



Investigating The Impact of Body Shape on Garment Fit

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1. Introduction

Clothing fit is the most salient factor consumers consider before purchasing a garment (Makhanya and Mabuza, 2020). Studies indicate that when garments do not fit correctly, the wearer blames their body, resulting in a manifestation of high body image dissatisfaction (Rieke, Fowler, Chang and Velikova, 2016). Hence, it is paramount that clothing retailers offer clothes that fit adequately and contribute to wearers' confidence. Currently, the fashion industry is plagued with clothing fit issues, including non-standardised sizing, vanity sizing, and the negligence of different body shapes (Reid, Vignali, Baker, Chrimes and Vieira, 2020). Unsurprisingly, poorly fitted garments are among the most-cited problems with purchasing clothing.

Individual body variations add to the complexity of achieving satisfactory clothing fit (Shin and Damhorst, 2018). Specifically, Pisut and Connell (2007) claim that body shape variation determines how a garment hangs on a person. Nonetheless, few fashion retailers offer body shape provision (Gill, 2015) or even feature models with varying body shapes on their ecommerce website product pages, resulting in calls for research to provide a greater understanding of different body shapes in the fashion industry (Mulgrew, Schulz, Norton and Tiggeman, 2020). From an industry perspective, 70% of UK females acknowledge that they would find it easier to shop at a retailer that offers clothing for various body shapes (Intel, 2019). Therefore, further research into how females who share the same body shape classification experience dress fit is required.

Academics are recognising the importance of understanding different body shapes in enhancing satisfaction with clothing fit (Lee, Istook, Nam and Park, 2007), with some asserting that adequate clothing fit is about body shape, not about clothing size (Alexander, Connell and Presley, 2005). Gupta (2020) claimed that the lack of body shape understanding and the

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3 overrepresentation of ideal body shapes are pertinent factors galvanising poor fit. Research
4 shows that identically sized garments can look exceedingly different on different body shapes
5 (Pisut and Connell, 2007), supporting the notion that body shape variation determines how well
6 a garment will fit (Sattar, Pons-Moll and Fritz, 2019). Yet, existing research predominately
7 focuses on sizing issues such as non-standardised sizing, as opposed to body shape.
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15 Body shape is a critical variable influencing consumers' garment choices (Zakaria,
16 2017) yet, research investigating how UK females with varying body shapes evaluate and
17 experience fit is limited. Moreover, while digital methods exist to classify female body shapes,
18 application in a commercial setting is limited. To fill this gap within the literature, this study
19 aims to understand the influence of body shape variation on garment fit evaluations of 30 UK
20 females aged 18-34. This aim will be achieved by answering the following research questions:
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28 **RQ1:** What are the various body shape typologies amongst 30 UK females aged 18-
29 34?
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33 **RQ2:** How do UK female body shape typologies compare with other cross-cultural
34 body shape studies?
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38 **RQ3:** Do UK females who share the same body shape classification experience
39 similar / dissimilar dress fit issues? If so, how do these fit issues vary between
40 body shape categories.
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47 This study helps scholars better understand the role of body shape within females' fit
48 evaluations and, in particular, whether females who share the same body shape classification
49 experience similar or dissimilar fit issues. This study aims to extend the current body shape
50 literature by exploring a UK demographic that has not previously been investigated. Moreover,
51 the call for greater representation of diverse body shapes through advertising is burgeoning
52 within fashion marketing (Mulgrew *et al.*, 2020). Consequently, the findings of this study offer
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3 fashion retailers novel insights into females' body shapes and the various fit problems
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5 experiences by different body shape classifications, which can better inform their promotional
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7 and marketing strategies.
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10 11 12 **2. Literature Review**

13 14 15 16 **2.1. Clothing fit**

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18 Clothing fit has been researched in numerous disciplines suggesting that it transcends the
19
20 realms of garment construction. Gupta (2020) acknowledges that an understanding of fit
21
22 diverges, from academics who research fit, garment technologists who confirm fit standards,
23
24 and consumers who appraise garment fit. Therefore, practitioners must deal with the
25
26 differences between academic, industry and consumer understandings of fit (Gill, 2015).
27
28 Definitions of garment fit have varied from how a garment looks on a consumer, to being
29
30 contingent upon fashion trends and one's self-perception (Song, Kim and Ashdown, 2021).
31
32 Gupta (2020) defines fit as the relationship between an individual and their clothing which
33
34 significantly affects wearers' self-esteem and comfort. This infers that fit is a subjective,
35
36 'consumer-centric attribute' based on individual partialities (Rieke *et al.*, 2016, p.208).
37
38 However, this comprehension of clothing fit should be taken with caution as it depicts clothing
39
40 fit as an arbitrary concept, which varies from person to person.
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46
47 Garment technologists measure fit through five objective criteria, specifically: ease,
48
49 line, grain, balance and set (Gill, 2015). Whilst these five criteria are useful in understanding
50
51 what influences the fit of a garment, appreciation of these standards is limited to a garment
52
53 technologist perspective. When investigating people's understanding of fit, Shin and Damhorst
54
55 (2018) found that participants did not refer to any objective terms of fit, suggesting that
56
57 consumers have limited understanding of such parameters when evaluating clothing fit.
58
59 Instead, McKinney and Shin (2016) unearthed four dimensions of fit evaluation from a
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1
2
3 consumer's perspective: aesthetic fit, physical fit, functional fit and social considerations,
4
5 which corroborates prior literature (Shin and Damhorst, 2018). Physical fit is the palpable
6
7 relationship between clothing and the body and includes parameters such as the tightness of a
8
9 product. Aesthetic fit is the visual perception of the product when the body is clothed
10
11 (Newcomb and Istook, 2011). Individuals evaluate functional fit when the clothed body is
12
13 moving. Finally, Shin and Damhorst (2018) found that when considering fit variables, young
14
15 females were also concerned about what others thought about the fit of a garment. Despite the
16
17 discrepancies in definitions, consensus is that fit is concerned with garment size and the
18
19 wearer's body shape (Zakaria, 2017). Hence, this study will adopt the definition of clothing fit
20
21 as the relationship of clothing to the body in terms of size and contour (Chen, 2007).
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30 **2.2. Female Body Shape**

