

# Investigating The Impact of Body Shape on Garment Fit

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### Investigating The Impact of Body Shape on Garment Fit

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## Investigating The Impact of Body Shape on Garment Fit

### 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-  
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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**

17  
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).  
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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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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  
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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  
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11 (Newcomb and Istook, 2011). Individuals evaluate functional fit when the clothed body is  
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13 moving. Finally, Shin and Damhorst (2018) found that when considering fit variables, young  
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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  
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19 wearer's body shape (Zakaria, 2017). Hence, this study will adopt the definition of clothing fit  
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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  
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34 wearer's body shape (Zakaria, 2017), body shape is often omitted from retailers' marketing  
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36 communication of garment fit. Body shape is defined as the accumulation of a human skeletal  
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38 structure coupled with muscle and fat distribution on the body (Rasband and Liechty, 2006).  
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40 Currently, standard clothing sizes do not accommodate all body shapes, but rather assume a  
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42 standard body shape to which a set of sizes are proportionally graded up or down to fit most of  
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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  
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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 sized garments looked dissimilar on different body shapes and Carufel and Bye (2020) verified  
5 that among US females aged 18-54, multiple body shapes existed across one clothing size.  
6  
7 Furthermore, Rasband and Liechty (2006) disclosed that females with similar body shapes will  
8 often wear the same clothing styles. This suggests that body shape is a vital moderator affecting  
9 garment fit satisfaction. However, what remains unknown is whether females who share the  
10 same body shape category experience similar fit evaluations, and in particular, which bodily  
11 areas are commonly addressed for each body shape category when reviewing the fit of a dress  
12 physically. The present study aims to fill this gap in the literature through a mix-methods,  
13 physical garment try-on session.  
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26 In summary, from reviewing the literature, it is apparent that body shape has been  
27 examined in two ways:  
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30 **(1) Objective Garment Technologist Perspective:** aims to develop body shape  
31 categories to improve pattern construction.  
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34 **(2) Subjective Consumer Behaviour Perspective:** aims to explore the role of body  
35 shape as a moderator within the decision-making process.  
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### 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 improve garment fit. However, these approaches remain largely academic, and presently, the  
46 application of these methods in a marketable context is lacking (Gill, 2015). Nevertheless,  
47 several body shape categorisation methods were identified from evaluating the literature.  
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*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  
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5 different countries and so, by answering RQ2 this research will investigate how UK body shape  
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7 typologies compare with prior cross-cultural body shapes found in existing research. Indeed, it  
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9 is evident from Table II that there is a lack of research investigating female body shapes in the  
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11 UK, with only one other study over nine years ago being identified (Grogan *et al.*, 2013),  
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13 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  
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23 content analysis of 15 historical texts (ranging from 1914-1961), Ridgway (2020) found that  
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25 using dress to manipulate body proportions was a dominant practice discussed throughout  
26  
27 literature. Academics have also found that females avoid certain clothing items due to their  
28  
29 self-perceived body shape. Indeed, Rahman (2015) found that participants who claimed to have  
30  
31 a pear body shape avoided wearing skinny jeans, as they believed that their body was not  
32  
33 slender enough. Moreover, Newcomb and Istook (2011) explored clothing fit preferences of  
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35 Mexican-American females and unveiled that, participants who self-reported as having a  
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37 diamond, oval, rectangle or triangle body shape were more likely to prefer loosely fitted tops.  
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39 These findings suggest that females are mindful of their body shape, which acts as a vital  
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41 moderator during their purchasing decision. However, it is essential to note that most studies  
42  
43 have assessed consumer fit appraisals using line drawings of garments or questionnaires, which  
44  
45 do not capture the palpable responses of consumers wearing the garment first-hand (Newcomb  
46  
47 and Istook. 2011). Thus, this study aims to add novel insights by undertaking a physical  
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49 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

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3 needed to wear close fitting underwear as detailed on the information sheet. However,  
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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  
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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 **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  
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41 black bodycon was selected to minimise the effect of clothing attractiveness, personal  
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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  
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47 the dress for the full duration of the try-on session. Branded labels were removed from the dress  
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49 to allay any existing size preconceptions based on participants' prior experiences with the  
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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  
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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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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  
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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  
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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  
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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  
46  
47 body shape classification experience similar fit issues, extending the literature by investigating  
48  
49 a UK demographic, previously lacking. Although Grogan *et al.*, (2013) examined garment fit  
50  
51 in relation to females’ body image in the UK, the authors did not report how different body  
52  
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  
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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  
10  
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**

24  
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:

35  
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  
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42 body shape studies?  
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46 **RQ3:** Do UK females who share the same body shape classification experience similar  
47  
48 / dissimilar dress fit issues? If so, how do these fit issues vary between body shape  
49  
50 categories.  
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55 The findings demonstrate that females who share the same body shape classification experience  
56  
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  
10  
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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18  
19 Additionally, prior research considering the relationship between female body shapes  
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21 and clothing choices required participants to self-report their perceived body shape (Makhanya  
22  
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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37  
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  
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26 research gaps, the finding of this study cannot be generalised to the entire female UK  
27  
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,  
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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  
35  
36 contexts. Another limitation is that this study used the FFIT method to classify body shape  
37  
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  
53  
54 the same body shape experience garment fit, contributing novel findings to the literature  
55  
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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## 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**





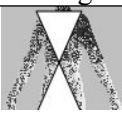
<b>Participant Code</b>	<b>Age</b>	<b>Nationality</b>	<b>Gender</b>	<b>Body Shape</b>
P.0122BHG	22	UK	Female	Bottom Hourglass
P.0231BHG	31	UK	Female	Bottom Hourglass
P.0323HG	23	UK	Female	Hourglass
P.0423BHG	23	UK	Female	Bottom Hourglass
P.0522R	22	UK	Female	Rectangle
P.0628BHG	28	UK	Female	Bottom Hourglass
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
<b>Somatometry</b> 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.
<b>FFIT</b> 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.
<b>Body Shape Assessment Scale (BSAS)</b> 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).
<b>Figure Types</b> Rasband and Liechty (2006)	Identification based on specific areas of the body where weight accumulated.	Yoo (2003).	Subjective approach based on visual appraisal.
<b>Multiple Regression</b>	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).

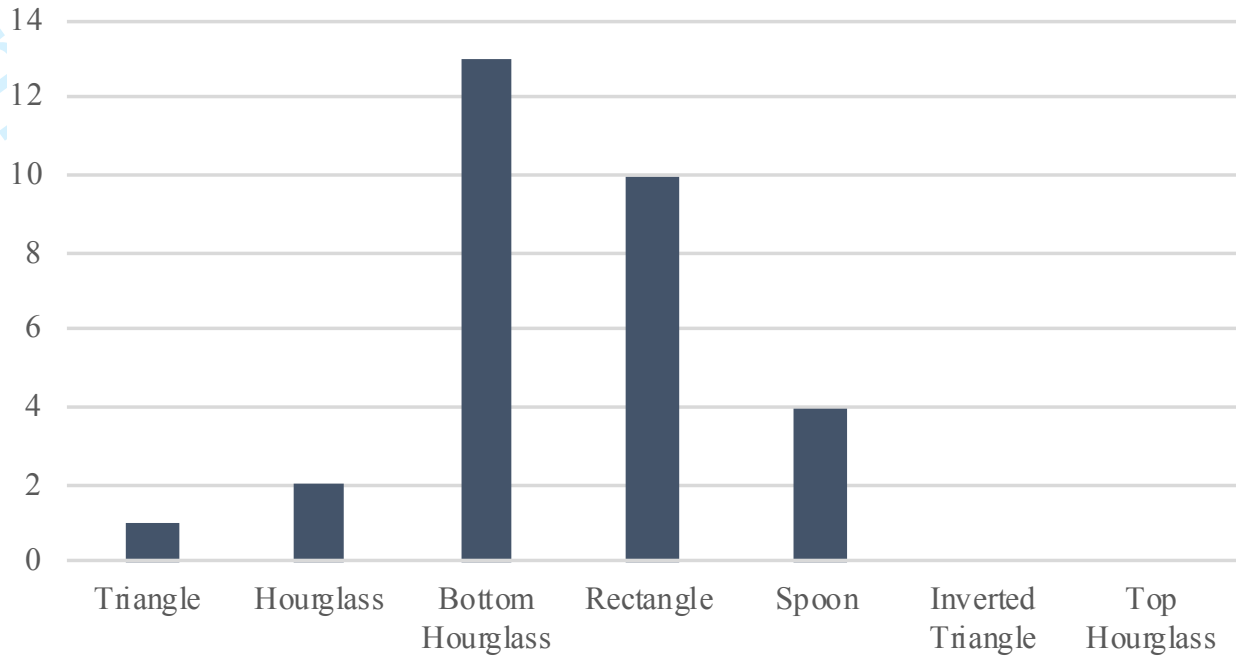
**Table I.** Summary of Existing Body Shape Categorisation Techniques.

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

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