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# A Comparison Study of Brassiere Preferences and Breast Perceptions among the Middle-aged and Older US Women

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#### **Abstract**

The bra is one of the most essential pieces of women's underwear which gives support for the breasts and holds them in position to make better outer appearance of upper body. Despite being worn by most women of all ages, brassiere manufacturers often use brassiere sizes and shapes that are close to the body measurements of women in their 20s, which raises questions whether the bras are suitable for older women's physique. Also, many lingerie markets tend to center on designs and tastes of younger women, leaving those of older women are largely ignored in the manufacturing process despite the fact that their purchasing power and market shares are expected to grow in conjunction with the aging of the global population. Against this backdrop, this study attempts to provide information about bra preferences and breast perceptions of the middle-aged and older US women over the age of 40 years to help manufacturers better understand the bra purchasing priorities and bra elements of older women and prompt them to design bras with a high level of fit and comfort that are appreciated by the population groups as a means to ultimately acquire competitive edge in the fast growing aging market. An email survey and interviews were conducted with 301 US women who live in New York City. The findings of this study suggest that there are internal and external factors such as changes in body and breast shapes with age influence the level of fitness and effectiveness of bra components, and thus the responses to the questions on bra preferences and breast perceptions varied between the researched age groups.

#### **Keywords**

US women, Brassiere, Preferences, Breast perceptions

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# **INTRODUCTION**

The widespread of the Internet, broadband access networks, and information and communication technologies have contributed to lowering market barriers between countries, making it easier for businesses to make inroads into foreign markets. This is also true for the fashion industry, where trends and tastes keep on changing, and even though still a disadvantage, there is a growing number of consumers who are willing to purchase their clothes online from overseas without actually trying them on (Kim, 2009). In addition, popular and well-known global apparel and SPA brands expand their existing clothing lines into underwear by featuring more diverse styles, colors, and even functional products with a high level of fit and comfort to increase their market shares and brand power in the



local apparel industry. Against this backdrop, it is important for underwear businesses and manufacturers to have a competitive edge in the globalizing market through the evaluation of their potential overseas consumers with respect to the factors influencing purchase such as wearing behaviors, preferences, dissatisfaction factors, etc.

The bra is one of the most essential pieces of women's underwear which primarily aims to provide support for the breasts, prevent them from swaying and improve the silhouette of upper torso. Although it is worn by most women of all ages beyond puberty, lingerie markets in many countries tend to center on designs and sizes of younger women, bringing up questions about whether these bras are suitable for older women, or whether older women may feel these designs and sizes are inappropriate for their current physique and personality (Birtwistle & Tsim, 2005). For example, the Korean brassiere manufacturers in general use a set of standardized brassiere sizes determined by the Korean Standards Association (Lim, 2004), which neglects to include breasts and bra sizes for all ages, but that of women in their 20s whose bodies do not show biological aging and stays in a near perfect shape, especially in their bust area (Park, 2000; Kim, 2013). This practice has reportedly caused widespread discontent of wearing a bra and raised health concerns among the older consumer groups (Kim, 2013).

It has been suggested that the majority of mature consumers hold different priorities for selecting clothes than younger consumers (Birtwistle & Tsim, 2005) as they often feel pressured to continue their effort to reverse the signs of increasing age amidst the society's obsession with youthfulness and fear of aging (Clarke & Griffin, 2008). Although it is not known that women's psychological influence of aging affects their clothing preferences or requirements (Risius, 2013), their physical changes with age, including increased body weight, and waist and hip circumferences, decreased height and upper torso length, sagging breasts, and rounded shoulders can have significant influence on their evolving perspective in selecting clothes.

However, the preferences of older women for clothing, especially their bra preferences, have been largely ignored in the literature (Twigg, 2007). There are number of comparison studies conducted on clothing preferences of women according to age, but

most of them merely covers subjects related to formal and casual outer garments, and younger consumers (e.g. Ahn *et al.*, 2001; Park, 1999; Im & Han, 2008). Thus, the influence of aging on a mature woman's perception of her breasts and bra preferences remains poorly understood (Risius, 2014).

