

# “Accentuate the positive”: investigating knitwear for the 3D body shape of larger women

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## Introduction

This research aims to achieve a better understanding of fully fashioned weft knitting related to individual, larger, 3D bodies. By developing knitting processes using a widely available Shima Seiki flat bed machine, accessible and transferable results are being produced.

It also challenges the universality of the size 12 woman which has been disproved by SizeUK findings (Shabi), and the horror of fat which is demonstrated from haute couture to the high street.

## Background to the research

According to the National Office for Statistics, people over fifty (the majority of whom are women), comprise an increasing proportion of our population. Personal and anecdotal evidence shows an imbalance between the sartorial aspirations of middle aged women in the UK and the availability of desirable, well fitting yet affordable clothing. This research addresses these phenomena in the context of knitwear.

Ageing changes body shape; these changes were catalogued by Professor Susan Ashdown during research into older women’s clothing at Cornell University. Ashdown also found that 92% of older women have difficulty finding well-fitting clothes (Lang). The 2003 national survey SizeUK found the average woman to be a size 16, and in 2004 Size USA showed a similar trend (Sorkin; TC2). Paradoxically, and in parallel with middle aged women, women of size 16 and above find clothes shopping fruitless, and frustrating (Shabi).

One significant finding of this research is that larger and or older women’s response to this is to look to custom made clothing. 8% of survey respondents already buy or make custom made clothing and 84% would consider doing so in the future. Surprisingly commercial customised clothing remains comparatively unexplored; custom jeans being the main area. An opportunity remains to provide domestic bespoke knitwear, as pioneered by Wajima Kohsan Ltd with their Factory Boutique Shima in Japan. At the Global Challenges knitting conference in 2005, Alison Imrie, of the European Commission’s Directorate General Enterprise for Textiles, described the EU development strategy of supporting small to medium sized enterprises. Significantly, the average UK company has 20 or less employees, placing them directly within this category. She also spoke of “mass production to customisation”, a premise of the 2005 European Technical Platform for the Future of Textiles and Clothing. Bespoke knitwear would rely heavily on information technology and fast response, two development areas recommended for funding by the European commission.

### **“Just because I’m fat doesn’t mean I have arms like a gorilla!”**

“Clothing for my size (and age) is either extremely expensive or non-existent”, so wrote a sixty year old, size 16 survey respondent. Another woman who is a size 22 commented, “Availability of clothes for larger people seems out of step with the % of the population who are large.” From these comments, it appears that off-the-peg clothing fails to meet the needs of plumper and or older women. These women express the commonly found incidence of relationally disproportionate body dimensions. In this research it has been empirically evidenced that arm length is not affected by plumpness, neither is the breadth of the shoulders increased proportionally with other torso girths.

### **“Fashion requires thinness”**

It has been substantiated that social and cultural prejudice operates against obese individuals. In Puhl’s study on Bias, Discrimination, and Obesity, 28% of teachers considered that becoming obese was the worst thing that could happen to a person and 24% of nurses said that they were “repulsed” by obese persons. Considering this response, it is not surprising that the image-conscious fashion world harbours an abhorrence of fat. Shulman writes, “Alexander McQueen once commented that the two things the fashion folk were most frightened of were fat and [clothes] moths”, in personal corroboration she continues, “Ever one to plumb our collective fears, his spring/summer 2001 show’s finale featured a naked model with moths dotted all over her”. This was an allusion to fetish writer Michelle Olley, whose voluptuousness made a stark contrast to the excessively thin catwalk models. Parodying Joel Peter Witkin’s photograph ‘Sanitarium’, McQueen placed a breathing tube in Olley’s mouth and a pig mask on her bandaged face, thereby associating ill health, ugliness and destruction with plumpness. An interviewee in Millman’s 1980s book ‘Such a pretty face’, says, “In terms of discrimination, the best equivalent of being very fat is being a homosexual.” Twenty six years later, contemporary Western society tolerates sexual choice; but if anything it has become more judgemental of appearance. In 2003, Evans observed, “Although the fashion world may embrace polymorphous perversity when it comes to sex, it is narrowly prescriptive about body shape and size. Above all it does not tolerate fat, which with some honourable exceptions, is taboo”.

To dismiss a potential share of the £23 billion a year that UK consumers spend on clothing seems to be letting prejudice cloud commercial sense.

### **“Changing rooms are vortexes of depression”**

A respondent to this research’s online survey, observed, “As a child, having to shop for ‘special’ sizes was very painful, and made me feel different and flawed.” This is one example of the psychological pitfalls large women encounter when trying to buy clothing that fits. When researching young, middle class women’s shopping behaviour, Abbott and Sapsford found that trying clothes on in a group situation was more important than buying them. Given that plumper women could find this embarrassing when their bodies are viewed next to their ‘normal’ peers, there is added poignancy in Abbott’s next observation; that those over size 14 “find it difficult if not impossible to purchase the clothing that is seen as fashionable, and are thus also [as poorer girls] excluded from teenage fashion”. Overall when clothes shopping, large women have a compromised

consumer experience with limited choice and the potential for humiliation. Considering Entwistle's observation, "clothing adds meaning and aesthetic value to bodies and cements them temporarily in space and place", in the context of Abbott's findings, the obverse can be deduced; that when denied access to clothing that acts as these indicators, larger young women become excluded from their peer group and the majority of older women find themselves disregarded by fashion.

