

**Department of Architecture and Interior Architecture
School of Built Environment
Faculty of Humanities**

**Making Custodians:
A design anthropology approach to
designing emotionally enduring
built environment artefacts**

Penelope Forlano

**This thesis is presented for the degree of
Doctorate of Philosophy
of
Curtin University**

January 2018

DECLARATION

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made. This thesis contains no material which has been accepted for the award of any other degree or diploma in any university

Human Ethics (For projects involving human participants/tissue, etc). The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number HREC 5297/ RDHU-54-15, and 10678.



Penelope Forlano

January 2018

ABSTRACT

My doctoral research through creative production takes a Design Anthropology approach to examine the person-object relationship typical of artefacts with long-term or intergenerational attachment and special significance. I then speculate on the implications of these findings with the goal of designing enduring new built environment artefacts, surfaces, and furniture. The exegesis explores the context of this enquiry within design theory and practice and its significance, given the environmental impact of high levels of premature disposal and 'fast' consumption.

I synthesise consumer behaviour and anthropological studies on enduring person-object relationships and incorporate findings from my own interviews and survey study. This underpins my speculation on how an enduring person-object relationship can be encouraged through the design of 'enduring artefacts' within an Enduring Design framework and through practice exemplars.

I examine notions of the emotionally enduring by adopting a design anthropology perspective of the person-object relationship and object attachment theory and discuss this in the context of design discourse and design practice. Through this research I propose two new rituals; 'custodial priming' and 'curatorial reframing', not previously conceptualised as part of the reappropriation of goods. Design discourse focuses only on reappropriation in terms of instrumental function, or physical form as seen in the rituals of divestment and transformation. It rarely addresses the emotional and psychological process of reappropriation that is revealed through a Design Anthropology perspective.

The exploration of the recovery, priming and reframing rituals, informs the twelve constituent parts of the Enduring Design Framework to encourage (re)appropriation and the emotional and psychological intergenerational transfer of goods for artefact endurance.

The Enduring Design Framework emerges from literature reviews, survey and interview data, and the process and outcomes of creative practice. The creative works explore theoretical notions, test the findings and propose real-life solutions. This research builds upon and expands my existing practice in enduring design that can be reflexively critiqued through the Enduring Design framework.

Through the discussion of the Enduring Design Framework I also discuss contemporary design precedents for each of the twelve components enabling me to contextualise my creative work within the area of enduring design.

Additionally, I contribute to a post-phenomenological approach to design critique by revealing that the prevailing object-analysis approach by design theorists and design practitioners misses a crucial quality of enduring artefacts that I have termed their *evidential function*. Typically, artefact function is discussed in terms of instrumental and product language (semiotic and symbolic visual appearance) and more recently, through the work of Peter-Paul Verbeek, a philosopher of technology, the mediatory role of artefacts. I argue the need for a new category, the *evidential function*, to make known this particular phenomenon of enduring artefacts, thus far not addressed within design discourse.

The creative practice informed, and was informed by, the Enduring Design Framework through an exploration and execution of works from highly bespoke and personal, to large community architectural scaled artefacts and low-cost furniture specifically;

- a. Two, one-off bespoke domestic artefacts
- b. Two lower cost, production-based modular sets of artefacts, and
- c. Three 'public heirlooms' for communities, thereby trialling the applicability and interpretation of Enduring Design through larger scale architectural works with a wider audience.

These creative works contribute to the evolution in my own practice, including developing new skills and approaches, reflexive critique of my creative practice and outcomes, and offering propositions of how a contemporary design practitioner may design for the emotional and psychological endurance of built environment artefacts.

This research contributes to debates on positive consumption, sustainable design, obsolescence, and enduring design for the built environment disciplines. Its significance lies in the issues and design considerations of reducing premature disposal of built environment artefacts and thereby addressing waste and environmental concerns. The process contributes to my new creative practice direction, including the capacity of surface to communicate greater meaning, new ways of understanding an artefact, including its purpose as evidence, and ways to encourage custodianship practices. The combination of practice and theory has resulted in a framework for use by design practitioners and theorists interested in designing emotionally enduring built environment artefacts.

STATEMENT OF CONTRIBUTORS

I am the sole practitioner of Forlano Design with no employees or regular contractors, unless otherwise stated below.

