide whether she is satisfied or dissatisfied, and where the cause of the problem lies. A consumer with inadequate knowledge, in this case inadequate knowledge about sizing and fit, would not be able to make informed decisions regarding the size and fit of a garment – thus she stands a better chance to make the wrong choice. Without adequate knowledge of her own body measurements, knowledge of how a garment is sized, and an understanding of the meaning of the terms used on the size label, the consumer would also not be able to know why a garment does not fit properly and would therefore be unable to correct the problem in future purchases.

Oumlil, Williams and Oumlil (2000) underline the need for, and the value of, consumer education, and state that it can become an effective and viable tool through which marketing strategies can be implemented, to the extent that it can become a form of self-promotion and advertising. Professional background in Home Science had significant associations with consumers' knowledge on size labels and terms that represent body shape, signifying that formal education on size and fit could equip learners with useful knowledge. As suggested by Oumlil *et al.* (2000), education should be part of any company or retailer's competitive strategy, with the advantage that it would help to obtain, and keep, satisfied customers, would contribute to a favourable attitude formed amongst the consumers and would help to reduce confrontations between customers and apparel suppliers.

7.3.3 Conclusions regarding Kenyan career women's fit preferences for differently fitted apparel items in Kenya (Objective 6)

With reference to the fit preferences of Kenya's career women, it may be concluded that they prefer fitted and semi-fitted skirts and jackets. The predominant rectangular body shape of the Kenyan career women can be fitted comfortably and appealingly with more fitted apparel, if the majority of the available designs were based on this specific body type. The curvy rectangular body shape's prominent characteristics such as the large buttocks, the rounded upper back, hollow waistline, large upper arms and large bust should therefore be well understood by the apparel industry so as to cater for their preferred needs. It is also possible that consumers' fit preferences are dictated by fashion trends rather than by a knowledge of the appropriate apparel styles for their shapes or their critical fit points. Where no body shape considerations are considered while manufacturing ready-made apparel, the curvy rectangular body shape could be accommodated more comfortably and pleasingly by loosely fitted apparel as it contains enough wearing (comfort) and design (style) ease. Significantly, those who reported acceptable fit at the stomach region preferred fitted skirts, while those who reported tight fit at the thigh and bust regions preferred semi-fitted skirts and jackets, respectively. This may indicate that comfort required around the stomach, bust and thigh regions could determine the degree of ease necessary in skirt and jacket for some career women in Kenya. Fit problems encountered could therefore be ascribed to the unavailability of appropriate styles designed for the curvy rectangular shape, and inappropriate fit preferences that do not take into account consumers' curvy rectangular body shape and its critical fit points.

7.4 OVERALL CONCLUSION OF THE STUDY

The given framework (**Figure 7.3**) will be used to direct the overall conclusions drawn from this study.
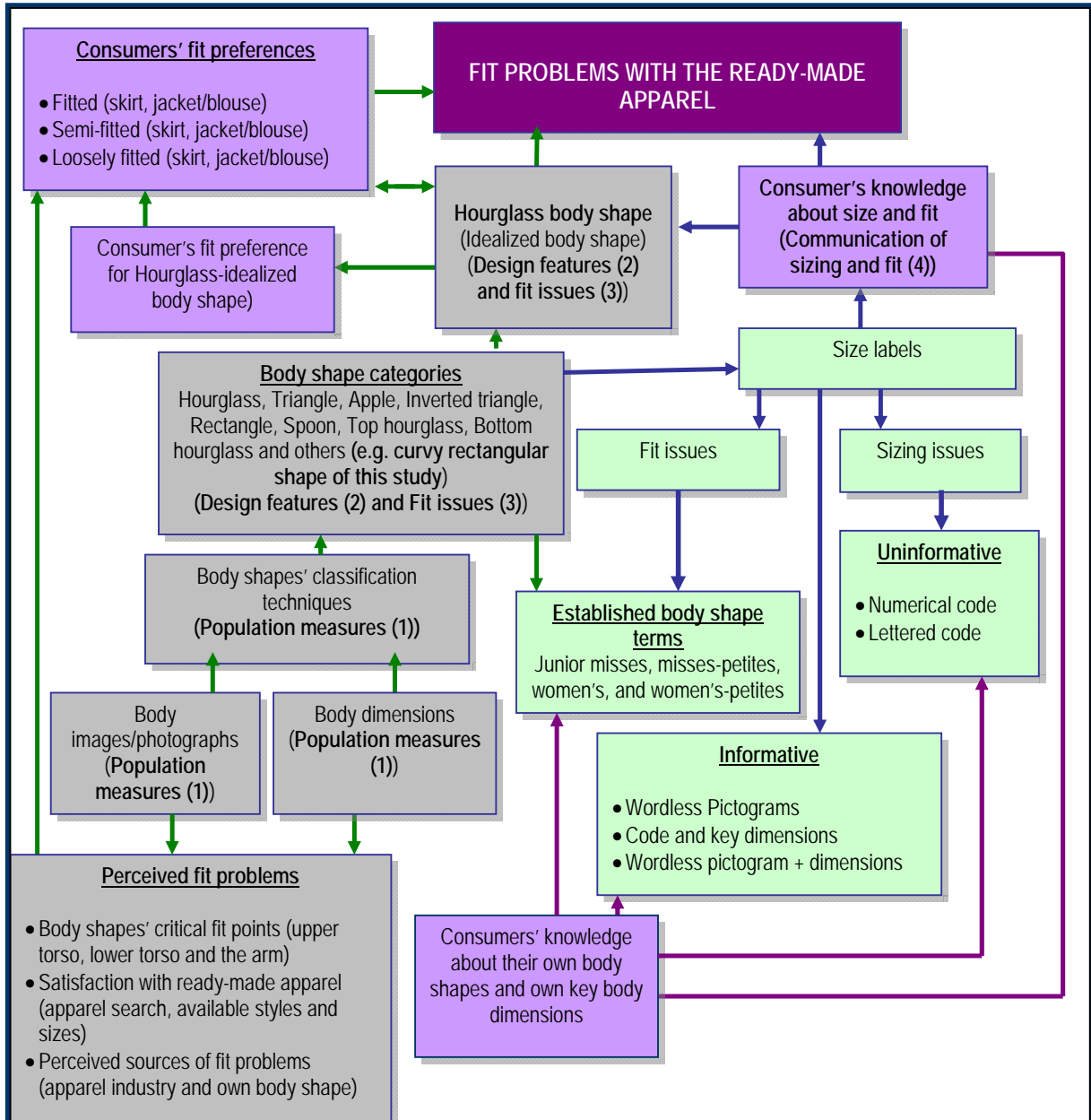
FIGURE 7:3: FACTORS THAT MAY CONTRIBUTE TO WOMEN'S DISSATISFACTION WITH THE FIT OF APPAREL

The framework (**Figure 7.3**) was developed with the theory (Ashdown, 2000), the objectives and the findings of the study in mind, and it serves as a means to understand the various

factors that contribute to women's dissatisfaction with the fit of apparel in Kenya and other parts of the world. These overall conclusions will revolve around Ashdown's (2000) model which includes four major factors, namely, population measures, design features, fit issues and communication of size and fit. Overall conclusions will also include consumers' perspective on matters that could affect apparel's size and fit, such as knowledge about communication of size and fit, preference for an hourglass body shape, fit preferences and perceived fit problems.

