

**A Comparative Study of Pattern Engineering
for the Current Size and Shape of Australian Women**

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Master of Medical Sciences

In Anatomical Sciences

(The University of Adelaide)

This thesis was undertaken within the Department of Anatomy and Pathology at
The University of Adelaide in fulfilment of the requirements of
PhD in Medicine / PhD in Medicine Human Biology

Supervisor

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Candidate's Declaration

Thesis Title: **A Comparative Study of Pattern Engineering
for the Current Size and Shape of Australian Women**

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The careful observer of the many types of female figure will not be long in reaching the conclusion that very few of them conform to the generally accepted artistic and sartorial ideals. There may be aspects of the latter to be found in quite a large number of figures but rarely is there found a perfect combination. The Venus of the poet, the painter and the sculptor is a very elusive lady

*Assessing Female Figure Proportions (p 212)
Hard's Year Book for the Clothing Industry (1954)*

ABSTRACT

This thesis examines and analyses from an anatomical and anthropometric perspective, two pattern engineering systems currently used by the clothing industry for the production of female garments. To the best of the researcher's knowledge no similar study has been previously conducted in Australia. The research is significant in that pattern engineering systems provide the basis from which all garments are produced.

Biological changes in human female morphology over the past century have impacted significantly on the clothing industry's ability to provide garments that meet an acceptable fit standard. Rising concerns regarding the increase in overweight and obesity provide an even greater challenge for the production of well fitting female garments.

Many pattern engineering systems rely on a long standing assumption of proportionality based on a fixed relationship between specific body dimensions, such as height and breadth, to calculate other body dimensions. These systems overlook relative changes in body dimensions that have occurred and are continuing to occur at the present time. In contrast, the use of direct measurements requires no assumptions regarding body shape and accommodates all body types with equal proficiency.

This study compared two such systems, testing the fit of dress toiles made in compliance with the specifications of both types of systems, and fitted on a group of adult females, each of whom conformed to one of 5 body types anthropometrically identified in the Australian population by the author in earlier research. The dress toiles constructed according to direct measurement principles were significantly superior in fit to those constructed according to calculated proportional principles. They were also the preferred choice of 100% of subjects when rated for comfort and ease of movement.

The following conclusions were made: (i) that the assumptions concerning body size and proportions underlying calculated proportional pattern drafting systems are questionable, particularly in view of the accelerating secular trend of obesity, and (ii) that direct measurement pattern cutting systems which focus on and use current body shape data are better able to accommodate unpredictable and unspecified variations in the size and shape of the human female body. The lack of standardisation of body measurement techniques was discussed with particular emphasis on the bust circumference which is fundamental in calculated proportional systems. Note was also made of the divergence away from technical skills and expertise in anthropometry which may be a result of the restricted curriculum currently offered by training institutions in Australia and elsewhere.

There was strong agreement between the results and conclusions of this study with recent industry initiatives, which are pressing for an anthropometric survey of the population in order to obtain data for new practical clothing size standards. In this regard it was proposed that body shape categories should be considered in clothing size [shape] standards, as a focus on body shape may provide a more workable approach for classification of the relationship between key components of female morphology.

Acknowledgements

I wish to thank my principal supervisor, Professor Maciej Henneberg, and co-supervisor, Doctor Renata Henneberg, for their confidence, encouragement, support, patience, and guidance throughout my academic journey. This study has enabled me to fulfil a dream associated with my lifelong passion of the study of the human female body from the perspective of pattern engineering with the aim to achieve aesthetically pleasing garments for a variety of anatomically different figure types. The outcomes I have achieved are more than I had ever anticipated. For this I am eternally grateful.

I would like to dedicate this thesis to my beautiful grandchildren, Tom, Ben, Bella, Tayla, Lily and Gracie. I hope that each of you will also achieve your dreams throughout your life.

To my husband Ken for his most welcome vocabulary skills, son David for just being there [you were lucky to escape the tape measure], and daughters Suzanne and Carolyn in particular for their willingness [under a little coercion!!!] to participate in the endless round of measuring, and *toile* testing, over the past several decades. This contributed enormously to me realising my dreams. I sincerely thank you all.

To Jane Dowling who was brave and patient enough to help me get started on the computer initially, as well as assisting me in the more complex areas of computer applications. Without her untiring help, regardless of the time of day [or night] I could never have achieved these outcomes.

I wish to acknowledge and thank Lois Hennes for her mentoring and guidance in relation to the Metric S. I. Method, [Systeme Internationale]. Her knowledge and expertise in this area were invaluable.

I would like to thank Catherine Newman for her editing and proof reading, as well as sharing her skills in academic writing.

To my colleagues and students past and present: I dedicate this thesis to you all. I admire you for your dedication in a very challenging field that in many respects does not get the recognition that it deserves.

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