The fabrication of *Endless Quilt* and *For Now, For All-ways* were entirely completed by myself, using engraving and printing machines at Curtin University and a commercial printer respectively. The metal legs and timber carcass of *The Unforgotten* were outsourced, while I completed the complex facets. I met with the machinists several times during the making and testing process to ensure the correct outcome.

Composite Components are manufacturers of advanced composite constructions. I am a financial partner alongside Glen Oldfield. Public art projects *From the Skies* and *Kaleidoscopic Wave* were tendered for, designed, documented and project managed by Forlano Design, while Composite Components (CC) was the partnering fabricator. Composite Components provided invaluable cost estimates and later prepared shop drawings for *Kaleidoscopic Wave* and partial shop drawings for *From the Skies*. Composite Components did not contribute to the *Marri-Kingia Memories* projects nor provide any design contribution to any works.

Scott and Associates provided structural advice for all three public art projects. Loren Adams and Andrei Smolik provided some algorithmic programming via the *Rhinoceros* add-on *Grasshopper*, under direction.

I provided all design and shop drawings for CAD/CAM fabrication, which was carried out by designated sub-contractors and machinists for *En-case*, *Marri-Kingia Memories* and *From the Skies*.

TABLE OF CONTENTS

- Declaration iii
- Abstract.....v
- Statement of Contributorsvii
- Table of Contents viii
- List of Figures xi
- List of Tables.....xix
- List of Abbreviationsxxi
- Acknowledgements..... xxiii
- Dedicationxxv

- Chapter 1 Introduction 1
 - 1.1 Gendered practice..... 7
 - 1.2 Research scope..... 8
 - 1.3 Research gap and significance 9
 - 1.4 Aims and objectives14
 - 1.5 Document map15

- Chapter 2 The design perspective.....17
 - 2.1 The historical context of enduring design17
 - 2.2 Contemporary enduring design approaches20
 - 2.3 An alternative approach22

- Chapter 3 Methodology24
 - 3.1 Theoretical perspective24
 - 3.2 Research methodology and methods.....26
 - 3.2.1 Literature Review26
 - 3.2.2 Interviews with stakeholders.....28
 - 3.2.3 Survey.....30
 - 3.2.4 Interviews32
 - 3.2.5 Propositional domestic artefacts33
 - 3.2.6 Commissioned community artefacts.....34
 - 3.2.7 External expert critiques34
 - 3.2.8 Precedent reviews35
 - 3.2.9 Synthesis35

- Chapter 4 The non-design perspective: revealing gaps in practice36
 - 4.1 Fast consumption vs custodianship37

4.2	Maslow, artefacts, and enduring needs.....	45
4.3	The need for evidential qualities.....	52
Chapter 5	Emergence of an enduring design framework.....	56
5.1	Actors and processes that extend artefact life.....	57
5.1.1	Bestowers and curators.....	59
5.2	An overview of enduring artefact characteristics.....	63
5.3	Unpacking enduring person-object relationships.....	66
5.4	The Enduring Design Framework.....	68
5.5	Design for bodily accordance.....	69
5.5.1	Surface and form.....	70
5.5.2	Motion.....	73
5.6	Design for empathic visual relations.....	74
5.7	Design for kinship and self-relatedness.....	75
5.8	Design for community connectedness.....	77
5.9	Design for framed provenance.....	79
5.10	Design for narrative.....	83
5.11	Design for user interaction.....	85
5.11.1	Design for performative interaction.....	86
5.11.2	Evolving interaction through use.....	87
5.11.3	Interaction through making.....	90
5.11.4	Evolving aesthetic transformation.....	91
5.11.5	Co-design to enable creativity or skill.....	92
5.12	Design for self-actualisation.....	94
5.13	Design for enchantment.....	97
5.14	Design for liveliness.....	100
5.14.1	Visual anthropomorphism.....	100
5.14.2	Relational anthropomorphism.....	101
5.15	Design for aging.....	104
5.15.1	Material aging.....	104
5.15.2	Symbolic aging.....	106
5.16	Design for evolving physical transformation.....	107
5.17	Reflections on the enduring design framework.....	111
Chapter 6	Enduring artefacts through creative practice.....	118
6.1	Domestic artefact: <i>Endless Quilt</i>	121
6.2	Domestic artefact: <i>The Unforgotten</i>	132
6.3	Suite of Community Artefacts.....	138
6.3.1	<i>From the skies</i> , Perth Airport.....	138
6.3.2	<i>Kaleidoscopic wave</i> , Fremantle College.....	143
6.3.3	<i>Marri-Kingia Past</i> , Byford Secondary College.....	149