After the overall conclusions, it will be followed by an evaluation of the limitations and success of the quantitative research style, data collection methods, sample selection, data analysis, the quality of the study and the achievement of the objectives. The study's contribution to the existing theory is also discussed, while recommendations are made to the apparel industry (manufacturers and retailers), the government and the consumers.

7.4.1. Overall conclusions based on Ashdown's (2000) four major factors revolving around sizing systems

7.4.1.1. Population measures and the distinctive body shape

Population measurements as one of the four major components of Ashdown's (2000) model demand that the body dimensions should be obtained from the three-dimensional body in an explicit way that will facilitate body shape classifications. Accurate reflection of the three-dimensional body's characteristics would be achieved when the apparel has been made based on all the elements of fit (grain, set, line, balance and ease) and dressed on the body (Erwin *et al.*, 1979). It can be concluded that Kenya's apparel industry, as well as foreign companies that export their apparel merchandise to Kenya, do not understand Kenya's distinctive curvy rectangular female body shape, nor its representative body measurements. Most sizing systems available in Kenya do not include a classification of body shapes, which is the core component of a successful sizing system (Chun-Yoon & Jasper, 1996; Istook & Hwang, 2001). According to Kenya's sizing standards (KEBS, 2001), anthropometric data was last collected in 1975, which means it is outdated. Zwane and Magula (2006) report that most apparel industries in developing countries actually adapt western sizing systems without considering variability of body shapes and sizes that exist in their markets. Fit problem in Swaziland has also been found to be as a result of mismatch between the actual measurements of Swazi women and the key dimensions of existing size charts. As observed in this study, Swaziland women's body shapes also do not conform to the Western idealized hourglass body shape and measurements (Zwane & Magula, 2006).

A sizing system entails the assignment of body dimensions to a group of body shapes representing a market segment (Ashdown, 2000; Keiser & Garner, 2003:30; Salusso-Deonier, 2005; Petrova, 2007:57). It has been reported that a sizing system that sets out to satisfy its target market must be up to date, precise in its measurements and body shape classification (proportions) and must represent the population it was designed for (Salusso-Deonier, 1989; Delk & Casill, 1999; Schofield, *et al.*, 2006). Apparently, size and fit problems is an international outcry. Studies carried out in developed countries (USA, UK and Canada) also indicate that sizing systems used are as old as the 1940s' and 1950s'. Although national anthropometric surveys have been carried out recently in most of these developing countries, most apparel industries are still reluctant to implement the data as sizing systems and hence persistent fit problems (Newcomb & Istook, 2004a; Otieno, *et al.*, 2005; Ashdown & Dunne, 2006; Faust *et al.*, 2006; Shin & Istook, 2007).

7.4.1.2.   Design features and the distinctive body shape

Design features, being the second most important factor highlighted in Ashdown's (2000) model, necessitate that the body's framework (three-dimensional characteristics) be rightfully translated into patterns for the construction of well-fitting apparel. Lewis (2007:319) states that the body shape and the apparel silhouette worn become attached and united so that the body shape beneath the apparel enhances the aesthetic appeal of that particular apparel, while the apparel silhouette enhances the aesthetic appeal of the entire person. Considering that the body measurement tables in Kenya are based on an outdated anthropometric database in combination with a lack of classified body shapes, it is possible that sizing systems currently in use could be an adaptation of the 1975 data, borrowed or adapted from other countries. This means that apparel items available in the Kenyan markets are based on estimations rather than on facts. Body shape terms represented on the size labels are not familiar to Kenya's consumers, clearly indicating that size labels attached to the garments before being dispatched, do not indicate the body shape of the intended consumers. Without body shape as a design guide, it is possible that the styles produced are based on approximations and arbitrary distributions to the market place, thus confirming consumers' dissatisfaction with the fit of ready-made apparel.

Apparel is the product of a design process and the fabric's properties, and its quality is measured by its appearance and comfort on the body shape. The body shape functions as a frame for the apparel (Salluso-Deonier, 2005), and the fabric's properties and the apparel's style must be in harmony to produce aesthetically pleasing, comfortable and well-fitting apparel. Currently, media and apparel companies worldwide use a well proportioned but relatively slim hourglass body shape for their fashion shows and catwalks (Brown & Rice,

2001:154; Yu, 2004:33; Loker *et al.*, 2005). This is viewed in Western society as ideal (Yu, 2004:33; Zwane & Magagula, 2006; Pisut & Connell, 2007). Armstrong, (1995:33) define the ideal figure female body structure with well-balanced features. The perfect body is assumed to provide a silhouette that will fulfil everyone's desired image of perfection, but in reality it denies the consumers with diverse body shapes and sizes, the opportunity to see and understand their body structures sensibly (Lewis, 2007:319). Apparel designed, modelled and sized according to this idealized body shape would certainly not fit consumers with varied body shapes and sizes. As earlier mentioned the reluctance by most apparel industries to implement anthropometric data into useful sizing systems, size and fit problems inevitably continues to bother consumers irrespective of regions and countries.

7.4.1.3.   Fit issues and the distinctive body shape

The fit issues being the third important part of Ashdown's (2000) model involve fit quality management strategies that call for certain fit testing techniques such as the use of fit models and dress forms. Fit is the apparel's silhouette and size, and these have to be right for the humans' body shapes and dimensions (Kadolph, 1998:550; Keiser & Garner, 2003:315; Solomon & Rabolt, 2004:196). Therefore, the fit models and/or the dress forms used for fit testing must conform to the body characteristics of the distinctive figures and sizes of the target market. It may be concluded therefore that, without representative body measurements or an identified body shape, it would be almost impossible to formulate and administer fit quality strategies.

Representative anthropometric data and identification of distinctive body shapes of any specific target market form the foundation of the successful production and distribution of ready-made apparel. Understanding prominent body characteristics of a prevalent body shape plays an important role in the production and distribution of appropriate and correct numbers of apparel styles and sizes to a specific marketplace. The body shape serves as a design guide for the pattern development and consequently, well fitting apparel. It is therefore critical to analyse and understand the body proportions of the dominant shape in any country rather than the assumptions that all shapes are ideal (Hourglass), as these determine the overall design values that can be incorporated into garment production, the development and implementation of quality assurance measures right from illustration stage (style decision), pattern creation, fabric selection and dispatch.