Needless to say, better understanding of bra requirements and preferences of mature consumers is essential for the concerned businesses to take advantage of the high market growth potential in the face of the rapidly growing aging population and their market expansion (Seo, 2009; Kim & Lee, 2010). Therefore, this study aims to enhance the understanding of the bra elements required to satisfy mature consumer groups by identifying their bra wearing behaviors, general awareness of wearing a bra, and perception of their breasts, and comparing them within the age groups.

# **Study Methods**

#### Study samples and duration

The participants of the survey included women over 40 residing in New York City. Of all the survey responses, incomplete or unreliable responses were excluded and a total of 301 responses, consisting of 132 women in their 40s, 101 in their 50s and 68 in their 60s, were used for data analysis. After an in-depth review and revise of the survey questions through a preliminary test, the actual survey took place in early December through March 2014.

### Survey tools and data collection

The women in their 40s and 50s submitted their survey via emails, while the women in their 60s gave their answered through individual interviews. The survey is referred to a previous study carried out by Kim (2013), and divided into sections which consist of a number of questions in relation to brassiere preferences, breast shapes, sizes and perceptions, and general characteristics of the respondents.

### **Data Analysis**

The survey data was processed through a statistics program, SPSS ver. 17.0 (SPSS Inc., Chicago, IL, USA), and then each section was cross-examined between the age groups using cross-analysis and technical statistics analysis.



Table 1. General characteristics of respondents

N (%)

Cotogowy			Age			
	Category	40-49	50-59	60-69	- Total	
Age		132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	
Number of children	None	37 (12.29)	14 ( 4.65)	13 ( 4.32)	64 ( 21.26)	
	1 or 2	70 (23.26)	59 (19.60)	44 (14.62)	173 ( 57.48)	
	3 or more	25 ( 8.31)	28 ( 9.30)	11 ( 3.65)	64 ( 21.26)	
Breast feeding experience	Yes	66 (21.93)	67 (22.26)	42 (13.95)	175 ( 58.14)	
	No	66 (21.93)	34 (11.30)	26 ( 8.64)	126 ( 41.86)	
Annual income	Less than \$19,999	21 ( 6.98)	26 ( 8.64)	17 ( 5.65)	64 ( 21.26)	
	\$20,000 - \$49,999	63 (20.93)	35 (11.63)	34 (11.30)	132 ( 43.85)	
	More than \$50,000	48 (15.95)	40 (13.29)	17 ( 5.65)	105 ( 34.88)	
Academic background	High school diploma	32 (10.63)	30 ( 9.97)	32 (10.63)	94 ( 31.23)	
	Associate diploma or Bachelor's degree	77 (25.58)	57 (18.94)	29 ( 9.63)	163 ( 54.15)	
	Master's course or higher	23 ( 7.64)	14 ( 4.65)	7 ( 2.33)	44 ( 14.62)	
Total		132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	

Table 2. Bra fit preference

N (%)

Category ——		Age		- Total	. 2
	40-49	50-59	60-69	Total	χ²
Slightly loose	7 ( 2.33)	13 ( 4.32)	32 (10.63)	52 ( 17.28)	
Just fitting	65 (21.59)	47 (15.61)	26 ( 8.64)	138 ( 45.85)	60.91***
Slightly snug	53 (17.61)	36 (11.96)	10 ( 3.32)	99 ( 32.89)	df=6
Very snug	7 ( 2.33)	5 ( 1.66)	0 ( 0.00)	12 ( 3.99)	
Total	132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	_

<sup>\*\*\*</sup>p<0.001

# **Results and Analysis**

### General characteristics of respondents

The general characteristics of the respondents were shown on Table 1. More than a half of respondents (57.48%) said that they have one or two children. The percentage of having no children was highest among the women in their 40s (12.29%), which was about 2.5 times higher than other age groups, while having more than 3 children was highest among the women in their 50s. For the question on the breast feeding experience, 58.14% of all the respondents answered 'yes', while the highest percentage of women in their 40s answered 'no' to having breast feeding experience, which corresponds with the result that a high percentage of women in the same age group had no child.