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32 Although clothing fit is concerned with the relationship between the size of a garment and the
33
34 wearer's body shape (Zakaria, 2017), body shape is often omitted from retailers' marketing
35
36 communication of garment fit. Body shape is defined as the accumulation of a human skeletal
37
38 structure coupled with muscle and fat distribution on the body (Rasband and Liechty, 2006).
39
40 Currently, standard clothing sizes do not accommodate all body shapes, but rather assume a
41
42 standard body shape to which a set of sizes are proportionally graded up or down to fit most of
43
44 the population (Zakaria and Ruznan, 2020). Indeed, fashion retailers will select a fit model that
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46 they believe best represents the market, often size 12 in womenswear (Boardman, Parker-Strak
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48 and Henninger, 2020). However, as noted by Ashdown and Loker (2010), given that women
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50 have various body shapes, one fit model of a single body type cannot represent all people in
51
52 the target market as variation between body shapes determines how well a garment will fit
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54 (Sattar *et al.*, 2019). Consequently, academics recognise the importance of different body
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56 shapes in enhancing satisfaction with clothing fit (Lee *et al.*, 2007).
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3 Indeed, Apeageyi (2008) revealed that 85% of UK females claimed that identically
4
5 sized garments looked dissimilar on different body shapes and Carufel and Bye (2020) verified
6
7 that among US females aged 18-54, multiple body shapes existed across one clothing size.
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10 Furthermore, Rasband and Liechty (2006) disclosed that females with similar body shapes will
11
12 often wear the same clothing styles. This suggests that body shape is a vital moderator affecting
13
14 garment fit satisfaction. However, what remains unknown is whether females who share the
15
16 same body shape category experience similar fit evaluations, and in particular, which bodily
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18 areas are commonly addressed for each body shape category when reviewing the fit of a dress
19
20 physically. The present study aims to fill this gap in the literature through a mix-methods,
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22 physical garment try-on session.
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26 In summary, from reviewing the literature, it is apparent that body shape has been
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28 examined in two ways:
29

30 **(1) Objective Garment Technologist Perspective:** aims to develop body shape
31
32 categories to improve pattern construction.
33

34 **(2) Subjective Consumer Behaviour Perspective:** aims to explore the role of body
35
36 shape as a moderator within the decision-making process.
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40 41 **2.3. Body Shape Categorisation Methods**

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44 Scholars have explored body anthropometry to develop clothing patterns in an attempt to
45
46 improve garment fit. However, these approaches remain largely academic, and presently, the
47
48 application of these methods in a marketable context is lacking (Gill, 2015). Nevertheless,
49
50 several body shape categorisation methods were identified from evaluating the literature.
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56 *Insert table I here*
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3 Table I demonstrates that body shape categorisation methods are based on either (1) visual
4 analysis of body proportions from the front and side silhouettes or (2) proportions of body
5 circumferences. Connell *et al.* (2006) adopted the former method, developing nine scales for
6 Body Shape Assessment (BSAS) by visually analysing the relationship of the whole body to
7 the front and side views of 42 female body scans aged 22-55. The authors used the body scans
8 to analyse body builds based on posture, hip shape, front torso, buttock prominence, back
9 curvature and bust prominence. However, this approach does not offer a mathematical formula
10 to categorise body types, so the findings cannot be replicated globally. Furthermore, the visual
11 analysis method has been criticised for being inadequate as it is based on subjectivity (Song
12 and Ashdown, 2011), resulting in ambiguous results.
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26 Simmons *et al.* (2004) developed the Female Figure Identification Technique (FFIT)
27 body shape classification tool using a 3D body scanner. FFIT focuses on classifying female
28 body shapes based on the numerical ratios of the bust, waist, high hip, abdomen and hip to
29 develop the essential circumferential measurements used to determine body shape. The
30 researchers unveiled nine key body shape categories, namely: hourglass, rectangle, oval,
31 triangle, spoon, diamond, bottom hourglass, top hourglass and inverted triangle (Simmons *et*
32 *al.*, 2004), descriptions, measurement parameters and images of these body shapes can be found
33 in Appendix I. Whilst some have challenged the reliability of the FFIT method (Parker *et*
34 *al.*, 2021), it is widely regarded as the most accessible body shape classification method, and
35 its usefulness has been corroborated when exploring consumers' perception of body shape
36 globally, see Table II. Hence, this study will use the FFIT method to answer RQ1 and to
37 disclose the various body shapes prevalent amongst female participants within this study.
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Insert table II here

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3 It is apparent from Table II that the prominence of body shape categories diverges across
4 different countries and so, by answering RQ2 this research will investigate how UK body shape
5 typologies compare with prior cross-cultural body shapes found in existing research. Indeed, it
6 is evident from Table II that there is a lack of research investigating female body shapes in the
7 UK, with only one other study over nine years ago being identified (Grogan *et al.*, 2013),
8 emphasising that further investigation is required.
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18 **2.4. Body Shape Evaluation and Clothing Choices**

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21 Literature reveals that females use clothing to manage their self-perceived body shape. In a
22 content analysis of 15 historical texts (ranging from 1914-1961), Ridgway (2020) found that
23 using dress to manipulate body proportions was a dominant practice discussed throughout
24 literature. Academics have also found that females avoid certain clothing items due to their
25 self-perceived body shape. Indeed, Rahman (2015) found that participants who claimed to have
26 a pear body shape avoided wearing skinny jeans, as they believed that their body was not
27 slender enough. Moreover, Newcomb and Istook (2011) explored clothing fit preferences of
28 Mexican-American females and unveiled that, participants who self-reported as having a
29 diamond, oval, rectangle or triangle body shape were more likely to prefer loosely fitted tops.
30 These findings suggest that females are mindful of their body shape, which acts as a vital
31 moderator during their purchasing decision. However, it is essential to note that most studies
32 have assessed consumer fit appraisals using line drawings of garments or questionnaires, which
33 do not capture the palpable responses of consumers wearing the garment first-hand (Newcomb
34 and Istook. 2011). Thus, this study aims to add novel insights by undertaking a physical
35 investigation of the fit evaluations of females with different body shapes.
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3. Research Methods

3.1. Research Design

This study adopts a mixed-methods approach to investigate the impact of body shape variation on females' evaluation of dress fit. During a period of five months (January 08th -May 31st, 2019), 30 UK female participants, aged 18-34 were body scanned using a Size Stream scanner and objectively categorised into a body shape, using the FFIT parameters outlined by Lee *et al.*, (2007) (Appendix I). Upon completing the body scans, participants were asked to try-on a black bodycon dress in their usual clothing size. In order to reduce the aforementioned issue of non-standardised sizing, all of the dresses were purchased from the same clothing brand. To gain a deeper understanding of individuals' clothing fit appraisals, participants verbalised their fit experiences whilst wearing the dress through qualitative semi-structured interviews.

3.2. Sampling Strategy and Demographic Profiling

30 participants were recruited using a convenience sampling strategy, enabling the researcher to select participants based on criteria such as age, gender, and nationality to explore the research questions accordingly. An all-female sample was chosen for this study as FFIT categorises females' body shapes alone; thus, it was paramount that an all-female sample was used. A UK only sample was selected in order to investigate RQ2 as, to date, there is limited research investigating body shapes classifications within the UK (Grogan *et al.*, 2013). A sample size of 30 was deemed appropriate as not only does it supersede the average sample size used in prior mixed-methods body scanning research (Hernández, Mattila and Berglin, 2019), but it is also in line with previous studies that have undertaken semi-structured interviews (Nash, 2019). Participants were not incentivised for taking part in the research. It is also important to note, that the research team did not know the participants beforehand, as this may have impacted the reliability of the garment try-on.