7.4.1.4. Communication of sizing and fit, the distinctive body shape and the key body dimensions

Communication of sizing and fit, being the fourth important factor in Ashdown's (2000) model, requires that measurements and body shapes indicated on the size labels reflect the true picture of the target market (population). The garments made in the industry require that body measurements be translated from a body measurement table into patterns, and finally into garments. Size labels are attached to the garments whilst in the assembly process. The information given on the labels must therefore reflect the correct original dimensions and body shape that they purport to represent. Failing this, the apparel item will land on consumers whose dimensions and body shapes differ – hence, fit problems.

It can be concluded that uninformative size labels are presented on Kenya's ready-made apparel – labels that are not instructive and cannot be useful during garment selection. Although Kenya's female consumers prefer the more informative, descriptive size labels, the uninformative size labels are familiar to them. Istook (2002:65) highlights the importance for manufacturers to communicate to their consumers, how each apparel item was designed to fit. This communication is an indispensable step in meeting the fit expectations of consumers. Misleading information often leads to consumers' confusion, which can affect the quality of consumers' purchase decisions (Mitchell & Papavassiliou, 1999). Continuous presentation of the uninformative labels in Kenya may be viewed as deliberate refusal by the apparel industry to adhere to the recommendations by KEBS (2001:7). Also observed in Canada (Faust *et al.*, 2006), USA (Newcomb & Istook, 2005; Shin & Istook, 2007) and Swaziland (Zwane & Magagula, 2006), apparel industries do not adhere to measurements assigned to the recommended size codes.

The lack of body shape terms on size labels/tags would mean inappropriate apparel selection by the consumers, as they have nothing to guide them. A size label should not only indicate the key dimensions but also a description of the body type that the apparel item was designed for (Glock & Kunz, 1995:108; Chun-Yoon & Jasper, 1995). Consumers have a right to clear and understandable information regarding the product that they are buying, and this should appear on the product itself. It is therefore advisable for the apparel retailers to clearly indicate the body dimensions and body shapes of their target consumers and to ensure that size labels attached to the garments are communicating the correct information effectively. In other words, there must be a plausible relationship between anthropometric data, the size charts and the sizes presented on the apparel. Informative size labels based on representative anthropometric data inform the consumer about the dimensions used, and about the body shape that the apparel will fit best. In conclusion therefore, obsolete sizing

systems and ignorance about the prevalent body shape in Kenya are leading to the use of vague size labels that do not only confuse the consumers, but also do not represent their true measurements and body shapes.

Variations that exist between apparel sized with the same codes from one company or different companies could be traced to the use of obsolete and/or wrong measurements, either initiated by the manufacturer or the retailer. Methods of obtaining body dimensions are not standardised amongst stakeholders (manufacturers and retailers), thereby creating leeway for most apparel industries (manufacturer/retailer) not to adhere to the suggested (voluntary) standard size communication systems (Faust *et al.*, 2006). The pattern development, grading, fabric spreading, cutting and assembling procedures employed by different manufactures are inconsistent, resulting in confusing sizing systems in the marketplace (Hudson, 1980:112; Solinger, 1988:128; Brown, 1992:29; Glock & Kunz, 1995:390). Failure of quality control measures due to lack of guidance provided by representative size tables and body shapes could easily permit errors to slip through from one section of apparel processing to the other, ending up in consumers' hands in a retail environment.

It is clearly the responsibility of the retailer and the manufacturer collectively to work together in ensuring that body shapes and body dimensions used in the construction of the apparel, are effectively communicated through size labels to the consumers. Retailers are direct customers of the manufacturers, as they provide size and style specifications to the manufacturers. Manufacturers have the responsibility of producing the apparel as per these specifications. Since retailers are the order initiators, they are required to give size and style specifications based on accurate shapes and sizes of the target market.

7.4.2   Overall conclusions based on Consumers' perspective regarding matters that could affect apparel's size and fit

7.4.2.1   Consumer's lack of knowledge about the communication of sizing and fit

It can be concluded from this research that female Kenyan apparel consumers lack knowledge of their own and different body shapes, the meanings of various size descriptions used on labels, and also lack knowledge of their own key body dimensions which serve as indicators of appropriate sizes. Various factors may contribute to consumers' problems with regard to the fit of their clothes and to their problems regarding the finding of suitable sizes that fit their bodies. According to Ashdown (2000), one of the factors affecting size and fit is the communication of sizing and fit – in other words, the information that is communicated to

consumers that they can interpret and use as knowledge when purchasing apparel items. Workman (1991), Desmarteau (2000) and Brown and Rice (2001) underline the importance of consumers' knowledge of their own measurements, and of which body measurements are necessary when choosing certain garments. In the case of the Kenyan female apparel consumer, the lack of knowledge (which implies that there is no meaningful communication between the apparel industry and the consumer) is probably an important contributing factor to her problems with getting the right size and also her dissatisfaction with the fit of clothes.

7.4.2.2   Consumers' preference for an hourglass body shape

The body, as frame structure for proportioning apparel, must be well understood by the user in terms of shape and proportions. A consumer without knowledge could assume that all people have bodies similar to that of the fit model or to that of the perceived ideal shape. Career women consumers in Kenya perceive the hourglass body shape as ideal, and as a reflection of their own body shapes; therefore they select apparel styles that are suitable for the hourglass body shape. They are not only uninformed about their own and others shapes, but are also unrealistic about their own shapes. Unrealistic perception of the self could lead to purchasing apparel suitable for the fit model or for the perceived ideal shape – rather than for the own actual body shape. Consumers who are unaware about the different body shapes are likely to also be ignorant about the elements of good fit, and hence will select apparel based on other factors such as colour, style and current fashion, eventually purchasing apparel with fit problems. Knowledge about the different body shapes facilitates a comparison of the proportions between different body shapes, which ultimately eases apparel selection.

7.4.2.3   Consumers' fit preferences

The study has shown that Kenya's career women prefer fitted and semi-fitted skirts and jackets. This could be influenced by fashion trends rather than the comfort needed from fashionable apparel, as confirmed by the selection of styles that are suitable for the hourglass shape (fit model) rather than for their actual shapes. Physical (aesthetic) characteristics or emotional experience that the consumers expect or get from purchasing certain apparel may also contribute to a preference for a certain degree of fit in specific apparel (Pisut & Connell, 2007; De Klerk & Tselepis, 2007). If the available designs were based on the curvy rectangular body shape's prominent characteristics, the consumer's preferred fit needs would be catered for. In this respect, problems encountered at the critical fit points would be attributed to inappropriate fit preferences that do not consider the distinctive body shape's critical fit points. Consumers' lack of knowledge about the

appropriate degree of fit required in any apparel style, and the basic elements and principles of design applicable for different body shapes could also lead to inappropriate fit preferences – and consequently, fit problems.

