Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.
Draped Garments:
The influences of fabric characteristics and draping methods on 3D form

A thesis presented in partial fulfillment of the requirements for the degree of
Master of Design

at Massey University, Wellington, New Zealand

Ying Li

2006
Acknowledgements

This one year’s research towards my Masters of Design was a challenging and fruitful process. I would like to thank the people who have helped me a lot over the past year.

Thanks to my wonderful supervisors Janet Webster and Arti Sandhu for their inspiration, guidance, patience, and time. I could not have made this project without them. I appreciate the support of technicians Tina Humphries and Carol Stevenson. A big thanks to my parents for their great love and support. I cannot thank them enough and will be forever grateful. Thanks to my boyfriend, Enning Tang, for his warmth, encouragement and unwavering help. Thanks to Gretchen Ivess, Hannah Davis, Michael Melville, Rehana Mohideen and Ying Wang for all their help.
Abstract

This thesis explores the way in which fabric characteristics; in particular the drapeability can influence and create three-dimensional form for garments. The aim is to combine scientific, visual and drape research and design methodologies to better inform the final design outcome – in this case a collection of garments. The characteristics of a fabric influence the draping effect. How fabrics with different drapeabilities influence design ideas and final forms is explored and revealed in this thesis.

An experimental fabric drape testing method is developed, which is suitable for the design processes of a practicing designer in order to investigate fabrics’ drape characteristics. Six fabrics are chosen from the experiments that establish the quantitative and visual evidences for the design development. Each fabric is draped into one form according to its characteristic that influences the design ideas. Then other fabrics are draped into the same form to provide comparisons of their different performances and
evaluate how they create different appearances for the same form. A range of three-dimensional effects that are different from conventional garment shapes are created in which the fabric controls the final form. Various draping methods inspired by selected contemporary designers are employed to design the spatial effects around the body. Concepts of deconstruction, imperfection, volume, voids and architectural shape, are addressed in the design methodology.

The collection “Changing Dresses” is the final outcome of the initial design research, in which six dresses are created with variations from a single basic form. A range of draping methods are employed that best highlight the qualities of the fabrics and create sculptural forms that reflect the knowledge of fabrics on the body gained through the research. The three-dimensional garments, thus, stem from the research into the relationships among fabric characteristics and draping methods.
# List of figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4</td>
<td>Five basic draping forms. Author's own (2004)</td>
<td>3</td>
</tr>
</tbody>
</table>