3.3. *Pilot Study*

Four additional participants representative of the target population (UK females aged 18-34) were recruited using a non-probability convenience sampling strategy. The pilot study enabled the researcher to evaluate participants' reactions to the interview questions, body scanning and garment try-on process. From the pilot study, several issues emerged. Firstly, it was apparent that participants felt uncomfortable with the initial design structure of the research. Originally, participants were asked to try-on the dress and then undertake the body scanning process, however this appeared to enhance participants' body dissatisfaction. Alternatively, body scanning participants first and then asking them to undertake the garment try-on after reduced body dissatisfaction considerably evidenced by participants being more inclined to speak openly about their experiences with the fit of the dress. Therefore, to ensure that the participants were fully comfortable, the design was revised.

Secondly, it was also clear that once participants were shown their body scan, they would focus on specific areas of their body rather than considering their whole-body shape. Hence, to ensure the body scan image did not influence participants' responses during the try-on session, females were given the opportunity to see their body scan once the interview was terminated. The final issue that emerged was related to underwear as some participants wore a padded bra which alerted the fit of the dress considerably. Hence, to eliminate this issue in the main study, the participant information sheet requested participants to wear a non-padded bra.

3.4. *Body Scanning Procedure*

To investigate RQ1, 30 body scans were undertaken individually in a private room at the university following the university's ethical guidelines. On arrival, participants were informed of the body scanning process and completed three consent forms to ensure full agreement to take part within the study. One day prior to the session, participants were informed that they

1
2
3 needed to wear close fitting underwear as detailed on the information sheet. However,
4
5 appropriate underwear was made available to wear over or in place of the participants own,
6
7 should they not have close fitting underwear. Participants then entered the private body
8
9 scanning cubical where they undressed, leaving on their underwear, tied back their hair and
10
11 removed any jewellery, adhering to previous body scanning protocols (Hernández *et al.*, 2019).
12
13 The Size Stream body scanner captured 3D computer images of the body, which were then
14
15 generated as point cloud data, and an extensive list of bodily measurements extracted,
16
17 specifically, bust, waist, high hip, abdomen and hip. Body scanning is advantageous as it
18
19 overcomes the subjective limitations of manual measurement methods, ensuring that physical
20
21 measurements of the participants are reliable and reproducible (Reid *et al.*, 2020). A visual
22
23 inspection of all body scans was undertaken, and participants were rescanned if any issues were
24
25 present to ensure validity, in line with Grogan *et al.*, (2019). The total duration of the procedure
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27 was approximately 10 minutes.
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34 35 **3.5. Physical Garment Try-On and Semi-Structured Interviews**

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37 After the body scan, participants were instructed to try-on the bodycon dress in their usual
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39 clothing size. Appendix II provides an image of the dress. In line with Lee and Yu (2020) a
40
41 black bodycon was selected to minimise the effect of clothing attractiveness, personal
42
43 preference and recent fashion trends. The dress was available in sizes 4-18 and participants
44
45 were able to try the dress on in multiple sizes to ensure the participant was comfortable wearing
46
47 the dress for the full duration of the try-on session. Branded labels were removed from the dress
48
49 to allay any existing size preconceptions based on participants' prior experiences with the
50
51 brand. A bodycon dress was selected as this style of dress follows and emphasises the shape of
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53 the body (Hernández *et al.*, 2019), yet the stretch material ensured that participants felt comfortable.
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55 Physical try-ons were suitable as it is the standard method to examine clothing fit from an
56
57 industry perspective and is posited to be the most reliable evaluation method of garment fit
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(Hernández *et al.*, 2019). Hence, a comprehensive understanding of individuals' fit evaluations was necessary to examine whether females who have the same body shape experience similar / dissimilar dress fit issues and whether these fit issues vary between body shape categories (RQ3). To ensure the identity of participants remained confidential, participants were coded through the order of recruitment, age and body shape, for example, P.12 (order of recruitment), 22 (age), R (body shape).

Whilst wearing the bodycon dress, participants were asked semi-structured interview questions, adapted from existing literature, regarding its fit (McKinney and Shin, 2016). Appendix III demonstrates the interview guide. A final question was added to ensure that participants had no additional comments. Females were not informed of their body shape until after the interview as this may have influenced their responses. The try-on and interview lasted approximately 20-40 minutes. Saturation point was reached after 25 interviews; however, adhering to the recommendation of Lipson, Stewart and Griffiths (2020), a further five interviews were undertaken to ensure that no new themes emerged.

3.6. Data Analysis

The semi-structured interviews were audio-recorded and transcribed verbatim. The data was analysed adhering to the stages of thematic analysis outlined by Braun and Clarke (2006), which includes familiarisation of the dataset, generating initial codes, searching for critical themes, reviewing themes and refining the themes. Accordingly, a line-by-line coding technique was undertaken to identify initial themes and subthemes and then interview transcripts were coded to highlight the relationship between these themes (Grogan *et al.*, 2013). The body shape classifications of the participants (rectangle, hourglass, spoon, triangle and bottom hourglass) were used as main themes and key areas of the body such as stomach, bust, hips, thighs were organised into sub-themes. To reduce bias and enhance the reliability of the data, detailed records of the research process were maintained. The researchers conducted

multiple coding cycles (Boardman and McCormick, 2021), which involved each of the four research members individually coding the data initially. Then, each theme and sub-theme that emerged for each researcher were discussed, compared and corroborated to enhance transparency and reflexivity, adhering to Lipson, Stewart and Griffiths (2020).

4. Results and Discussion

4.1. *RQ1 What are the various body shape typologies amongst 30 UK females aged 18-34?*

The key circumferential measurement outputs from the 30 body scans (bust, waist, high hip, abdomen and hip) were fed through an excel spreadsheet to classify females body shapes using the FFIT System and parameters outlined by Lee *et al.*, (2007). Appendix IV provides a comprehensive list of participant codes and body shapes. From the 30 body scans, five body shapes typologies were unveiled including; triangle (N=1, 3.3%), bottom hourglass (N=13, 43.3%), hourglass (N=2, 6.7%), rectangle (N=10, 33.3%) and spoon (N=4, 13.3%), illustrated in Figure 1.

Insert figure 1 here

The main body shape category discovered was the bottom hourglass (N=13, 43.3%) followed by the rectangle (N=10, 33.3%). This finding partially challenges Grogan *et al.*, (2013), who found the hourglass to be the most prevalent body shape amongst UK females, aged 18-45, followed by the rectangle. Interestingly, although the inverted triangle, top hourglass and spoon body shape classifications were not discovered by Grogan *et al.* (2013), the spoon body shape was found to be the third most common body shape in this study. Hence, the findings of this

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2
3 study coupled with secondary data, appear to infer that the top hourglass and the inverted
4 triangle are not widely representative of the body shapes for UK females aged 18-34. Yet, as
5
6 both studies examined different age samples, the slight discrepancy regarding the spoon body
7
8 shape may be due to the fact that as women mature their body shapes change (Rahman and Yu,
9
10 2019).
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14 15 16 17 **4.2. RQ2 How do UK female body shape typologies compare with other cross-cultural** 18 19 **body shape studies?** 20