7.4.2.4   Consumers' perceived fit problems

It may be concluded that Kenyan career women perceived fit of the imported new and second-hand ready-made apparel as good, although they are generally dissatisfied with the way the ready-made apparel items fit their critical fit points. The Majority of the career women, however, report more problems with either tight or loose fit than they report acceptable fit at the various fit points of the upper and the lower torsos. Consumers' dissatisfaction confirms the fact that the distinctive Kenyan female body shape (curvy rectangle) in deed differs, not only from the idealised ideal hourglass figure, but also the western rectangle figure (Newcomb & Istook, 2004a & 2004b; Zwane & Magagula, 2006). As reported by Kurt Salmon Associates (1996) in the United States of America, Otieno *et al.* (2005) in the United Kingdom and Faust *et al.* (2006) in Canada, it appears therefore that consumers' dissatisfaction with apparel's fit is becoming a global problem.

As observed through out this study, fit problems arise from:

- Lack of distinctive body shape and body dimensions necessary for designing and distributing appropriate styles and sizes to a specific market from which the shapes and sizes were obtained
- Use of uninformative size labels presented on garments, which are not understood and not preferred by the consumers
- Consumers' lack of knowledge – not only about the size codes, but also about their dimensions and body shapes, and therefore they will make the inappropriate apparel selection
- Inappropriate style choices based on the perceived ideal figure rather than on the actual body shape
- Consumers' lack of knowledge about the appropriate degree of fit required in any apparel style, and about the basic elements and principles of design applicable for different body shapes, and their inappropriate fit preferences that do not consider a distinctive body shape's critical fit points

7.4.2.5.   **Consumer's perceived sources of fit problems**

Kenya's career women are confused about the source of fit problems, so they attribute the locus of the problem externally by blaming the apparel industry, and internally by blaming their bodies in a negative way (Weiner, 1986). Informed consumers with adequate knowledge about the products they buy are likely to link the cause of the problem to the manufacturer. Confused consumers are less able to process information and are more vulnerable to making less than optimum apparel style and size choices. As female consumers continuously purchase substandard apparel fostered by their state of confusion, they could get emotionally distressed, incur financial losses and be exploited by the apparel industry (Mitchell & Papavassiliou, 1999). A consumer who believes that the manufacturer or retailer is responsible for the fit problem would probably direct negative emotions to the apparel industry. This also has negative consequences for the manufacturer because the consumer would probably engage in negative post-purchase complaint behaviour, such as boycotting the retailer, switching to another brand and even telling friends (Laufer, 2002).

7.5   EVALUATION OF THE STUDY

Evaluation is necessary for the purposes of follow-up and could serve as a guideline for similar future studies. This study is hereby evaluated in terms of the quantitative research style (sample selection, data collection and data analysis), the quality of the data and the achievement of the objectives.

7.5.1   Research strategy

*Phase one***:** Generally speaking, this study was exploratory and descriptive in nature because researching body shape, size and fit issues is new in Kenya. In quantitative research, reliability is exceedingly important, objective facts are measured with the emphasis placed on certain variables. The research has to be value-free, independent of the context and the researcher has to be detached, thus enhancing the objectivity of the study. In this phase of the study, the aim was to identify and describe Kenya's career women's distinctive body shapes from body dimensions and photographs, distinguishing how they differ from the Western distinctive body shapes, and to analyse the fit problems associated with those shapes.

This part of the study focused on the variables contained in the body dimensions form (**Appendix 3A**), and the body assessment scale (**Appendix 3D**), for purposes of identifying

and describing a distinctive Kenyan career women's body shape. According to Neumann (2000:126), variables are central to quantitative research; these variables were identified in the literature (anthropometric studies, standards and body shape assessment training manual), and measured by using relative dimensions and indicators presented in the body dimensional form and body shape assessment scales. The quantitative research style ensured that the researcher was objective when analysing the distinctive body shape and distinct body features. The body dimensions, according to the body measurement form, were much more than required for identification of the body shape. It took a long time to obtain accurate measurements – exhausting the participants as well as the measurer. It would be recommended that photographs be taken first as a prerequisite step for the key body dimensions. A thorough scrutiny of the photographs will serve as a guide for the necessary elements required for the study. Expert evaluators could be involved in the decision-making process of identifying and sorting out only the essential key dimensions.

Phase two: The second phase of the study employed a quantitative research style, focusing on the variables obtained from the fit problems of apparel, the communication of size and fit, and fit preferences. A structured questionnaire was used to get the broader picture of the respondents' perceived fit problems, their knowledge about the communication of size and fit, as well as their fit preferences for differently fitted apparel items. The questionnaire measured specific dimensions of apparel fit problems, communication of size and fit, as well as fit preferences, as explained in the literature review (**Chapters 2** and **3**), and clearly indicated in a schematic framework (**Figure 3.24**). The questionnaire measured objective aspects, for instance, rating the fit of different apparel categories in Kenya, reporting fit problems experienced at critical fit points of the body, and reporting the meaning of size codes. Questions relating to consumers' knowledge about terms used on size labels, representing different body shapes, and consumers' fit preferences for differently fitted skirts and jackets were asked. This part of the study focused on the variables obtained from apparel's fit problems, the communication of size and fit and fit preferences. According to Neumann (2000:126), variables are central to quantitative research, which were identified in the literature (Ashdown's model (**Figure 2.1**) and the schematic framework (**Figure 3.24**)). These variables were measured by using relative dimensions and indicators and were presented in a language that was more comprehensible to the respondents.

Being an exploratory study, a structured self-administered questionnaire was the best option as respondents could complete it without any outside influence. The researcher and/or research assistant could solve unclear issues arising from the questionnaire. Although the researcher and the assistant were available, some of the questions were left unanswered. The respondents felt that some questions were too long. This method can be time-

consuming to initiate, but meaningful information can be acquired from many respondents in a relatively shorter time if the questionnaire is much shorter.

7.5.1.1 Choice of the research sample for the study

Initially, probability-sampling techniques were used for both phases of the study, but due to the sensitive nature of phase one data, non-probability sampling (snowball technique) emerged within the already probability-sampled group (see paragraph 4.5.5).

Phase one: Although it is recommended that the sample size for a quantitative research study should be representative of the entire population (Mouton, 1996:136; Wimmer & Domnick, 2000: 94), non-probability sampling techniques could be used in a preliminary or pilot study. In such instance the results cannot be generalised to a larger population, but should rather be viewed as indicative of the specific group tested (Wimmer & Domnick, 2000:82-83). Although the intended sample size for phase one was 301, 123 and 89 participants were measured and photographed respectively. The smaller number of participants in this study can be attributed to the sensitive nature of obtaining body dimensions and photographs from women who are almost nude. These smaller numbers were reached through persistent negotiations and persuading the participants (see **Chapter 4, paragraph 4.4.5.**). The snowball sampling method applied was considered to be adequate. Non-probability sampling techniques will still be applicable for any follow-up studies of this nature, since taking body measurements and photographs are manually executed and remain sensitive. Given adequate time, skills, funds and the use of body scan technology, it is possible that probability-sampling techniques could be applied with a larger sample. A feasibility study on the acceptance of body scan technology should be carried out while socio-cultural issues of the target market need to be understood and considered (Fiore & Kimle, 1997:86; Marshal *et al.*, 2004:94).