Most women in their 40s and 60s said their annual income is in the range of \$20,000-\$49,000, and the women in their 50s

estimated that their household income is over \$50,000 per year. An associate diploma or a Bachelor's degree was the most commonly achieved education level by the women in their 40s and 50s, while the largest number of women in their 60s said they have a high school diploma.

### Preference for bra fitting and bra components

The results of bra fit preferences and preferred bra components are shown on Table 2 and 3, respectively. Women in their 40s (21.59%) and 50s (15.61%) wanted their bras to fit just right, while 10.63% of women in their 60s preferred a little loose fit. This result shows that in general, as women grow older, they want more room and comfort but less tightness in their clothes. A previous comparison study on preferred bra fit for Korean and US women in their 30s by Kim & Kim (2014) revealed that about 56.01% of Korean women who took part in the study said that they wanted



Table 3. Preferred types of bras

N (%)

Table 3. I referred types			Age			2	
	Category	40-49	50-59	60-69	– Total	$\chi^2$	
Type of bra cups	Molded	78 (25.91)	56 (18.60)	26 ( 8.64)	160 ( 53.16)		
	Woven (with sewn lines inside the cups)	32 (10.63)	33 (10.96)	30 ( 9.97)	95 ( 31.56)	12.69*	
	Sports bra	15 ( 4.98)	5 ( 1.66)	7 ( 2.33)	27 ( 8.97)	df=6	
	Tank-top	7 ( 2.33)	7 ( 2.33)	5 ( 1.66)	19 ( 6.31)		
With wire or wireless	With wire	70 (23.26)	42 (13.95)	21 ( 6.98)	133 ( 44.19)	9.34**	
	Wireless	62 (20.60)	59 (19.60)	47 (15.61)	168 ( 55.81)	df=2	
Shape of support band	Wide supported-type	60 (19.93)	56 (18.60)	25 ( 8.31)	141 ( 46.84)	<b>5.00</b>	
	Normal supported-type	66 (21.93)	38 (12.62)	38 (12.62)	142 ( 47.18)	7.22 df=4	
	No support band	6 ( 1.99)	7 ( 2.33)	5 ( 1.66)	18 ( 5.98)	u1–4	
Width of side bands	Normal	52 (17.28)	33 (10.96)	37 (12.29)	122 ( 40.53)	1 < 0.4*	
	Wide	52 (17.28)	58 (19.27)	24 ( 7.97)	134 ( 44.52)	16.84* df=4	
	Very wide	28 ( 9.30)	10 ( 3.32)	7 ( 2.33)	45 ( 14.95)	u1-4	
Width of strap	Normal (about 1.5 cm)	56 (18.60)	38 (12.62)	36 (11.96)	130 ( 43.19)	4.21	
	Slightly wide (1.6-2.5 cm)	52 (17.28)	41 (13.62)	20 ( 6.64)	113 ( 37.54)	4.31 df=4	
	Very wide (wider than 2.5 cm)	24 ( 7.97)	22 ( 7.31)	12 ( 3.99)	58 ( 19.27)	u1—4	
Type of closure	Back hook	101 (33.55)	71 (23.59)	43 (14.29)	215 ( 71.43)	5.00	
	Front hook	19 ( 6.31)	23 ( 7.64)	16 ( 5.32)	58 ( 19.27)	5.80 df=4	
	Over the head	12 ( 3.99)	7 ( 2.33)	9 ( 2.99)	28 ( 9.30)	u1-4	
Back shapes	U-shape	65 (21.59)	51 (16.94)	31 (10.30)	147 ( 48.84)	0.40	
	Straight-line	52 (17.28)	39 (12.96)	28 ( 9.30)	119 ( 39.53)	0.48 df=4	
	Tank-top	15 ( 4.98)	11 ( 3.65)	9 ( 2.99)	35 ( 11.63)	u1-4	
Color preference	White	33 (10.96)	38 (12.62)	34 (11.30)	105 ( 34.88)		
	Nude	57 (18.94)	44 (14.62)	27 ( 8.97)	128 ( 42.52)		
	Pink	8 ( 2.66)	5 ( 1.66)	2 ( 0.66)	15 ( 4.98)	20.72*	
	Red	2 ( 0.66)	0 ( 0.00)	0 ( 0.00)	2 ( 0.66)	df=10	
	Shades of blue	3 ( 1.00)	1 ( 0.33)	0 ( 0.00)	4 ( 1.33)		
	Black	29 ( 9.63)	13 ( 4.32)	5 ( 1.66)	47 ( 15.61)		
Favorite fabrics	Cotton	89 (45.88)	57 (29.38)	48 (24.74)	194 (100.00)		
(2 responses are required)	Organic cotton	19 (25.68)	26 (35.14)	29 (39.19)	74 (100.00)		
	Cotton and spandex	98 (47.34)	73 (35.27)	36 (17.39)	207 (100.00)	-	
	Polyester/nylon	26 (37.68)	29 (42.03)	14 (20.29)	69 (100.00)		
	Lace	21 (58.33)	10 (27.78)	5 (13.89)	36 (100.00)		
	Tencel	11 (50.00)	7 (31.82)	4 (18.18)	22 (100.00)		
Total		132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	-	