21 The body shape classifications uncovered within this study are somewhat similar to those found
22 across other countries and cultures. Yin and Annett-Hitchcock (2019) found the bottom
23 hourglass body shape to be the most noticeable amongst US females aged 18-35, which
24 correspond with the present study findings for UK females aged 18-34. Similarly, Lee *et*
25 *al.*, (2007) found that the inverted triangle and the top hourglass were the two least common
26 body shapes amongst American and Korean females, which is also true within this study.
27 Proceeding on a similar track, Lee *et al.*, (2007) found the spoon to be the second-largest body
28 shape of US females and the third-largest shape typology of Korean females. A more recent
29 study by Yin and Annett-Hitchcock, (2019) found that a spoon body shape was prevalent
30 amongst both Chinese and US females aged 18-35, a finding further corroborated by Ridgway
31 *et al.*, (2017). Similarly, Zhang *et al.*, (2017) found that the dominant body shape identified
32 amongst 24 European, American and Asian Americans was a spoon body shape. However,
33 within in this study, although the spoon body shape was identified, it was the third most
34 noticeable. Hence, the findings of this research support prior findings that country and cultural
35 context are crucial factors in body shape variations by adding new insights concerning a UK
36 demographic.
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3 Lastly, from the body scan analysis, it was apparent that the least common body shape
4 categories were the hourglass (N=2, 6.7%) and the triangle (N=1, 3.3%). This concurs with
5 prior studies that have also found the hourglass to be the least popular body shape. For instance,
6 Zhang *et al.*, (2017) discovered that only 1 (out of 24 females) had an hourglass body shape.
7 Similarly, Seo and Namwamba (2018) found that from 72 African-American females, only
8 4.2% had an hourglass body shape. These findings are further validated by Lee *et al.*, (2007),
9 who found that only 11% of US females and 0.5% of Korean females had an hourglass body
10 shape. Hence, in light of the aforementioned, it appears that the core body shape used by
11 retailers during the garment fit stage (Pisut and Connell, 2007; Apeagyei, 2008; Makhanya *et*
12 *al.*, 2014; Rieke *et al.*, 2016), in reality, represents a very small percentage of the global
13 population.
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31 **4.3. RQ3 Do females who share the same body shape classification experience similar fit** 32 **issues?** 33

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35 Females' evaluation of the physical fit of the dress are summarised in Table III.
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40 *Insert table III here*
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45 It appears from the quotes delineated in Table III that females who share the same body shape
46 classification experience similar fit issues with the bodycon dress, challenging Makhanya and
47 Mabuza (2020) who found that body shape did not influence apparel fit preference. For
48 example, participants who had a rectangular body shape either reported tightness issues at the
49 stomach area, “[...] *it's just too tight around my stomach area*” (P.0522R), or disclosed
50 satisfactory dress fit at key bodily areas, “[...] *the bust, hips and waist fit well*” (P.1221R),
51 which is noteworthy given that with rectangle body shapes the key bodily areas (bust, waist
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3 and hips) are portionally equal (Lee *et al.*, 2007). Alternatively, participants who had a bottom
4
5 hourglass body shape reported tightness issues at the hips and bum. For example, “*it’s*
6
7 *definitely tight across my hips and bum [...] you can see it pulling slightly at the front*”
8
9 (P.0122BHG). Interestingly, whilst participants who had a spoon body shape reported similar
10
11 tightness issues to participants who had a bottom hourglass body shape (i.e., bum and hips),
12
13 they expressed further tightness issues at their thighs, exemplified through the following
14
15 quotes, “*around my hips it is a bit tight and around my upper thigh [...]*” (P.2221SP) and “*I*
16
17 *think it’s around my stomach, hips and thighs [...] it’s just not flattering being this tight*”
18
19 (P.0830SP). This finding is unsurprising given the similar characteristics of the spoon and
20
21 bottom hourglass body shapes (see Appendix I for full body shape description), i.e., larger hip
22
23 circumferences (Lee *et al.*, 2007). However, a potential reason why participants with a spoon
24
25 body shape reported further fit issues at the thigh is highlighted by Simmons *et al.*, (2004), who
26
27 noted that females with a spoon body shape have wider thighs.
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33 Participants who had an hourglass body shape reported fit issues, particularly looseness,
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35 at the stomach area. For example, “[...] *it doesn’t fit as well around my stomach*” (P.0323HG),
36
37 which is surprising given that fashion retailers use the hourglass body classification during the
38
39 garment fit stage. However, this finding sustains that of Alexander *et al.*, (2005), who also
40
41 found that hourglass body types were likely to experience fit issues at the stomach.
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45 The aforementioned appears to support the proposition that females who share the same
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47 body shape classification experience similar fit issues, extending the literature by investigating
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49 a UK demographic, previously lacking. Although Grogan *et al.*, (2013) examined garment fit
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51 in relation to females’ body image in the UK, the authors did not report how different body
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53 shapes experienced various fit issues in relation to different areas of the body. Furthermore,
54
55 previous studies that have examined the relationship between garment fit and body shape have
56
57 often employed a survey method rather than allowing females with the same body shape to
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3 physically try-on dresses and evaluate the fit first-hand. This resulted in a gap in the literature
4
5 regarding subjective fit and a lack of understanding of how and why consumers experience fit
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7 in relation to their body shape, which only an in-depth qualitative inquiry would be able to
8
9 provide. By answering RQ3, the findings support the proposition that body shape is a crucial
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11 moderator affecting garment fit satisfaction, and so, body shape provision and commercial
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13 awareness of the main fit issues experienced by various body shapes are necessitated to assist
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15 females with their clothing decisions.
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23 **5. Research Implications, Conclusions and Future Research**

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25 By responding to Zakaria's (2017) call for research to explore consumers' evaluation of the fit
26
27 of the clothes they select through a physical garment appraisal, this study makes insightful
28
29 contributions by producing a rich set of data that probes why and how females who share the
30
31 same body shape classification experience dress fit, thereby addressing a gap in the literature.
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34 The study aimed to answer the following research questions:

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36 **RQ1:** What are the various body shape typologies amongst 30 UK females aged 18-
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38 34?