Phase two: The second phase of this study, which involved the use of a questionnaire, had 201 (67% of the initial 301 sample size) respondents. The sample size was selected using probability sampling techniques and hence was thought to be adequate for data analysis.

7.5.1.2 The choice and application of the data collection techniques

Since willing respondents increase the reliability of the study, as observed by Mouton (1996:145), no respondents were forced to take part in the study. A research permit from Kenya's Ministry of Education was shown to the gatekeepers (Head teachers) as well as the participants at every school visited. The researcher further explained the aim and importance

of the study to the gatekeepers as well as the participants before commencing the fieldwork. Appropriate ethical measures were taken to ensure that participants' rights were not violated in any manner.

Phase one: Before the research commenced**,** the researcher consulted professional anthropometrists from the Company of Ergonomic Technologies (Ergotech), South Africa, for training in body measuring techniques, particularly in identifying and locating landmarks on the body, and how to take the measurements accurately. The training was based on the standardised anthropometric measuring techniques using appropriate, recommended measuring instruments (Beazley, 1996; ISO, 1990; RMSS, 1994-Ergotech). The researcher completed an Anthropometry Accreditation Course (AAC) – level one (**Appendix 3C**). The course consisted of both theory and practical sessions on landmarking and measuring the human body. The techniques used were based on the International Standards for Anthropometric Assessment (ISAK, 2001). The measurements selected for the study were carefully prepared (after consultation with various professionals in the field of apparel, namely study leaders and Ergotech experts, and consulting relevant literature and different anthropometric standards). Traditional anthropometric measurements have been used in many studies (as stipulated in most sizing standards), ensuring reliability and validity of the studies (Winks, 1997; Beazley, 1998; Simmons & Istook, 2003). The same approach was adopted in this study, strengthening its reliability and validity. Instruments that were used, such as the standing anthropometer, underwent quality testing and were recommended by the anthropometrist.

A specific literature search on anthropometric studies and female body shapes was done. This enabled the researcher to develop a comprehensive body measurement form and body shape assessment scale for the purposes of data collection. As stated earlier, it was difficult to take body dimensions and photographs of career women in minimal clothing. In their reluctance to participate in the study, they cited cultural and religious beliefs as their main concern. Continuous persuasion, negotiations and even the use of incentives were sometimes used to convince participants to participate in the exercise. The body dimensions form, and the policies laid down for the purposes of photographing, were subjected to rigorous scrutiny by both study leaders before the fieldwork commenced. That enhanced the reliability and validity of the study. The body shape assessment scale was also developed based on a thorough literature review and after scrutinising the photographs. It was peer-reviewed by professional experts in the field of apparel design to ensure that evaluations made on the body shapes were valid and reliable.

Before commencement of the fieldwork, the researcher also underwent photography training, which was administered by a professional photographer. To obtain reliable photographs for the purposes of identifying and describing the distinctive body shapes of the Kenyan career women, participants were photographed using standardised methods while dressed in minimal apparel (body suits/leotards), and assuming/taking different positions/views (front, back and side/profile). The use of an assessment scale with well-defined variables (body shapes and distinct features) facilitated proficient judgements on the overall body shape and body units/components that are critical to the fit of apparel (Gazzuolo *et al.*, 1992; Kuma, 1999:39; Anderson *et al.*, 2001; Ashdown, Loker & Adelson, 2004). It was very difficult to keep the participants still in their posture while photographing, which forced the researcher/photographer to operate between focusing the camera and helping the participants to keep them motionless before photographing them. These movements could be reduced with automated photographing, if a studio setting was stationed with all the equipment placed in a booth. The body dimensions obtained and the evaluations made with the use of the body shape assessment scale were seen as relevant and reliable. All the body dimensions that were taken were recorded, while trained professional experts guided by the body shape assessment scale, adequately did the evaluations of the photographs.

Phase two: Theoretical clarity and descriptions of relevant aspects that were identified through the literature search, helped to recognise appropriate measures to facilitate the development of a comprehensive questionnaire covering all concepts of the study. Some questions that had previously been used in related research were adapted in this study. Questions that aimed at measuring consumers' satisfaction with fit had been used by LaBat (1989), Kurt Salmon Associates (1996) and Otieno *et al.* (2005). Measurement of consumers' fit preferences and self-reporting of key body dimensions had been used by Anderson *et al.* (2001) and Alexander *et a*l. (2005). The questionnaire's top page had the University of Pretoria's logo (letterhead) and an introductory letter stating the purpose of the research, giving an assurance of anonymity, an appeal to participate in the study and an acknowledgement of participation.

Before the research commenced, the questionnaire had been scrutinised by the researcher's study-leader, the co-study leader, a statistician and the subject specialised lecturers at the Department of Consumer Science, University of Pretoria (peer evaluation). The questionnaire was also pilot-tested on twenty third-year students enrolled for Apparel Management at the University of Pretoria, and while in the field (in Kenya), the questionnaire was further pilot-tested on 10 career women to enhance its quality and reliability. Except for two questions (questions 11 and 22) that were answered poorly, the questions were all relevant. The participants reported that the two questions were too long. The theory

(literature) used helped the researcher to understand and describe the emerging distinct body shapes and certain characteristics emerging from the objectives highlighted in the questionnaire.

7.5.1.3 Choice of statistical methods employed

The data was analysed using acknowledged statistical tests that were chosen after examining the body dimensions obtained, the body shape assessment scale and the questionnaire. The number of variables involved the measurement scales that were used, and the nature of relations between variables (Agburu, 2001:85). Statistics were used to investigate whether distributions of categorical variables differed from one another. The statistical analysis of data, a characteristic of quantitative research, was adequate for the study. In some cases, hypotheses were tested, while in others, hypotheses could not be tested due to the fact that there were sparse cells in some categories (**Chapter 4, paragraph 4.6 (Tables 4.3 and 4.4)**). Hypothesis testing was done at the 5% level of significance. The statistical methods used and the boundaries set at the 5% level of significance by specific statistical tests, helped the researcher to determine when the results were statistically significant. The research problem was solved when logical deductions, derived from the theory, were linked to concrete evidence obtained from the results.

Phase one: The selection of appropriate drop values (from the body dimensions) and the statistical methods used for identification of the body shapes were based on a thorough literature review, and hence considered reliable, as they had been applied in other similar studies (Beazley, 1997; Winks, 1997; Gupta & Gagandhar, 2004). The body dimensions were summarised by the use of descriptive statistics, thereby enabling comparison across the variables (Trochim, 2005:212). Range values measured the dispersion of variables, while the mean values measured the central tendencies of variables. The standard deviation used in conjunction with the mean value reflected the degree to which the values in a distribution differed from the mean, thereby facilitating categorisation of variables such as large bust, medium bust and small bust or short, medium and tall (Bryman & Cramer, 1997:85; Bryman & Bell, 2007:359-360). The distinctive curvy rectangular shape emerged from the study as the dominant body shape, as it had the highest representation from the measurements (74%) and photographs (70%).