\*p<0.05, \*\*p<0.01

their bras to fit slightly loose, while 53.77% of their American counterpart wanted the fit to be just right. The result revealed that American women wanted a little tighter fitting so that the bra can firmly hold their breasts in position.

For questions on preferred bra types, 'molded' bra cup was most favored by women in their 40s (25.91%) and 50s (18.60%), followed by 'woven' cup, 'sports' and 'tank-tops'. Among women in their 60s, the largest number of the respondents (9.97%) chose

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'woven' cup as their favorite, followed by 'molded' cup, 'sports' and 'tank-tops'. While 23.26% of women in their 40s preferred bras 'with wire', the highest percentage of women in their 50s (19.60%) and 60s (15.61%) preferred bras 'without wire'. For the question on the shape of support band, most women in their 40s and 60s liked 'normal supported-type', while women in their 50s preferred 'wide supported-type'. In relation to width of side bands, 'normal' and 'wide' were most preferred by women in their 40s, while 19.27% of women in their 50s and 12.29% of women in their 60s chose 'wide' as their favorite width of side bands. As for width of strap, women in their 40s and 60s preferred normal width (about 1.5cm), while slightly wide width (1.6-2.5cm) was most preferred by women in their 50s (13.62%). For type of closure, 71.43% of all respondents preferred the hook & eye fastener to be on the back of bras, while 'over the head' was least preferred due to its inconvenience of taking off, that only 9.3% chose the type. As for back shapes, 'U-shape' (48.84%) was the most popular bra back shape among all the age groups. For bra colors, women in their 40s

(18.94%) and 50s (14.62%) most preferred 'nude' color for their bras, while 'white' was the choice of women in their 60s (11.30%). Women in their 40s and 50s selected 'cotton and spandex' as their favorite fabric for bras, while women in their 60s most preferred 'cotton', which is known to be more appreciated with age (Seo & Chung, 2008). 'Lace' was the least favored fabric regardless of age.

### Breast shapes and bra size

For the question on perception of breast shapes, 'Sagging I' was the most common response from all the age groups as shown on Table 4, followed by 'Conical shape' (7.64%) and 'Dome shape' (6.64%) for women in their 40s; 'Conical shape' (5.65%) and 'Sagging II' (5.32%) for women in their 50s; and 'Sagging I' (9.97%), 'Sagging II (8.64%) for women in their 60s. No woman in her 60s perceived her breasts to be 'Dome shape'. There is a gradual increase in the number of respondents perceiving their breasts to be in the Sagging shapes as they grow older. This is

Table 4. Breast shapes N (%)