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40 **RQ2:** How do UK female body shape typologies compare with other cross-cultural
41
42 body shape studies?
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46 **RQ3:** Do UK females who share the same body shape classification experience similar
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48 / dissimilar dress fit issues? If so, how do these fit issues vary between body shape
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50 categories.
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55 The findings demonstrate that females who share the same body shape classification experience
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57 the same issues when appraising dress fit, challenging Makhanya and Mabuza (2020) who
58
59 found that body shape does not influence apparel fit satisfaction. For instance, within this
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3 study, all participants who had a rectangular body shape experienced tightness issues at the
4 stomach area, yet were satisfied with the fit at the bust and hips, whereas females who had a
5 spoon body shape experienced fit issues at the bum, hips and thighs. Moreover, females who
6 had a bottom hourglass body shape reported fit issues at the hips and bum, compared to females
7 with an hourglass body shape who emphasised the looseness of the dress at the stomach area.
8 The aforementioned sheds light on the importance of body shape during the fit appraisal
9 process. While this finding supports prior research that finds females with similar body shapes
10 will often wear the same clothing styles (Rasband and Liechty, 2006), this study extends the
11 literature by investigating how females with the same body shape experience garment fit and
12 also the key fit issues that arise for each body shape classification.
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26 Although the present study was conducted in the UK with a small sample (N=30), the
27 findings provide significant insights to fashion practitioners and academics globally by
28 comparing empirical results of this studies to existing cross-cultural body shape research
29 (RQ2). Indeed, by comparing the body shape findings of this study to that of prior research that
30 has also applied the FFIT method to investigate body shape from various cultural contexts, this
31 study supports the inference that female body shapes deviate across various cultures and
32 countries and so, brands who operate on a global scale must consider the various body shapes
33 that exist within their target audience and understand the unique fit issues for each body shape
34 classification.
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47 Moreover, this research offers novel methodological contributions to the clothing
48 appraisal literature. Most studies that have investigated consumers' garment fit appraisals have
49 used (1) a fit preference scale (Manuel *et al.*, 2010); (2) line drawings to depict various types
50 of garment fit (Alexander *et al.*, 2005); or (3) explored consumers' experiences with fit through
51 qualitative interviews (Makhanya and Mabuza, 2020) or questionnaires. A limitation of such
52 approaches is that they do not permit consumers to try-on the garment and evaluate the fit first-
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3 hand (Newcomb and Istook, 2011). To overcome these limitations, this study undertook a
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5 garment try-on session which enabled an in-depth exploration of garment fit on various body
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7 shapes, emulating the industry practice of live fitting sessions. Moreover, it was apparent from
8
9 the pilot study that the process of trying-on the dress first, followed by the body scan enhanced
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11 consumers' body dissatisfaction. Hence, academics researching body shape should emulate the
12
13 order of this research design to ensure participants are comfortable during the data collection
14
15 process.
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19 Additionally, prior research considering the relationship between female body shapes
20
21 and clothing choices required participants to self-report their perceived body shape (Makhanya
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23 and Mabuza, 2020), which has proven to be highly subjective. Objective body shape
24
25 categorisation methods are vital for identifying female body shapes based on human data (Seo
26
27 and Namwamba, 2018). Hence, through a mixed-method inquiry, the findings of this study
28
29 emphasise the need to further incorporate digital methods, such as body scanning, into research
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31 methodologies to make better-informed body shape classifications that can be applied in future
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33 studies.
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38 Although there are existing body shape classification studies, research investigating
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40 how females with the same body shape experience garment fit from a UK perspective is
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42 incomplete, with only one study carried out by Grogan *et al.* (2013), which examined the
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44 relationship between females' body shape and body image. Hence, by conducting body
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46 scanning sessions followed by a garment try-on, this study offers updated insight into UK
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48 female body shape typologies and how current Ready-To-Wear dresses fit these different body
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50 shape classifications, filling a gap within the body shape literature.
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54 The findings also have practical implications for fashion retailers. Currently, the most
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56 common way to communicate clothing fit information is through sizing labels. However, this
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58 widely accepted communication strategy does not consider body shapes. Moreover, retailers
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3 do not currently accommodate for various body shapes in their fit communications with
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5 consumers, with the hourglass body shape being predominantly used in Western fashion
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7 promotional strategies. Hence, the findings of the present study shed light on the role of body
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9 shape in determining satisfactory clothing fit, and how females' fit experiences will differ
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11 depending on their body shape classification. Thus, fashion retailers should use this insight to
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13 better inform their promotional strategies, not only making them more inclusive but also to
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15 help assist this particular consumer segment with their clothing decisions based on their body
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17 shape.
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22 Despite the contribution, future research to improve the limitations should be
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24 addressed. Firstly, although it was necessary to investigate a UK demographic to address
25
26 research gaps, the finding of this study cannot be generalised to the entire female UK
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28 population, nor to other areas of the world. Hence, future research should overcome this
29
30 limitation by extending this study further to other countries, cultures and ethnicities. Indeed,
31
32 although the prominence of body shape categories across various countries diverges, the same
33
34 body shape typologies identified from the FFIT method have been found in several
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36 contexts. Another limitation is that this study used the FFIT method to classify body shape
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38 which has been challenged in terms of its reliability in recent times (Parker *et al.*, 2021).
39
40 Therefore, future studies could replicate the present study employing other body shape
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42 classification methods. Nevertheless, to date, the FFIT method is the most accessible body
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44 shape classification, with prior studies verifying its usefulness when exploring consumers'
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46 perception of body shape (Gill, 2015; Yin and Annett-Hitchcock, 2019).
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52 To conclude, the present study provides an in-depth understanding of how females with
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54 the same body shape experience garment fit, contributing novel findings to the literature
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56 through a mixed-method inquiry previously lacking in this area, with a UK demographic which
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58 has not previously been explored.
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12

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58
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60

References

- Alexander, M., Connell, L.J. and Presley, A.B. (2005). 'Clothing fit preferences of young female adult consumers', *International Journal of Clothing Science and Technology*, Vol. 7 No. 1, pp.52-64.
- Alexander, M., Pisut, G., and Ivanescu, A. (2012). 'Investigating women's plus-size body measurement and hip shape variation based on SizeUSA data', *International Journal of Fashion Design, Technology and Education*, Vol. 5 No. 1, pp.3-12.
- Apeageyi, P. (2008). 'Significance of body image among UK female fashion consumers: the cult of size zero, the skinny trend', *International Journal of Fashion Design, Technology and Education*, Vol. 1 No. 1 pp.3-11.
- Ashdown, S., and Loker, S. (2010). 'Mass-customized Target Market Sizing: Extending the Sizing Paradigm for Improved Apparel Fit', *Fashion Practice: The Journal of Design, Creative Process and The Fashion Industry*, Vol. 2 No. 2, pp.147-173.
- Boardman, R., and McCormick, H. (2021). 'Attention and behaviour on fashion retail websites: an eye-tracking study', *Information Technology and People*. Early cite: <https://www.emerald.com/insight/content/doi/10.1108/ITP-08-2020-0580/full/html>
- Boardman, R., Parker-Strak, R., and Henninger, C. E., (2020), *Fashion Buying and Merchandising: The Fashion Buyer in a Digital Society*, Routledge, UK.
- Braun, V., and Clarke, V. (2006). 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, Vol. 3 No. 2, pp.77-101.
- Carufel, R., and Bye, E. (2020). 'Exploration of the body-garment relationship theory through the analysis of a sheath dress', *Fashion and Textiles*, Vol. 7 No. 22, pp.1-28.