2.6 The diagram of relationship between drape, fabric and 3D form. Author’s own (2005)


The test apparatus for measuring drape coefficient in the experiment. Author’s own (2005)
3.2 The diagram of the fabric test apparatus. Author’s own (2005) 43
3.3 The digital image after the calibration. Author’s own (2005) 45
4.1a Front view of fabric B jacket. Author’s own (2005) 62
4.1b Back view of fabric B jacket. Author’s own (2005) 63
4.2a Front view of fabric A jacket. Author’s own (2005) 64
4.2b Back view of fabric A jacket. Author’s own (2005) 64
4.3a Front view of fabric C jacket. Author’s own (2005) 65
4.3b Back view of fabric C jacket. Author’s own (2005) 65
4.4a Front view of fabric D jacket on the widthwise grain. Author’s own (2005) 66
4.4b Right side view of fabric D jacket on the widthwise grain. Author’s own (2005) 66
4.4c Back view of fabric D jacket on the widthwise grain. Author’s own (2005) 66
4.4d Front view of fabric D jacket on the lengthwise grain. Author’s own (2005) 66
4.4e Left side view of fabric D jacket on the lengthwise grain. Author’s own (2005) 66
4.4f Back view of fabric D jacket on the lengthwise grain. Author’s own (2005) 66
4.5a Front view of fabric E jacket. Author’s own (2005) 67
4.5b Back view of fabric E jacket. Author’s own (2005) 67
4.5c Left side view of fabric E jacket. Author’s own (2005) 67
4.6a Left side view of fabric A cutout dress in the first layout structure. Author’s own (2005) 68
4.6b Left side view of fabric A cutout dress in the second layout structure. Author’s own (2005) 68
4.6c  Front view of fabric A cutout dress in the first layout structure. Author’s own (2005)  
4.6d  Front view of fabric A cutout dress in the second layout structure. Author’s own (2005)  
4.6e  Right side view of fabric A cutout dress in the first layout structure. Author’s own (2005)  
4.6f  Right side view of fabric A cutout dress in the second layout structure. Author’s own (2005)  
4.7  Front view of fabric B cutout dress. Author’s own (2005)  
4.8  Front view of fabric C cutout dress. Author’s own (2005)  
4.10  Front view of fabric F cutout dress. Author’s own (2005)  
4.11  Front view of fabric A cutout dress in the alternative method. Author’s own (2005)  
4.12  Front view of fabric B cutout dress in the alternative method. Author’s own (2005)  
4.13  Front view of fabric C cutout dress in the alternative method. Author’s own (2005)  
4.15  Front view of fabric F cutout dress in the alternative method. Author’s own (2005)  
4.16a  Back view of fabric D blurred dress. Author’s own (2005)  
4.16b  Left side view of fabric D blurred dress Author’s own (2005)  
4.16c  Front view of fabric D blurred dress. Author’s own (2005)  
4.16d  Right side view of fabric D blurred dress. Author’s own (2005)  
4.16e  Back open structure of the skirt section of fabric D blurred dress. Author’s own (2005)
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Author</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.17a</td>
<td>Front view of fabric A blurred dress. Author’s own (2005)</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>4.17b</td>
<td>Back view of fabric A blurred dress. Author’s own (2005)</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>4.18a</td>
<td>Front view of fabric C blurred dress. Author’s own (2005)</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>4.18b</td>
<td>Back view of fabric C blurred dress. Author’s own (2005)</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>4.19a</td>
<td>Front view of fabric E blurred dress. Author’s own (2005)</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>4.19c</td>
<td>Back open structure of the skirt section of fabric E blurred dress. Author’s own (2005)</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>4.20a</td>
<td>Front view of fabric F blurred dress. Author’s own (2005)</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>4.20b</td>
<td>Back view of fabric F blurred dress. Author’s own (2005)</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>4.21a</td>
<td>Front view of fabric E one-piece top. Author’s own (2005)</td>
<td></td>
<td>83</td>
</tr>
<tr>
<td>4.21b</td>
<td>Back view of fabric E one-piece top. Author’s own (2005)</td>
<td></td>
<td>83</td>
</tr>
<tr>
<td>4.21c</td>
<td>Right side view of fabric E one-piece top. Author’s own (2005)</td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>4.22a</td>
<td>Front view of fabric A one-piece top. Author’s own (2005)</td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>4.22b</td>
<td>Back view of fabric A one-piece top. Author’s own (2005)</td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>4.23</td>
<td>Front view of fabric B one-piece top. Author’s own (2005)</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>4.24a</td>
<td>Front view of fabric C one-piece top. Author’s own (2005)</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>4.24b</td>
<td>Right side view of fabric C one-piece top. Author’s own (2005)</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>4.25a</td>
<td>Front view of fabric D one-piece top. Author’s own (2005)</td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>4.25b</td>
<td>Side view of fabric D one-piece top. Author’s own (2005)</td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>Page</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.26</td>
<td>Front view of fabric F one-piece top. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.27a</td>
<td>Front view of fabric F geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.27b</td>
<td>Detail of the sleeve of fabric F geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.27c</td>
<td>Right side view of fabric F geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.27d</td>
<td>Left side view of fabric F geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.28</td>
<td>Back view of fabric A geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.29a</td>
<td>Back view of fabric C geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.29b</td>
<td>Right side view of fabric C geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.30a</td>
<td>Right side view of fabric F geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.30b</td>
<td>Back view of fabric F geometric dress. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1a</td>
<td>Front view of the basic form. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1b</td>
<td>Right side view of the basic form. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1c</td>
<td>Detail of how the hands insert into the pockets. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1d</td>
<td>Left side view of the basic form. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1e</td>
<td>Back view of the basic form. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2a</td>
<td>Front view of dress A. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2b</td>
<td>Right side view of dress A. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2c</td>
<td>Back view of dress A. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2d</td>
<td>Left side view of dress A. Author’s own (2005)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.2e  Detail of the sleeve of dress A. Author’s own (2005) 102
5.3a  Front view of dress B. Author’s own (2005) 103
5.3b  Right side view of dress B. Author’s own (2005) 103
5.3c  Back view of dress B. Author’s own (2005) 103
5.3d  Left side view of dress B. Author’s own (2005) 103
5.4a  Front view of dress C. Author’s own (2005) 105
5.4b  Right side view of dress C. Author’s own (2005) 105
5.4c  Back view of dress C. Author’s own (2005) 105
5.4d  Left side view of dress C. Author’s own (2005) 105
5.5a  Front view of dress D. Author’s own (2005) 107
5.5b  Right side view of dress D. Author’s own (2005) 107
5.5c  Back view of dress D. Author’s own (2005) 107
5.5d  Left side view of dress D. Author’s own (2005) 107
5.5e  Detail of the back view of dress D. Author’s own (2005) 108
5.6a  Front view of dress E. Author’s own (2005) 109
5.6b  Right side view of dress E. Author’s own (2005) 109
5.6c  Back view of dress E. Author’s own (2005) 109
5.6d  Left side view of dress E. Author’s own (2005) 109
5.7a  Front view of dress F. Author’s own (2005) 110
5.7b  Right side view of dress F. Author’s own (2005) 110
5.7c  Back view of dress F. Author’s own (2005) 110
5.7d  Left side view of dress F. Author’s own (2005) 110
5.7e  Detail of the front view of dress F. Author’s own (2005) 111
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Physical characteristics of the six selected fabrics</td>
<td>48</td>
</tr>
<tr>
<td>3.2</td>
<td>Visual and aesthetic characteristics of the six selected fabrics</td>
<td>53</td>
</tr>
<tr>
<td>4.1</td>
<td>Visual table of design development</td>
<td>92</td>
</tr>
<tr>
<td>5.1</td>
<td>Visual table of the final dresses</td>
<td>113</td>
</tr>
<tr>
<td>A1</td>
<td>The comparison of Drape Coefficients of the two methods</td>
<td>124</td>
</tr>
<tr>
<td>A2</td>
<td>Physical characteristics of the 21 fabrics</td>
<td>125</td>
</tr>
</tbody>
</table>
Table of contents