Age	Flat shape	Conical shape	Dome shape	Protruding	Sagging I	Sagging II	Total	$\chi^2$
40-49	5 (1.66)	23 ( 7.64)	20 (6.64)	7 (2.33)	64 (21.26)	13 ( 4.32)	132 ( 43.85)	40.04***
50-59	2 (0.66)	17 ( 5.65)	7 (2.33)	9 (2.99)	50 (16.61)	16 ( 5.32)	101 ( 33.55)	40.24*** df=10
60-69	4 (1.33)	4 ( 1.33)	0 (0.00)	4 (1.33)	30 ( 9.97)	26 ( 8.64)	68 ( 22.59)	u1–10
Total	11 (3.65)	44 (14.62)	27 (8.97)	20 (6.64)	144 (47.84)	55 (18.27)	301 (100.00)	-

<sup>\*\*\*</sup>p<0.001

Table 5. Band size N (%)

Band size		Age		Total $\chi^2$		
(inch)	40-49	50-59	60-69	- Iotai	χ	
30	1 ( 0.33)	0 ( 0.00)	0 ( 0.00)	1 ( 0.33)		
32	12 ( 3.99)	2 ( 0.66)	2 ( 0.66)	16 ( 5.32)		
34	22 ( 7.31)	6 ( 1.99)	11 ( 3.65)	39 ( 12.96)		
36	46 (15.28)	41 (13.62)	16 ( 5.32)	103 ( 34.22)		
38	20 ( 6.64)	23 ( 7.64)	24 ( 7.97)	67 ( 22.26)	22.40*	
40	14 ( 4.65)	18 ( 5.98)	9 ( 2.99)	41 ( 13.62)	33.40* df=20	
42	8 ( 2.66)	7 ( 2.33)	3 ( 1.00)	18 ( 5.98)	ui=20	
44	5 ( 1.66)	3 ( 1.00)	2 ( 0.66)	10 ( 3.32)		
46	3 ( 1.00)	0 ( 0.00)	1 ( 0.33)	4 ( 1.33)		
48	0 ( 0.00)	1 ( 0.33)	0 ( 0.00)	1 ( 0.33)		
50	1 ( 0.33)	0 ( 0.00)	0 ( 0.00)	1 ( 0.33)		
Total	132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	-	

\*p<0.05



Table 6. Cup size N (%)

Cun siza		Age		– Total	$\chi^2$	
Cup size	40-49	50-59	60-69	- 10tai	χ	
A	11 ( 3.65)	3 ( 1.00)	7 ( 2.33)	21 ( 6.98)		
В	33 (10.96)	23 ( 7.64)	14 ( 4.65)	70 ( 23.26)		
С	45 (14.95)	51 (16.94)	26 ( 8.64)	122 ( 40.53)	22.04*	
D	23 ( 7.64)	15 ( 4.98)	18 ( 5.98)	56 ( 18.60)	22.04* df=12	
DD	17 ( 5.65)	8 ( 2.66)	1 ( 0.33)	26 ( 8.64)	u1–12	
DDD	3 ( 1.00)	1 ( 0.33)	1 ( 0.33)	5 ( 1.66)		
Е	0 ( 0.00)	0 ( 0.00)	1 ( 0.33)	1 ( 0.33)		
Total	132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	-	

\*p<0.05

Table 7. Bra size N (%)