Assessments from the trained professional evaluators were also subjected to inter-rater reliability tests (Kappa), for the purposes of analysing the strength of agreement between different evaluators. This was to further enhance the reliability of this study (Ashdown & DeLong, 1995; Landis & Koch, 1977). Statistical analysis of the body measurements

alongside expert evaluations of the photographs produced almost identical results, which enhanced the triangulation of phase one data, and ensured that the results were reliable.

Phase two: The approach of the study was judged successful because the researcher conducted a thorough literature search on specific concepts of the study that guided the researcher to make logical deductions and develop appropriate measurement scales. The first step was to define the concepts that were to be measured, and then potential scale items were created to determine indicators around the fit of apparel, knowledge about the communication of size and fit, and fit preferences. The questionnaire measurement scales included nominal (yes or no) type questions and categorical (Likert-type) scales that directed the decision to use specific statistical methods. Chi-Square statistics were used to investigate the disparity of categorical variables between two independent groups, such as comparing size and fit knowledge between Home Science professionals and non-professionals. Pearson's correlation coefficient was used to measure the degree or extent of relationship between variables such as consumers' self-reported key body dimensions versus their actual key dimensions.

7.5.2   Quality of the data

7.5.2.1 Quality of phase one data (body dimensions and photographs)

As part of preparation for the research, the researcher consulted a professional anthropometrist, undertook training in anthropometric studies and did a short course in photography. Instruments used for obtaining measurements and techniques recommended by international standards were observed, as discussed in **Chapter 4** (**paragraph 4.5.1.1**). Standardised photographing setting and guiding principles were also observed, as explained in **Chapter 4** (**Paragraph 4.5.1.1 (Figure 4.6**).

The researcher also selected and screened the professional evaluators for the purposes of evaluating the body shapes based on their long-term professional skills and experience, thereby ensuring the trustworthiness of the outcome of the study. A comprehensive training manual and assessment scale were compiled based on an extensive literature search, and a thorough study and scrutinising of field photos. The training manual and assessment scale were tested and subjected to experts' assessment prior to their implementation in this study. Statistical analysis of body measurements alongside expert evaluations of photographs produced almost identical results, thus enhancing the triangulation of phase one data.

7.5.2.2 Quality of phase-two data (Questionnaire)

Validity: In order to ensure that each measurement accurately reflected the concept it intended to measure (measurement validity), the following different types of validity were observed in the questionnaire instrument:

- **Face validity:** The instruments were pre-tested by a group of experts and were also pilot-tested on third-year apparel design students and a small group of career women in Kenya. This was to ensure that the measurement instruments actually measured what they purported to measure. Only instruments purporting to measure fit issues of women's ready-made apparel, the communication of sizing and fit, and fit preferences were used.

- **Content validity:** To ensure content validity, all the concepts presented in the conceptual framework (**Figure 3.24**) were specified in a construct definition. This facilitated the development of indicators (questions and statements) from all the parts of the definitions (relating to the objectives of the study), as recommended by Neumann (2000:142-143) and Babbie and Mouton (2001: 122-123).

- **Criterion validity:** Being the pilot study, there was no standardised criterion known to measure the construct validity accurately, to permit comparison with the measurements for this study. However, some of the questions that had been used successfully in related studies were adapted for this study.

- **Construct validity:** To determine the degree to which instruments used for this study, successfully measured the theoretical construct they were intended to measure, definitions with clearly specified conceptual boundaries were provided (**Figure 3.24** and **Table 4.1**), in order to isolate the convergent validity. Evidence obtained from the results that link to the theory indicates the degree to which the instruments were successful.

Reliability: According to Neumann (2000:164), reliability is an indicator of dependability or consistency. It indicates the likelihood that a given measurement technique will repeatedly yield the same description of a given phenomenon (Mouton, 1996:144). In this study, the following strategies were applied to ensure reliability:

- The questions used in the questionnaire were predominantly closed questions. Some of them had been previously used in related studies.

- The questionnaire was pre-tested by a group of experts and pilot-tested on career women.

- A research permit from Kenya's Ministry of Education was obtained (**Appendix 1C**, while the questionnaire's top page had the University of Pretoria's logo (letterhead)

and an introductory letter stating the purpose of the research.

- Well-established methods of data collection were used and standard statistical coding methods were also applied.
- Hypothesis testing was done at the 5% level of significance.
- A non-probability sampling technique (snowball) was used in this study. It used a smaller sample size, but this technique is acceptable in this case because it is a preliminary study and Kenya's career women were difficult to access due to the sensitive nature of the study (**Chapter 4, paragraph 4.4.2**). The results therefore are indicative of Kenya's career women in the western (Eldoret and Kisumu) and central (Nairobi) regions.

7.5.3   Achievement of the objectives of the study

In order to solve the research problem stated in **Chapter 1**, primary objectives and sub-objectives were set for the study. Each primary objective and concomitant sub-objectives were addressed in the body dimensions form, the body shape assessment scale and the questionnaire used in the study. The results indicate that valuable data related to the primary objectives and sub-objectives was collected. The data enabled the researcher to interpret the results and draw conclusions related to the different objectives. The results, their interpretation and eventually the conclusions drawn also made it possible to make recommendations to the apparel industry as the manufacturers and marketers of ready-made apparel, and to governmental agencies and private consumer-oriented organisations as service providers (consumer rights activists), so as to serve effectively the needs of the career women segment in Kenya.

From the discussion and interpretation of the results, general conclusions and overall conclusions (**Figure 7.3**), it is evident that the researcher successfully achieved the primary objectives and sub-objectives stated. Information that was obtained from the results can contribute to the existing theory on issues around apparel sizing and fit, the relevant research methodology and consumer education theory.

7.6   THE CONTRIBUTIONS OF THE STUDY TO EXISTING THEORY

The value of the quantitative research style used in this study is that it enables the researcher to quantify the data and to link the data to the specific concepts used in the study. The value of research can be increased when the results are meaningfully linked to the

concepts of the established theory related to the research. The findings of this study can contribute to theory in the following fields:

- the theory of fit
- Ashdown's sizing systems theory
- the theory of size labels
- research methodology theory
- consumer education theory

7.6.1 The theory of fit

Dissatisfaction with apparel's fit is one of the most frequently stated problems with garment purchases. Women have been reported to be the most dissatisfied consumers (DeLong *et al.*, 1993; Otieno *et al.*, 2005; Alexander *et al.*, 2005). Body shape is a framework for proportioning apparel (Salusso-Deonier, 2005). This study confirms that different markets have different body shapes and unique characteristics that affect the fit of apparel. Therefore, researchers and apparel manufacturers – upon understanding prevalent and unique body characteristics – should develop sizing systems that can address the fit problems of different markets.