- 1
2
3 Chen, C. (2007). 'Fit evaluation within the made-to-measure process', *Journal of Clothing*
4 *Science and Technology*, Vol. 19, No. 2, pp.131-144.
5
6
7
8
9 Connell, L.J., Ulrich, P.V., Brannon, E.L., Alexander, M., and Presley, A.B. (2006). 'Body
10 Shape Assessment Scale: Instrument Development for Analysing Female Figures',
11 *Clothing and Textiles Research Journal*, Vol. 24, No. 2, pp.80- 95.
12
13
14
15 Gill, S. (2015). 'A Review of research and Innovation in garment sizing, prototyping and
16 Fitting', *Textile Progress*, Vol. 47, No. 1, pp.1-85.
17
18
19
20 Grogan, S., Gill, S., Brownbridge, K., Kilgariff, S., and Whalley, A. (2013). 'Dress fit and
21 body image: a thematic analysis of women's accounts during and after trying on
22 dresses', *Body Image*, Vol. 10, No. 3, pp.380-388.
23
24
25
26
27 Grogan, S., Storey, E., Brownbridge, K., Gill, S., Templeton, C., Gill, J., Persson, S., and
28 Armitage, C.J., (2019). 'Whole body scanning as a tool for clothing sizing: effects on
29 women's body satisfaction', *The Journal of The Textile Institute*, Vol. 111, No. 6,
30 pp.1-7.
31
32
33
34
35
36 Gupta, D. (2020). "New directions in the field of anthropometry, sizing and clothing fit".
37 Zakaria, N. and Gupta, D. (Ed.), *Anthropometry, Apparel Sizing and Design*,
38 Woodhead Publishing, United Kingdom, UK, pp. 3-27.
39
40
41
42
43 Hernandez, N., Mattila, H., and Berglin, L. (2019). 'Can Virtually Trying on Apparel Help in
44 Selecting the Correct Size?', *Clothing and Textiles Research Journal*, Vol. 37, No. 4,
45 pp. 249-264.
46
47
48
49
50 Lee, J.Y., Istook, C., Nam, Y., and Park, S.M. (2007). 'Comparison of body shape between
51 USA and Korean Women', *International Journal of Clothing Science and*
52 *Technology*, Vol. 19, No. 5, pp.374-391.
53
54
55
56
57 Lee, K.S., Song, H.K., and Kim, S. (2020). 'Categorization of lower body shapes of
58 abdominal obese men using a script-based 3D body measurement software', *Fashion*
59 *and Textiles*, Vol. 7, No. 3, pp.2-16.
60






- 1
2
3
4
5 Lee, H., and Xu, Y. (2020). 'Classification of virtual fitting room technologies in the fashion
6 industry: from the perspective of consumer experience', *International Journal of*
7 *Fashion Design, Technology and Education*, Vol. 13, No. 1, pp.1-10.
8
9
10
11
12 Lipson, S.M., Stewart, S., and Griffiths, S. (2020). 'Athleisure: A qualitative investigation of
13 a multi-billion-dollar clothing trend', *Body Image*, Vol. 32, pp.5-13.
14
15
16
17 Makhanya, B.P., Klerk, H.M., Adamski, K. and Mastamet-Mason, A. (2014). 'Ethnicity, body
18 shape differences and female consumers' apparel fit problems', *International Journal*
19 *of Consumer Studies*, Vol. 38, No. 2, pp.183-191.
20
21
22
23
24 Makhanya, B.P., and Mabuza, D.C. (2020). 'Body cathexis and fit preferences of young
25 south African women of different body shapes and ethnicity', *International Journal of*
26 *Fashion Design, Technology and Education*, Vol. 13, No. 2, pp.173-180.
27
28
29
30
31 McKinney, E., and Shin, E. (2016). 'Exploring criteria consumers use in evaluating their
32 online formal wear rental experience: A content analysis of online reviews', *Clothing*
33 *and Textiles Research Journal*, Vol. 34, No. 4, pp.272-286.
34
35
36
37
38 Manuel, M.B., Connell, L.J. and Presley, A.B. (2010). 'Body shape and fit preference in body
39 cathexis and clothing benefits sought for professional African-American women',
40 *International Journal of Fashion Design, Technology and Education*, Vol. 3 No. 1,
41 pp.25-32.
42
43
44
45
46
47 Mulgrew, K.E., Schulz, K., Norton, O., and Tiggeman, M. (2020). 'The effect of thing and
48 average-sized models on women's appearance and functionally satisfaction: does pose
49 matter?', *Body Image*, Vol. 32, pp.128-135.
50
51
52
53
54 Nash, J. (2019). 'Exploring how social media platform influence fashion consumer decisions
55 in the UK retail sector', *Journal of Fashion Marketing and Management: An*
56 *International Journal*, Vol. 23, No. 1, pp.82-103.
57
58
59
60

- 1
2
3 Newcomb, E., and Istook, C. (2011). 'Confronting stereotypes: apparel fit preferences of
4 Mexican-American women', *Journal of Fashion Marketing and Management: An*
5 *International Journal*, Vol. 15 No. 4, pp.389-411.
6
7
8
9
10 Parker, C.J., Hayes, S.G., Brownbridge, K., and Gill, S. (2021). 'Assessing the female figure
11 identification technique's reliability as a body shape classification system',
12 *Ergonomics*, Vol. 64 No.8, pp.1035-1051.
13
14
15
16
17 Pisut, G., and Connell, L.J. (2007). 'Fit preferences of female consumers in the USA',
18 *Journal of Fashion Marketing and Management: An International Journal*, Vol. 11,
19 No. 3, pp.366-379.
20
21
22
23
24 Rahman, O. (2015). 'Denim Jeans: A Qualitative Study of Product Cues, Body Type and
25 Appropriateness of Use', *The Journal of Design, Creative Process and the Fashion*
26 *Industry*, Vol. 7 No.1, pp.53-74.
27
28
29
30
31 Rahman, O., and Yu, H. (2019). 'Key antecedents to the shopping behaviours and
32 preferences of aging consumers: a qualitative study', *Journal of Fashion Marketing*
33 *and Management: An International Journal*, Vol. 23 No. 2, pp.193-208.
34
35
36
37
38 Rasband, J.A., and Liechty, E. (2006). *Fabulous Fit: Speeding Fit and Alternation*. Fairchild
39 Publication, Inc.
40
41
42
43 Reid, L.F., Vignali, G., Barker, K., Chrimes, C. and Vieira, R., (2020). "Three-Dimensional
44 Body Scanning in Sustainable Product Development: An Exploration of the Use of
45 Body Scanning in the Production and Consumption of Female Apparel", Vignali, G.,
46 Reid, L.F., Ryding, D., Henninger, C.E. (Ed.), *Technology-Driven Sustainability*
47 *Innovation in the Fashion Supply Chain*. Palgrave Macmillan, Cham, United
48 Kingdom, UK.
49
50
51
52
53
54
55 Ridgway, J.L. (2020). 'The "Use of Lines in Your Clothing Will Work Magic": Advice to
56 Women From 1914 to 1961 on Using Line to Design an Ideal Body Type', *Clothing*
57 *and Textiles Research Journal*, Vol. 38 No. 4, pp.270-284.
58
59
60