band	cup	A	В	С	D	DD	DDD	Е	Total
30		1 (0.33)	0 ( 0.00)	0 ( 0.00)	0 ( 0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 ( 0.33)
32		7 (2.33)	3 ( 1.00)	1 ( 0.33)	2 ( 0.66)	2 (0.66)	1 (0.33)	0 (0.00)	16 ( 5.32)
34		6 (1.99)	24 ( 7.97)	8 ( 2.66)	0 ( 0.00)	1 (0.33)	0 (0.00)	0 (0.00)	39 ( 12.96)
36		5 (1.66)	36 (11.96)	50 (16.61)	6 ( 1.99)	5 (1.66)	1 (0.33)	0 (0.00)	103 ( 34.22)
38		2 (0.66)	1 ( 0.33)	39 (12.96)	15 ( 4.98)	9 (2.99)	1 (0.33)	0 (0.00)	67 ( 22.26)
40		0 (0.00)	4 ( 1.33)	17 ( 5.65)	17 ( 5.65)	1 (0.33)	2 (0.66)	0 (0.00)	41 ( 13.62)
42		0 (0.00)	2 ( 0.66)	5 ( 1.66)	5 ( 1.66)	5 (1.66)	0 (0.00)	1 (0.33)	18 ( 5.98)
44		0 (0.00)	0 ( 0.00)	0 ( 0.00)	8 ( 2.66)	2 (0.66)	0 (0.00)	0 (0.00)	10 ( 3.32)
46		0 (0.00)	0 ( 0.00)	1 ( 0.33)	3 ( 1.00)	0 (0.00)	0 (0.00)	0 (0.00)	4 ( 1.33)
48		0 (0.00)	0 ( 0.00)	0 ( 0.00)	0 ( 0.00)	1 (0.33)	0 (0.00)	0 (0.00)	1 ( 0.33)
50		0 (0.00)	0 ( 0.00)	1 ( 0.33)	0 ( 0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 ( 0.33)
Tota	l	21 (6.98)	70 (23.26)	122 (40.53)	56 (18.60)	26 (8.64)	5 (1.66)	1 (0.33)	301 (100.00)

because the female breasts tend to slope downwards with age as a result of natural and progressive biological change in the muscle, fat and skin of the breasts (Kim *et al.*, 2012).

The results of the questions on band size and cup size are as shown on Table 5 and 6. It was revealed that most common band size for women in their 40s and 50s was '36 inch', while '38 inch' was chosen by women in their 60s. This supports the results from the question on bra fit preference as shown on Table 2, where the respondents from the age groups of 40s and 50s indicated their preference of wearing a bra as 'just fitting', while most respondents from the age group of 60s said that they prefer 'slightly loose' fitting. 'C' cup bra was most common among all the age groups, followed by B cup and D cup for women in their 40s and 50s; and D cup and B cup for women in their 60s.

The responses for bra sizes were 36 inch (34.22%), 38 inch (22.26%), 40 inch (13.62%), and 34 inch (12.96%) for band size; C cup (40.53%), B cup (23.26%), and D cup (18.60%) for cup size; and 36C (16.61%), 38C (12.96%), 36B (11.96%), and 34B (7.97%) for bra size in the order of most to least frequency as stated by all the age groups on Table 7. As compared with the results from a previous study on brassiere sizes of US women in their 30s by Kim & Kim (2014), 36C (11.32%), 36D (10.37%), 38C (9.43%), and 38D (8.49%) in the order of most to least frequently appeared sizes among the respondents, the results suggest that the volume of the breast increases proportionally with age, while the bra cup size decreases because the breasts lose their firmness and start to sag downwards with age (Yi & Choi, 1995; Park & Sohn, 2001; Na, 2009).



Table 8. Difficulty in finding a well-fitting bra

N (%)

Catagory		Age	– Total	$\chi^2$		
Category	40-49	50-59	60-69	- Iotai	χ	
It is easy	26 ( 8.64)	15 ( 4.98)	12 ( 3.99)	53 ( 17.61)		
It is somewhat difficult	64 (21.26)	49 (16.28)	37 (12.29)	150 ( 49.83)	3.58	
It is very difficult	32 (10.63)	32 (10.63)	15 ( 4.98)	79 ( 26.25)	df=6	
Can never find a well-fitting bra	10 ( 3.32)	5 ( 1.66)	4 ( 1.33)	19 ( 6.31)		
Total	132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	-	

Table 9. Reasons for having trouble finding a well-fitting bra

N (%)

Catagory		Age	- Total	$\mathbf{v}^2$	
Category	40-49	50-59	60-69	Total	χ
I'm not sure of my size	32 (10.63)	32 (10.63)	16 ( 5.32)	80 ( 26.58)	0.54
Stores don't carry my size	23 ( 7.64)	17 ( 5.65)	10 ( 3.32)	50 ( 16.61)	2.56 df=4
I don't like the styles available	77 (25.58)	52 (17.28)	42 (13.95)	171 ( 56.81)	u1— <del>4</del>
Total	132 (43.85)	101 (33.55)	68 (22.59)	301 (100.00)	-