Issues of pattern and garment alterations could improve as design values required for different body shapes are developed. It would, for example, enable manufacturers to understand and identify the underlying factors between the standard (hourglass) body shape's hip or buttocks size and the prevalent body shape in any market environment. Also, relating fit models and dress stands to the dominant body shape in a specific market and ensuring that fit tests are carried out, would be a vast improvement.

7.6.2 Ashdown's sizing systems theory

Ashdown (2000) sees sizing systems as the focus around which all the other factors concerning sizing and fit evolve. She has identified the main factors affecting sizing systems and consequently the fit of ready-made apparel to be: the population measurements (body measurements), the design features (construction of the apparel), the fit issues (fit quality management), and the communication of sizing and fit (size labelling). This study has identified specifically body shape as another important component affecting fit. The body shape should stand out as one of the major factors revolving around sizing systems, in the same way that population measurements stand out. It could also feature under population measures, pointing out both the body measurements and body shape as the core

components. As mentioned throughout this study, population measurements, as one of the factors highlighted in Ashdown's (2000) model, require that the three-dimensional body (shape) be accurately measured for the purposes of developing size tables and classification of body shapes, which must serve as guides for design, pattern and apparel development. The design features being the second most important aspect in Ashdown's (2000) model involve using the body shape for design, style development and correct distribution of styles to the correct market. The fit, as a third important factor, demands that the body shape characteristics are understood for the purposes of formulating quality assurance strategies, such as identifying fit models representing prevalent shapes in a market, identifying appropriate dress forms for fit testing and draping. Communication of sizing and fit being the fourth component in Ashdown's (2000) model, it demands that the sizes and body shapes communicated should represent the actual measurements and the body shapes.

7.6.3 Theory of size labels

Chun-Yoon and Jasper (1996) and Glock and Kunz (1995) state that a size label is a tool that should not only indicate the dimensions it was sized for, but should also describe the body type that the garment was designed for. This study realised that familiar information on size labels were tacit and less preferred by consumers as a means of size communication. For the female Kenyan apparel consumer, being familiar with something and having knowledge about something are clearly two different things. The implication is that being exposed to information in the consumer socialisation process does not automatically result in an informed consumer with the knowledge that is needed when trying to make informed decisions.

Consumers have a right to clear and understandable information regarding what they are buying, and preferably such information should appear on the product itself. It is therefore not only about who is to be blamed for consumers' lack of knowledge about important sizing and fit issues or their misinterpretation of current labelling systems, but also what the types of size labels are presenting to the consumer. Consumers prefer instructive size labels, but ironically, existing sizing systems are not only non-standardised and vague, but also do not make sense to the consumers. The addition to this theory is to highlight that size labels, whether informative or non-informative, first must be representative of the target market, and secondly, should be understood by the consumers. The apparel industries in any marketplace should focus not only on presenting consumers with information, but on assisting them to understand the information, and providing them with the skills to utilise the information.

7.6.4   Research methodology theory

In this study, body assessments were done through visual sensory evaluations done in five different steps. Sensory evaluation is the assessment using a human's good judgement or the sensitivity of human senses, which implies the evaluation of selected characteristics of a product under controlled conditions by a panel of judges (ASTM, 1981:3; Leibowitz & Post 1982:4; Lyon, Menneer, McEwan, Metheringaham & Lallemand, 2000:1). In this regard, this study has contributed to the existing sensory evaluation theory in that the techniques devised in this study provided an orderly framework to evaluate perceived physical characteristics within different body shapes.

From the raw photographs, it was almost impossible to extract all the details as exhaustively as possible, and therefore the researcher formulated unique methods that eased the process of evaluation. Microsoft Office tools photo editor made it possible to get an edged shape (**Figure 4.10** in **Chapter 4**) from the photo negatives (obtained by right-clicking on an icon in a left-hand corner of the photo). The resulting body shapes and body features had clearer outlines, which permitted more auxiliary scrutiny. The IGRAFX Designer 5 software was used to extract only the pre-determined/-identified and important characteristics from the photos, making the assessment of the photos even clearer.

The body shape identification technique, using both body measurements and assessments of photos, can be viewed as more reliable, as it enhances the triangulation of the study. Anthropometric studies uses standardised methods and instruments, which can sometimes be unavailable due to various reasons. This study used an improvised and quality-tested, standing anthropometer for all the height measurements (**Figures 4.4** and **4.5**). The photographing studio setting (**paragraph 4.6**), and the rules set for the photographing were uniquely designed for this study. Obtaining bust extension and buttocks extension measurements, for example, were exceptional for this study.

7.6.5   Consumer education theory

According to Yeatts *et al.* (1992), in order to use a product effectively, consumers must have knowledge of the products and the intent to use them. Apparel marketers and public agency directors can educate career women in the areas of sizing and fit so that they could select appropriately fitting apparel items. Career women consumers in particular, would have potentially much to gain from well-orchestrated consumer education efforts jointly endorsed by all the concerned parties (apparel marketers, government agencies as well as consumer-oriented organisations). Consumer education programmes can provide significant benefits,

including identification of market information, complaint and consumer redress procedures, and understanding a more technology-based consumer environment (Oumlil & Williams, 2000).

It was evident in this study that the career women in the group lacked knowledge about size and fit. Skills in identifying body shapes, size labels' contents as well as key dimensions to identify a size would help consumers to be perceptive about size and fit issues and hence save time spent on apparel selection. Loker *et al*. (2005) observed that participants were able to give accurate dimensions when instructions on how to take body measurements were given as opposed to when instructions were not provided. Consumer education and counselling programmes may also include information about and referral services for wardrobe planning, wardrobe management and strategies for dressing different female body shapes. Advantages of viewing consumer education as part of a competitive strategy has been seen to help retailers obtain and keep satisfied customers, contribute to the favourable attitude formed among consumers toward a product or company, and to help reduce confrontations with consumer advocates.

7.7   GENERAL RECOMMENDATIONS

Although the conclusions made in this study cannot be generalised to a broad population, certain recommendations can be made at this stage to:
- the ready-made apparel marketers (industry) in Kenya and the foreign companies that export their apparel items to Kenya
- government agencies such as the Kenya Bureau of Standards as well as consumer-oriented organisations

7.7.1   The ready-made apparel industry (manufacturers and retailers)

Apparel designers must distinguish how the Kenyan career women's curvy rectangular shape differs from the Western rectangular body shape, and furthermore, how it deviates from the so-called ideal (hourglass) body shape. Understanding the underlying differences in body shape could help designers to translate the distinct body characteristics of the curvy rectangular shape into better-fitting apparel items for the Kenyan career women. Fit models as well as dress forms chosen for fit testing and modelling in the apparel industry, should reflect the characteristics of the prevalent curvy rectangular shape. It could also be recommended that apparel manufacturers adjust their current sizing systems to cater for the Kenyan career women's distinctive curvy rectangular body shape, rather than continue with

the production of inappropriate apparel meant for the ideal (hourglass) shape. Although this was a study in Kenya, it may be reasoned that most developing African nations lack a classification of their body shapes and therefore experience challenges with apparel fit. A country such as South Africa with people of diverse cultures also needs to follow the example set out in this study.