- 1
2
3 Ridgway, J.L., Parsons, J., and Sohn, M. (2017). 'Creating a more ideal self through the use
4 of clothing: An exploratory study of women's perceptions of optical illusion
5 garments', *Clothing and Textiles Research Journal*, Vol. 35 No.2, pp.111-127.
6
7
8
9
- 10 Rieke, S., Fowler, D., Chang, H., and Velikova, N. (2016). 'Exploration of factors
11 influencing body image satisfaction and purchase intention: Millennial females',
12 *Journal of Fashion Marketing and Management: An International Journal*, Vol. 20
13 No. 2, pp.208-229.
14
15
16
17
18
- 19 Sattar, H., Pons-Moll, G., and Fritz, M. (2019). "Fashion is Taking Shape: Understanding
20 Clothing Preference Based on Body Shape from Online Sources", in: 2019 IEEE
21 *Winter Conference on Applications of Computer vision (WACV)*, 968-977. IEEE
22 (January, 2019).
23
24
25
26
27
- 28 Seo, J.I., and Namwamba, G.W. (2018). 'Fit issues in ready-to-wear clothing for African-
29 American female college students based on the body shapes', *International Journal of*
30 *Fashion Design, Technology and Education*, Vol. 11 No. 2, pp.160-168.
31
32
33
- 34 Sheldon, W.H., Stevens, S.S., and Tucker, W.B. (1940). *The Varieties of Human Physique:*
35 *An Introduction to Constitutional Psychology*. Harper and Brothers: New York.
36
37
38
- 39 Shin, E., and Damhorst, M.L. (2018). 'How young consumers think about clothing fit?',
40 *International Journal of Fashion Design, Technology and Education*, Vol. 11 No. 3,
41 pp.352-361.
42
43
44
45
- 46 Simmons, K., Istook, C.L. and Devarajan, P. (2004). 'Female Figure Identification Technique
47 (FFIT) For Apparel Part I: Describing Female Shapes', *Journal of Textile and*
48 *Apparel, Technology and Management*, Vol.4 No.1, pp.1-16.
49
50
51
52
- 53 Song, H.K., and Ashdown, S.P. (2011). 'Categorization of lower body shapes for adult
54 females based on multiple view analysis', *Textile Research Journal*, Vol. 81 No. 9,
55 pp.914-931.
56
57
58
59
60

- 1
2
3 Song, H.K., Kim, Y. and Ashdown, S.P. (2021). 'Expert versus Novice Assessment of
4 Clothing Fit; an Exploratory Study Using Eye Tracking Technology', *Fashion*
5 *Practice*, Vol. 13 No.2, pp.227-252.
6
7
8
9
10 Yin, L., and Annett-Hitchcock, K. (2019). 'Comparison of body measurements between
11 Chinese and U.S. females', *The Journal of The Textile Institute*, Vol. 110 No.12,
12 pp.1716-1724.
13
14
15
16
17 Zakaria, N. (2017). "Evaluation of fit and size", Nayak, R., Padhye, R. (Ed.) *Manikins for*
18 *Textile Evaluation*, Woodhead Publishing Series in Textiles, pp.89-113.
19
20
21
22 Zakaria, N., and Ruznan, W.S. (2020). "Developing apparel sizing system using
23 anthropometric data: Body size and shape analysis, key dimensions, and data
24 segmentation", Zakaria, N., Gupta, D. (Ed.), *Anthropometry, Apparel Sizing and*
25 *Design*, Woodhead Publishing, pp. 91-121.
26
27
28
29
30
31 Zhang, L., Shin, E., Hwang, C., and Baytar, F. (2017). 'The Use of 3D body scanning
32 technology to assess the effectiveness of shape wear: changes in body shape and
33 attractiveness', *International Journal of Fashion Design, Technology and*
34 *Education*, Vol. 10 No. 2, pp.190-199.
35
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Appendix I

Body Shape	Description	Measurement parameters
 Hourglass	Proportional at the bust and hips with a defined waistline.	$(bust-hips) \leq 1$ $(hips-bust) < 3.6$ $(bust-waist) > 9$ Or $(hips-waist) > 10$
 Bottom Hourglass	Subcategory of the hourglass shape. Definite waist-line with larger hip circumference than bust circumference.	$(hips-bust) > 3.6$ and $(hips-bust) < 10$ $(hips-waist) > 9$ $(high\ hip/waist) < 1.193$
 Spoon	Larger circumferential difference in bust and hips and bust-to-waist ratio is lower than the hourglass shape and high hip to waist ratio is great.	$(hips-bust) > 2$ $(hips-waist) > 7$ $(high\ hip/waist) > 1.193$
 Rectangle	No visibly defined waist line, rather the bust, waist and hips are in line with each other.	$(hips-bust) < 3.6$ and $(bust-hips) < 3.6$ $(bust-waist) < 9$ and $(hips-waist) < 10$
 Triangle	Larger in the hips than the bust without having a defined waist.	$(hips-bust) > 3.6$ $(hips-waist) < 9$

Source: Simmons, Istook and Devarajan (2004) and Lee *et al.*, (2007).

Appendix II. Black Dress



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3 **Appendix III. Interview Guide**
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Questions	Probing questions	Follow-up Questions	References
1. How would you review the fit of the dress?	1a. Does it feel tight or loose anywhere? 1b. How do specific features of the garment feel?	That's interesting, please can you tell me a bit more about that?	McKinney and Shin (2016).
2. What problems if any do you experience with the fit of the dress?	2a. In relation to the key areas of your body (bust, hips, waist) how do you find the fit?	That's interesting, please can you tell me a bit more about that?	Grogan <i>et al.</i> , (2013); McKinney and Shin, 2016).
3. How does your body feel in the dress?	3a. Does the dress emphasise and conceal any areas of your body?	That is interesting, please can you tell me a bit more about that?	Grogan <i>et al.</i> , (2013).
4. Do you feel comfortable in the dress?	4a. Do you feel like you can move in the dress?	That is interesting, can you tell me a bit more about that?	McKinney and Shin, 2016).

Appendix IV. Body Shape Classifications and Participants Codes

Participant Code	Age	Nationality	Gender	Body Shape
P.0122BHG	22	UK	Female	Bottom Hourglass
P.0231BHG	31	UK	Female	Bottom Hourglass
P.0323HG	23	UK	Female	Hourglass
P.0423BHG	23	UK	Female	Bottom Hourglass
P.0522R	22	UK	Female	Rectangle
P.0628BHG	28	UK	Female	Bottom Hourglass
P.0722BHG	22	UK	Female	Bottom Hourglass
P.0830SP	30	UK	Female	Spoon
P.0924TRI	24	UK	Female	Triangle
P.1029BHG	29	UK	Female	Bottom Hourglass
P.1121R	21	UK	Female	Rectangle
P.1222R	22	UK	Female	Rectangle
P.1323SP	23	UK	Female	Spoon
P.1422BHG	22	UK	Female	Bottom Hourglass
P.1521R	21	UK	Female	Rectangle
P.1633R	33	UK	Female	Rectangle
P.1731R	31	UK	Female	Rectangle
P.1833BHG	33	UK	Female	Bottom Hourglass
P.1925BHG	25	UK	Female	Bottom Hourglass
P.2021SP	21	UK	Female	Spoon
P.2133BHG	33	UK	Female	Bottom Hourglass
P.2221SP	21	UK	Female	Spoon
P.2321R	21	UK	Female	Rectangle
P.2420R	20	UK	Female	Rectangle
P.2523R	23	UK	Female	Rectangle
P.2622BHG	22	UK	Female	Bottom Hourglass
P.2726R	26	UK	Female	Rectangle
P.2821HG	21	UK	Female	Hourglass
P.2922BHG	22	UK	Female	Bottom Hourglass
P.3023BHG	23	UK	Female	Bottom Hourglass