For the question on the level of difficulty purchasing a wellfitting bra, most women have trouble finding a well-fitting bra as the largest number of women responded that it is 'somewhat difficult' (49.83%) and 'very difficult' (26.25%), while 6.31% even said that they cannot find a bra that fits them well as shown on Table 8. When asked about the reasons for having trouble finding a well-fitting bra, more than a half of all respondents (56.81%) chose 'I don't like the styles available', followed by 'I'm not sure of my size'(26.58%), and 'Stores don't carry my size'(16.61%) as shown on Table 9. The results support the general trend of apparel industry that manufacturers tend to focus on the tastes, styles and body sizes of younger generation, but often neglect the need and demands of the older generation. This suggests the importance of improving manufacturers understanding of breast sizes and shapes of older women as well as their tastes and styles in general in order to produce more functional and comfortable bras that can be appreciated by mature consumer groups. Also in the same vein, the consumers should be more knowledgeable of their breasts so as to find a bra that can satisfy their needs (Choi et al., 2013).

# Conclusion

This study was conducted to examine bra preferences and breast perceptions of US women over the age of 40 years. It was revealed that women tend to favor more comfortable and a little loose fitting, and prefer bras without wire as they grow older because holding breasts in position with underwire can be burdensome to many elderly women. As shown in the results, women in their 40s preferred molded cup bras with wire, while molded cup bras without wire and woven cup bras without wire were the most preferred bra types of women in their 50s and 60s, respectively. Most women of all the age groups preferred 'back hook' closure, and 'U-shape' bra back as it supports breasts well in shape and helps reduce excess fat on the back and around bra line (Shin, 2010). In relation to responses to the questions for preferred bra colors and fabrics, 'nude', 'white' and 'black', and 'cotton and spandex', 'cotton' and 'organic cotton' were chosen by all the age groups in the order of most to least preferences. The results may suggest the women's simple and healthy tastes in bras. For breast shapes, 'Sagging I' (47.84%) appeared most frequently among the women of all the age groups, followed by 'Sagging II' (18.27%), 'Conical shape' (14.62%), 'Dome shape' (8.97%), 'Protruding' (6.64%) and 'Flat shape' (3.65%). However, as the results did not consider possible volume and shape inconsistencies that may exist within the same categories of breast shape for different age groups, it is necessary to utilize 3D or direct body measurements to identify more precise breast shapes for each age group.

The findings of this study have proven internal and external factors such as changes in body and breast shapes influence the level of fitness and effectiveness of bra components for women



aged between their 40s and 60s. In other words, as female breasts gradually lose their firmness and slope downward with age in general and different age groups go through different stages of biological change, many responses to questions on bra preferences and breast perceptions varied between the researched age groups. Although randomly selected study samples in the applicable region may prevent the study results from broadly applied or interpreted, and thus separate studies should follow in order to gather more accurate information and data even within the same age groups, it is acknowledged by many that the current process and practice of manufacturing fashion garments, especially bras which are worn next to the most biologically sensitive skin of women, may not stand well without considering the influential factors to determine the appropriateness of bras for older generation in the fast growing aging market.

Therefore, as implied in this study, a careful study of bra purchasing priorities and the application of suitable designs and patterns for a specific age group should help increase the targeted consumers' level of satisfaction of wearing a bra and also place many businesses and manufacturers in a better position in the existing and future aging markets.

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# References

Ahn, C., Lee, S., Yang, Y., Lim, S., Lennon, S. J., & Parker, S. M. (2001). A comparative research on Korean and American consumer's preference on selected Korean and American textiles for women's formal wear. *Journal of the Korean Society of Clothing and Textiles*, 25(2), 217-227.