## **Aims and objectives**

To date there is no evidence that flat-bed knitting is being explored elsewhere for this specific purpose, and one aim is to make an accessible contribution to the knowledge pool of shaped knitwear. This research is prototyping garments and templates of customised knitwear for larger women, to enable their potential production based on the EU's strategies on textiles and clothing.

Outcomes of this research could partially bridge the gap between design and production, described by Eckert as the cognitive styles of designer and technician and by the 2004 European Commission as, "traditional professional boundaries". Computer aided design with manufacture is integral to the project, allowing flexible design for individual variables and utilising interdisciplinary skills on converging pathways, which represents this research's innovative uniqueness in knitting.

## **Methods**

A pilot study has culminated in a capsule collection of prototype garments and contributed to the design and inception of a main study for which a small group of middle aged woman over size 16 has been recruited.

### **Designing a body measuring system specific to larger sizes**

Initially Heath Carter's Somatotype body types were considered, but simpler categories specific to plumper women were needed, for which American 'plus size' pattern developers Deckert, Cooklin, and Betzina were consulted. Categories were defined for frontal plane silhouette and fat deposition and sagittal (side view) plane posture, then a unique system of relational landmarks was developed. Constant points were established on the participant and used to measure relationships to variable body girth positions.

Measurements between these pre-established landmarks establish the body's proportions. A 'clone', photographs and video support knit prototyping.

Measuring has to date been by traditional methods, enabling the construction of identical 'clones' of the participant's torso which facilitates continual evaluation. Although body scanning was considered and is still a possibility, lack of local facilities plus a knowledge gap over transferring body scan data to the SDS1 programmer render it currently impractical. The need for a physical representation on which to test samples favoured a hands-on method, whilst measuring sessions created opportunities for informal interviews and familiarisation with each participant's body shape.

## **Designing a contextual topographic and evaluation system**

Knitting is extensible; therefore it is important to be able to measure its behaviour on a 3D surface. Watkins in, 'Clothing, the Portable Environment' writes about Kirk and Ibrahim's 'anthropometric kinematics' investigation into localised skin strain. She also discusses using stretch clothing with surface grids, and Ashdown's experiments with slit, non-stretch clothing. Adopting these precedents, a two centimetre grid has been permanently configured on each garment so that extension and relaxation of stitches can be monitored within the structure. Because the grid is embedded into the knitting, and knitting stitches are interrelated, routes to the source of distortion can be mapped, making it an accurate and rigorous stretch-evaluation tool.

## **Knitting prototypes and creating templates**

Consistency of fabric was established using easy care yarn, a stitch density control and a simple purl structure. This is supple, less complex to programme than intarsia and simpler to 'read' than double bed jacquard. Reverse loops form permanent surface-pattern-to-stitch ratios which highlight extension (Spencer), ecru yarn maintains stitch clarity and fine elastane stabilises the grid (Smirfitt), reducing misreading. Narrowing, increasing, progressive wale transfer and flèche give 3D shape to the garments. Templates in an internationally recognisable format, created by combining individual body measurement data with the topographical grid, have been stored electronically for use in the main study.

## **Evaluation - spatial awareness, addressing shape**

It has been observed that participants need to look in a mirror, pull at the fabric and touch their body in order to satisfy their curiosity about fit. To get useable, valid results the participant has had to be questioned in a semi-structured way, focussing on fit and feel rather than aesthetics. This provides a subjective, inside-out view of fit and comfort, whilst objective evaluation of the external effects can be made from subsequent viewing of the videoed sessions.

In flat pattern fitting, wrinkle analysis is a long-established practise (Watkins). Folds caused by protruding areas are hidden in darts and pleats, creating a 3D shape to accommodate the protuberance; however this excess fabric remains, and if cut off creates an internal seam which may cause discomfort. Following similar principles, but integrating darts within the structure, a smooth 3D shape can be knitted. Equally where girth varies longitudinally, for example from full buttocks to a narrow upper back, an inverse vertical dart can be integrated.

## **Findings so far**

Methods, methodology and ethical considerations from the pilot study have been reviewed and adapted for the main study, whilst the online survey has yielded fruitful anecdotal and statistical results. The pilot study data has been interpreted into 3D knitted shapes; respecting yet continually questioning rules and accepted practises of knitting and clothing construction. Templates have been stored for future developments.

Garments knitted so far visibly demonstrate refined relationships to an individual body shape. As hypothesized, the space between body and knitting can be directly influenced by referring stitches from other areas.

## Where to from here?

Once the research is completed, the template library will have international value. As knitting principles are common, and a universal colour coded language is used, it may contribute to the development of a successful dialogue between knitwear designer and technician for bespoke production.

In order to communicate findings, contextual definition of 'fit', 'ease' and other descriptors of clothing to body relationships is necessary. Their subsequent controlled application to specific areas of a garment, in direct response to individual 3D body shape represents the ongoing practical content of the research.

Future theoretical work will place industrially manufactured knitwear for larger women in a contemporary and historical context. The absence of many contemporary texts on industrial knitting means that this work will be original and could possibly form the basis for post doctoral research.

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