Method	Explanation	Applications	Limitations
Somatometry Sheldon <i>et al.</i> , (1940)	Photographed participants from 3 perspectives.	Douty <i>et al.</i> , (1974); Feather <i>et al.</i> , (1996).	Measurements of the back and side view only.
FFIT Simmons, Istook and Devarajan, (2004)	Calculated circumference measurement ratios between the bust, waist, high hip, hip and abdomen.	Lee <i>et al.</i> , (2007); Grogan <i>et al.</i> , (2013); Seo and Namwamba (2018).	Does not consider height and length.
Body Shape Assessment Scale (BSAS) Connell <i>et al.</i> , (2006)	Visual analysis based on measurements of posture, hip shape, front torso, buttock prominence, back curvature and bust prominence.	Connell <i>et al.</i> , (2006); Alexander <i>et al.</i> , (2012).	Analysing width and depth are not adequate when the body is circumferential (Song and Ashdown, 2011).
Figure Types Rasband and Liechty (2006)	Identification based on specific areas of the body where weight accumulated.	Yoo (2003).	Subjective approach based on visual appraisal.
Multiple Regression	Utilises two bodily dimensions and measures the drop (the difference between the two dimensions) to devise a body type.	Sizing systems.	Does not accommodate for shape variation (Kasambala <i>et al.</i> , 2016).

Table I. Summary of Existing Body Shape Categorisation Techniques.

Author	Sample	Findings
Lee <i>et al.</i> , (2007)	6,310 US, 1,799 Korean Females	US Females: 11.8% hourglass, 49% rectangle. Korean Females: 0.5% hourglass, 70.6% rectangle
Grogan <i>et al.</i> , (2013)	20 UK females	40% hourglass 30% rectangle
Makhanya <i>et al.</i> , (2014)	109 African, 125 Caucasian females	Caucasian Females: 40% hourglass African Females: 58.7% triangle.
Zhang <i>et al.</i> , (2017)	24 Europeans, Americans & Asian	Body shapes before shapewear: spoon, rectangle, bottom hourglass.
Ridgway <i>et al.</i> , (2017)	15 US, Caucasian, Asian, American females	Hourglass (N=5), Rectangle (N=5), Spoon (N=5)
Seo and Namwamba (2018)	72 African-American females	73.6% had a pear body shape. 4.2% had an hourglass body shape.
Yin and Annett-Hitchcock (2019)	400 Chinese & 340 US females, 18-35.	Chinese: 57% spoon, 26% bottom hourglass. US: 44% bottom hourglass, 22% spoon.

Table II. Previous Application of FFIT.





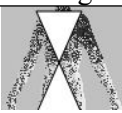
Body Shape	Findings
 <p>Rectangle</p>	<p>“[...] like the bust, hips and waist fit well” (P.1221R) “[...] is very tight around my stomach area” (P.1731R) “[...] the waist is just a bit constrictive” (P.1521R) <i>“It’s just too tight around my stomach area but the rest is ok”</i> (P.0522R)</p>
 <p>Bottom Hourglass</p>	<p><i>“Just around the hip area it was a little bit tight and the bum area”</i> (P.0628BHG) <i>“Sitting down, it’s not as comfortable because it is tighter on my bum and hips”</i> (P.1422BHG) <i>“The fit around my hips feels quite tight but it’s like as you would expect”</i> (P.3023BHG)</p>
 <p>Spoon</p>	<p><i>“I think it’s around my stomach, hips and thighs [...] it’s just not flattering being this tight”</i> (P.0830SP) <i>“In terms of around my hips it is a bit tight and around my upper thigh, like sitting down it’s quite tight”</i> (P.2221SP)</p>
 <p>Triangle</p>	<p>“[...] the stomach area feels a bit tight” (P.0924TRI)</p>
 <p>Hourglass</p>	<p><i>“It’s nicely fitted on the top and on my legs and on my waist area, [...] but at my stomach area it’s a bit baggy [...] it doesn’t fit as well around my stomach”</i> (P.0323HG) <i>“[...] it does fit quite nicely on all the parts. But it was a bit baggy [on the stomach]”</i> (P.2821HG)</p>

Table III. Fit Experiences

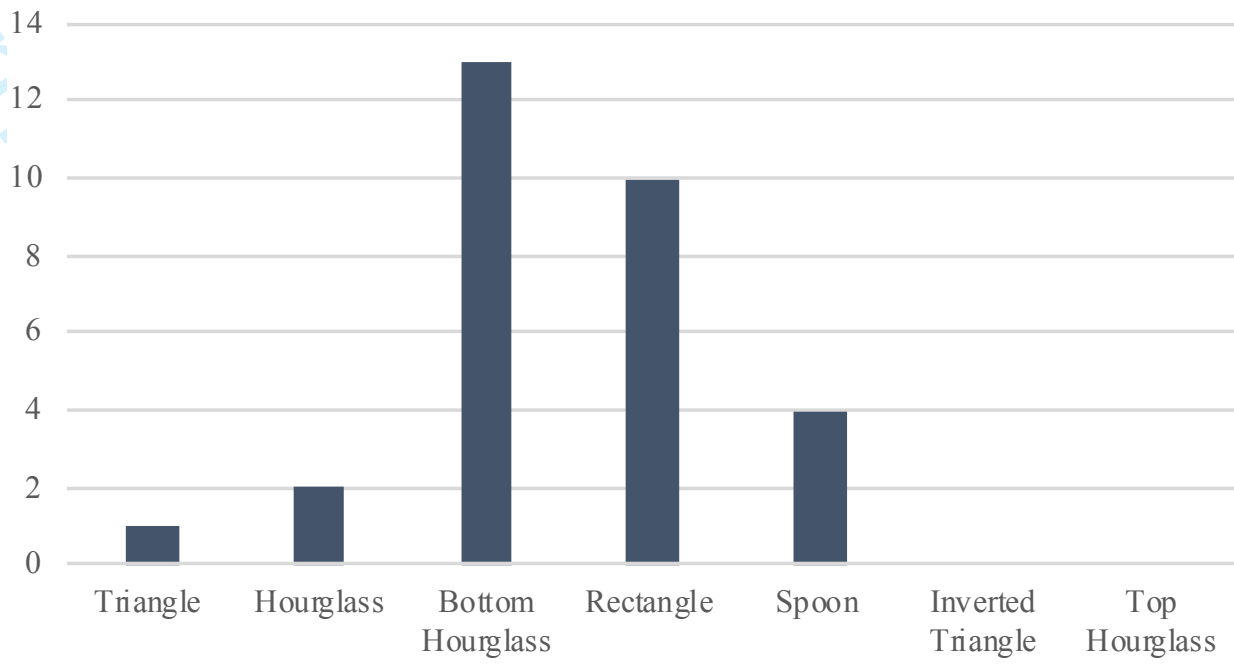


Figure 1. Body Shape Typologies