It is further recommended that apparel industries in Kenya and other developing nations ensure that their sizing systems are representative of their target populations' sizes and body shapes. This could be updated through collecting anthropometric data from their target markets, or adapting their existing size systems to suit their consumers' sizes and body shapes. They should also ensure that size labels used are in accordance with consumers' preferences and the recommendations by KEBS (2001)/**Appendix 4B**, and Faust *et al.* (2006). Since retailers and manufacturers use size labels for product differentiation, consumers should therefore be educated on what size labels presented on their apparel mean and how the size labels relate to their body dimensions and shapes.

Communication to the consumer through labelling should contain sizing and fit information that is clear, informative and understandable – information that is currently not given through the non-informative, lettered and numbered size codes in use. This means that the consumer should be able to easily identify the size of the garment. It could include size symbols, such as the pictogram, that would quickly communicate to the consumer the key body dimensions that the garment was designed to fit. Secondly, keeping women consumers' lack of knowledge regarding their own key body dimensions in mind, retailers and companies would benefit by also providing their customers with the skills to utilise the information. In addition to understanding the sizing code on the label, apparel consumers should know which body dimensions are used to size a garment, and also how to determine their own body dimensions, in order to make an appropriate size choice. This would call for a creative, but not impossible, joint attempt by retailers and their consumer advisors – an initiative that could not only benefit the apparel consumer, but also the specific company and/or retailer, and ultimately the industry as a whole.

Although this was a case of the Kenyan female apparel consumer's lack of knowledge regarding important sizing and fit issues, concern about female consumers' many problems regarding the fit of their clothes is not restricted to Kenya, while the plea that the apparel industry should at least try to address some of these problems (amongst which, the communication of sizing through informative size labels), is a worldwide phenomenon.

Confusion can affect both consumers' rights and the quality of consumers' decisions. Confused consumers are less able to process information and hence more vulnerable to making less than optimum choices. Therefore, marketers within the apparel sector need to identify the effects associated with confusion, consumer reaction to confusion and how marketing issues could be used to counteract this. Consumers who are knowledgeable about size and fit would therefore be able to select well-fitting apparel and would be able to identify the sources of fit problems, and act accordingly. Therefore, it is recommended that consumer education on size and fit be used as part of apparel industries' promotional strategies to win and retain consumers, while the consumers become equipped with knowledge.

While the apparel industry is expected to produce apparel within the consumers' fit preferences, the consumers on the other hand should be equipped with skills essential for dressing appropriately. It is acknowledged that fit preference is subjective and varies from one person to another. It is also sometimes influenced by internal factors such as personal preferences, expectations and the fashion trend (Alexander *et al.,* 2005). However, the comfort or ease that a person requires in an apparel item depends mainly on that individual's body's physical characteristics (critical fit points). Apparel designers must therefore incorporate consumers' fit preferences within their designs, and that could result in appropriate fashionable styles for the curvy rectangular Kenyan body shape that was identified, or any other prevalent shape identified in any market environment. Since comfort is one of the attributes of fit, fabric stretch characteristics could be incorporated into the consumers' preferred fitted skirts and jackets to provide comfort, while the closer fit required by the consumers could still be maintained.

Since the majority of apparel industries use the hourglass shape for marketing purposes (LaBat & DeLong, 1990; Fiore & Kimle, 1997:30; Alexander & Connell, 2005), it could be recommended that more realistic expectations of the consumers in any market be taken into consideration, by presenting models with the predominant body shape in a full range of the sizes available within the target market.

7.7.2   Government agencies and consumer-oriented organisations

To serve effectively the needs of the career women segment, governmental agencies and private consumer-oriented organisations such as service providers must understand the barriers that prevent the consumers from exercising their rights**.** Being a pilot study in Kenya, this research project highlights many other areas of potential study. It would be recommended to the Kenyan government (Kenya Bureau of Standards) that a national anthropometric survey be carried out. Alternatively, anthropometric surveys could be carried

out on a small-scale basis, covering specific market regions for the purposes of establishing representative sizing systems (size tables as well as body shape categories) applicable to those regions. Kenya's Bureau of Standards needs to adjust their current sizing systems to cater for the curvy rectangular body shape.

The advantages of consumer education as part of a competitive strategy are perceived to help obtain and keep satisfied customers, to contribute to the favourable attitude formed among consumers toward a product or company, and to help reduce confrontations with consumer advocates. Consumer education and counselling programmes that should also include information and referral services need to be developed to equip the consumers with the appropriate knowledge that could help them make informed purchasing decisions.

It has been observed that knowledgeable consumers are adept at forming choice-sets (De Klerk & Tselepis, 2007). Skills in decoding size labels and the key dimensions in order to identify a size would help consumers in selecting apparel with the correct size and fit. Loker *et al.* (2005) observed that participants were able to give accurate dimensions when instructions were given on how to take measurements, as opposed to when instructions were not provided. Through counselling and educating consumers on the meaning of the different size codes, and identifying their key dimensions and own body shapes, consumers would be able to link different size codes to their measurements and shapes, and finally select appropriate apparel styles and sizes.

Consumer education and counselling programmes may also include information and referral services such as wardrobe planning and management strategies that give instructions on appropriate dressing for different body shapes. Issues such as body cathexis/self-esteem could also be incorporated into the education programmes to help the consumers appreciate their shapes/images, and to dress accordingly.

7.8   LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FUTURE STUDIES

It should be noted that there are certain limitations to this research that also provide a basis for further research. Studying apparel's size and fit problems as regards the female body shape is a new phenomenon in Kenya. The most striking limitation of this study was access to the participants. The sensitive nature of measuring and photographing women in minimal clothing demands understanding their culture and beliefs. It also requires sufficient financial means to give the participants incentives, a longer time for negotiations (persuasion) and a more versatile studio setting. However, if sensitising programmes were administered ahead

of time and alongside with the use of modern and efficient technology, more participants would likely participate.

The results on the distinctive body shape (phase one) were based on only 123 measured and 89 photographed career women of only two regions of Kenya. It is suggested that similar research be conducted on a larger sample, and perhaps using modern technology such as body scanners. The results on the questionnaire (phase two) were only based on the opinions of the high school female teachers within two regions of Kenya, assumed to represent career women in Kenya. Again, it is suggested that similar research be conducted in all the regions and with a more representative sample.

Finally, the aim of this study was to identify the distinctive female body shape of Kenyan career women and to analyse apparel's fit problems associated with it. It was also to assess career women's perceptions regarding general fit problems with the ready-made apparel, explore their knowledge about the communication of size and fit and to determine their fit preferences for differently fitted apparel. These factors were used to establish how they could contribute to fit problems of the ready-made apparel in Kenya. In spite of the limitations mentioned, and possibilities for improvement of the methodology, the results of this study should be used as a pilot study to improve the size and fit of apparel in Kenya as well as other developing African countries.