Acknowledgements i
Abstract ii
List of figures iv
List of tables xiii
Table of contents xiv

Chapter one: introduction 1
1.1 Central proposition 1
1.2 Background 2
1.3 Research aims and objectives 4
1.4 Methodology 6
1.5 Overview of thesis 7
Chapter two: literature review

2.1 Fabric influence on draping
   2.1.1 Approaches of drape assessment
   2.1.2 The Gioello method and the Aldrich method
   2.1.3 Fabric characteristics influencing drape
   2.1.4 Bias cut
   2.1.5 Summary

2.2 Draping methods influence on the effect of garment

2.3 Contemporary designers' works exploring the unconventional draping and fabric usage

2.4 Three-dimensional forms in contemporary designers' works: deconstruction, imperfection, void, volume and architectural shape
   2.4.1 Deconstruction
   2.4.2 Imperfection
   2.4.3 Volume/void
   2.4.4 Architectural shape

2.5 Summary

Chapter three: fabric investigation

3.1 Fabric sourcing

3.2 Fabric testing experiment
3.2.1 Definitions of fabric drape and Drape Coefficient
3.2.2 Apparatus and method
3.2.3 Checking the accuracy of the modified digital method

3.3 Results

3.3.1 Physical characteristics of the 21 fabrics
3.3.2 Selection of final six fabrics
3.3.3 Discussion of the selected fabrics
3.3.4 Simple visual tests of six fabrics

Chapter four: design development

4.1 Introduction
4.2 Design development

4.2.1 Deconstruction: the jacket
4.2.2 Imperfection: the cutout dress
4.2.3 Volume and void: the blurred dress
4.2.4 Gathering voids: the one-piece top
4.2.5 Architectural shape

4.3 Discussion and summary
Chapter five: final collection - “Changing Dresses” 97

5.1 Basic design 98

5.2 Six dresses 100

5.2.1 Dress A – fabric A
5.2.2 Dress B – fabric B
5.2.3 Dress C – fabric C
5.2.4 Dress D – fabric D
5.2.5 Dress E – fabric E
5.2.6 Dress F – fabric F

5.3 Discussion and summary 112

Chapter six: conclusion 116

Appendix 1 The comparison of Drape Coefficients of the two methods 124
Appendix 2 Physical characteristics of the 21 fabrics 125
Appendix 3 Photographs of design development 129
Appendix 4 Photographs of final collection 144

References 152
Bibliography 155