

## Period Foundation Garments and the Changing Standard Form: Using 3D Body Scanning and Standardized Size Charts to Examine the Malleability of the Female Figure

Charity Calvin Armstead, Brenau University

### Significance/Innovation of Concept

Foundation garments have long been used to transform women's bodies into the fashionable ideal of a period (Burns-Ardolino, 2007). Although diet and exercise have replaced stays and corsets in as the primary means of controlling the female form (Steele, 2003), female bodies continue to be transformed by bras and other shaping garments. Existing literature on 3D body scanning does not address the impact of period shapewear on the female form. Additionally, changes in women's measurements and proportions are difficult to evaluate due to inconsistencies in sampling and data collection (Christel & Dunn, 2017). This study explores some of the effects of shapewear; specifically, historic foundation garments, which have not been discussed in the literature on body scanning, and the relationship of these foundation garments to body proportion. This was an exploratory study to evaluate the transformation of a female body with different types of historical foundation garments.

### Body Scanning

*Methods.* One female body (the researcher) was scanned in a variety of period shapewear, using a Vitus XXL 3D body scanner. Garments included: (a) reproduction mid-eighteenth-century stays, (b) reproduction Regency stays, (c) a reproduction 1880s corset, (d) a reproduction 1950s merry widow, (e) an extant 1950s long-line bra, (f) an extant 1950s-60s girdle, and (g) a 2018 Le Mystere Dream Tisha bra, size 32C (the researcher's everyday bra). Measurements generated during the scan were tabulated, and the scans were visually compared.

*Results.* In her everyday bra and panties, the researcher measures 39.9" at the full bust with a 30.8" waist; wearing historic undergarments, her bust measurement varied up to 7 inches and the waist varied up to 4.3", depending on the type of undergarments used. Visual comparison of the scans revealed differences in the form of the bust, waist, and hips, including the position and form of the breasts, the overall shape of the torso, and the curves of the hips/buttocks.

### Comparison of Period Size Charts

*Methods.* For the second part of this study, size charts gathered from extant sewing patterns, governmental sizing standards, and sewing publications, early 1900s to present, were compared to determine what, if any, chronological changes exist in women's expected proportions. Examining differences in the bust-waist-hip ratios of historical sizing standards offers insight into changing industry expectations of body proportions.

*Results.* Comparing the measurements from the early 1900s to current sizing documents, waist circumference has increased relative to bust circumference over time. Changes are

compatible with the measurement ratios from the body scans, indicating that some of the increases in women's waist measurements may be attributable to the decreased use of shapewear.

### Proposal for Future Action

Although this study was designed to examine the effects of historic shapewear on an individual's silhouette, the findings have implications for current practices related to anthropometric research and body scanning methodology. First, some differences in women's sizes between studies may be explained by differences in the undergarments used, complicating the longitudinal comparison of women's measurements across various decades. Future studies comparing measurements should consider differences that may have been introduced by period shapewear, and further research should be conducted to clarify the effects of shapewear from different periods on a larger sample. Second, body scans generate a rigid avatar that does not replicate the malleability of the human body; therefore, the body must be scanned in the correct undergarments for a given application prior to checking fit. A study designed for testing garment fit should use the undergarments that the participants would wear with the type of garment being designed. Third, participation in body scanning has been shown to contribute to negative body cathexis (Grogan, Gill, Brownbridge, Warnock, & Armitage, 2016; Ridgway, 2018). Because differences in undergarments impact the body's appearance and measurements, women accustomed to seeing their bodies shaped by their own garments may be unpleasantly surprised when viewing a scan conducted in different undergarments; discrepancies that may be introduced by differences in shapewear should be taken into consideration in evaluating women's reactions to their 3D scans.

The discrepancy between naked bodies and bodies in shapewear, combined with the lack of flexibility in recorded measurements and in body scanning avatars, indicates that (1) for the purposes of comparing measurements over time, changes in undergarments should be accounted for; and (2) that in body scanning for the purpose of developing clothing, women should be scanned in the undergarments that they would wear with the garment(s) being designed.

### References

- Burns-Ardolino, W. (2007). *Jiggle: (Re)shaping American women*. Lanham, MD: Rowman & Littlefield.
- Grogan, S., Gill, S., Brownbridge, K., Warnock, D., & Armitage, C. J. (2016). Women's long-term reactions to whole-body scanning: A mixed methods approach. *Clothing and Textiles Research Journal*, 34(1), 61–73. <https://doi.org/10.1177/0887302X15603117>
- LaBat, K. L., & DeLong, M. R. (1990). Body cathexis and satisfaction with fit of apparel. *Clothing and Textiles Research Journal*, 8(2), 43–48. <https://doi.org/10.1177/0887302X9000800206>
- Ridgway, J. L. (2018). Before and after avatar exposure: The impact of body scanning technology on body satisfaction, mood, and appearance management. *Clothing and Textiles Research Journal*, 36(2), 91–103. <https://doi.org/10.1177/0887302X17749924>
- Steele, V. (2003). *The corset: A cultural history*. New Haven: Yale University Press.