Birtwistle, G., & Tsim, C. (2005). Consumer purchasing behavior: an investigation of the UK mature women's clothing market. *Journal of Consumer Behaviour*, 4(6), 453-464.

Choi, K., Ryu, Y., Kim, I., & Jun, J. (2013). Development of the size specifications of bra tops for senior women. *Journal of the Korean Society of Design Trend*, *39*, 271-280.

Clarke, L., & Griffin, M. (2008). Visible and invisible ageing: beauty work as a response to ageism. *Ageing and Society*, 28(5), 653-674.

Im, S., & Han, M. (2008). A cross-cultural study on the clothing value: focusing on Korea and the United States. *The Research Journal of the Costume Culture*, 16(4), 619-633.

Kim, E. Y. (2009). A comparison of the benefits for online clothing purchases between Korean and U.S. consumers. *Journal of the Korean Society of Clothing and Textiles*, *33*(7), 1074-1085.

Kim, H. S., & Kim, J. M. (2014). A comparative study on the bra wearing awareness and preferences between Korean and American women in their 30s. *Journal of the Korean Society of Design Trend*, 44, 407-416.

Kim, H. S., Lee, S. Y., Kim, J. M., & Lee, J. H. (2012). Analysis on torso shapes of women in 50s and 60s. *Journal of the Korean Society of Clothing Industry*, 36(3), 311-323.

Kim, J. H., & Lee, Y. J. (2010). A study on clothing purchasing behavior and preference images of the fashion items according to the age groups of the elderly woman. *Journal of the Korean Society of Clothing Industry*, 12(3), 279-290.

Kim, J. M. (2013). Classification of breast types through 3D human body scan data and brassiere construction by utilizing functional components: a focus on women in their 30s. Unpublished doctoral dissertation, Konkuk University, Seoul, Korea.

Lim, J. (2004). A survey on the wearing conditions for the improvement of wearing comfort of brassiere. *Journal of the Korean Society of Clothing Industry*, 6(4), 455-460.

Na, M. (2009). A study on the development of brassiere pattern for elderly women. *Journal of Korean Association of Human Ecology*, 18(2), 397-406.

Park, E. M. (2000). A study on the brassiere sizing system and the basic pattern development for adult women. Unpublished doctoral dissertation, Sookmyung Women's University, Seoul, Korea.

Park, E. M., Kim, Y. S., & Sohn, H. S. (1997). A study on the sale conditions of the current brassiere products: focusing on the sale of brassiere for the elderly women. *Journal of Fashion Business*, *1*(3), 60-70.

Park, S. Y., & Sohn, H. S. (2001). A study on elderly women's breast types and their brassiere sizes. *Journal of Fashion Business*, *5*(4), 144-157.

Park, W. (1999). Preferred style of clothing with Body cathexis by Korean and American female students. *Journal of Korean Society of Costume*, 48, 25-36.

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# International Journal of Human Ecology

Risius, D. J. (2012). *An investigation of breast support for older women.* Unpublished doctoral dissertation. University of Portsmouth, Portsmouth, UK.

Risius, D., Thelwell, R., Wagstaff, C. R. D., and Scurr, J. (2014). The influence of ageing on bra preferences and self-perception of breasts among mature women. *European Journal of Ageing*, *11*, 233-240.

Seo, Y. H. (2009). Study of brassier design for elderly women based upon analysis current sales of brassier. Unpublished doctoral dissertation, Chung-Ang University, Seoul, Korea.

Seo, Y. H., & Chung, S. H. (2008). Study of elderly women's buying

behavior of panty and brassier and wearing test of brassier. *Journal of the Korean Society of Clothing and Textiles*, 32(7), 1013-1022.

Shin, K. (2010). *Patternmaking for underwear design*. USA: Kristina Shin.

Twigg, J. (2007). Clothing, age and the body: a critical review. *Ageing and Society*, 27(2), 285-305.

Yi, K., & Choi, H. (1995). A study on breast shapes for developing elderly women's brassiere. *Journal of the Korean Society of Clothing and Textiles*, 19(6), 995-1007.