6.4	Domestic artefact 3 & 4: <i>En-case</i> and <i>For Now, For All-ways</i>	158
6.5	Reflexivity and reflection on creative practice	190
Chapter 7	Findings and contributions.....	199
7.1	Theoretical contribution.....	199
7.2	Creative practice contribution	203
7.3	Future research	205
	References.....	206
APPENDICES		227
Appendix A	Data Collection <i>En-case</i> and <i>For Now, For All-ways</i>	228
Appendix B	Custodian interview schedule	232
Appendix C	Survey results Understanding what furniture we throw away, keep and pass on.....	234
Appendix D	Certificates	240
Appendix E	Marketing of furniture as ‘seasonal’	242
Appendix F	Evidence of ‘dis-domesticated’ furniture	244
Appendix G	Expert reviews for <i>Endless Quilt</i> and <i>The Unforgotten</i>	245
Appendix H	Copyright permissions.....	249
Appendix I	Background information on community artefacts.....	252
Appendix J	Background information on <i>For now, For All-ways</i>	276

LIST OF FIGURES

Figure 1-1. Disciplinary-based analytical priorities of existing theory regarding artefact/product design. Forlano, 2017.....	10
Figure 1-2. Significant social experiences and materiality matrix. Forlano, 2017.	11
Figure 1-3. Pie chart comparing tonnage of waste and goods during the production process. Forlano, 2017.....	12
Figure 1-4. Document Map diagram. Forlano, 2017.....	16
Figure 2-1. Updated chart of ‘Strategies for Extending Product-user Relationships’, Forlano, 2017. Adapted from Fuad-Luke (2010, 617).	21
Figure 3-1. Artefact Functions diagram. Forlano, 2017. Adapted from Verbeek (2005, 206).....	25
Figure 3-2. Action Research Process and Methods. Forlano, 2017.....	27
Figure 4-1. Research approach, diagram. Forlano, 2017.	36
Figure 4-2. Artefact Attachment Determinants and Product Function Relationship Map, Forlano, 2017.....	43
Figure 4-3. Maslow's <i>Hierarchy of Needs</i> and Lidwell et al.'s corresponding product design process. Forlano, 2017. Adapted from Lidwell et.al. (2003, 125).	47
Figure 4-4. Maslow's <i>Hierarchy of Needs</i> and Walker's corresponding object categories. Forlano, 2017.....	48
Figure 4-5. Object Typology Chart of Maslow's (expanded) <i>Hierarchy of Needs</i> (1970). Forlano, 2017. Adapted from McLeod (2017, fig. 3).	50
Figure 4-6. Revised object analysis chart, Forlano, 2017. Adapted from Verbeek (2005, 206).....	55
Figure 5-1. The Process, Actors and Rituals of Reappropriation. Forlano, 2017.	60
Figure 5-2. Screenshot of Pamono's webpage for search result 'IKEA', 2016.	62
Figure 5-3 Enduring Design Framework of the Twelve Constituent Parts. Forlano, 2018.....	69
Figure 5-4. Sempe. Inga. <i>Enveloppe Sofa</i> , 2008.....	70
Figure 5-5. Urquiola, Patricia. <i>Smock</i> , 2005.	72
Figure 5-6. Jansen, Trent. <i>Chinaman's Chair</i> , 2004.	73
Figure 5-7. Eames, Charles and Ray Eames. <i>Chaise Lounge</i> , 1956. Forlano, 2017.....	74
Figure 5-8. Koskela and Yolngu weavers. <i>Yuta Badayala</i> lamp shade, 2015.....	78
Figure 5-9. Koskela. <i>Yolngu weaver</i> , n.d.....	78
Figure 5-10. Koskela. <i>Yolngu weavers</i> , n.d.	78
Figure 5-11. Koskela. <i>Koskela staff and Yolngu weaver</i> n.d.	78
Figure 5-12. Amore, Carlotta Modica & Matteo Orland. <i>Variant of Vodo Masko</i> , 2016.....	83
Figure 5-13. Maggiar, Ambrosie. Original (non-customised) design of <i>Vodo Masko</i> table and chair set, 2014.	83
Figure 5-14. n.a. <i>Object 10. Duck Nutcracker</i> , n.d.....	85
Figure 5-15. Koestembaum, Wayne. <i>Object 10. Duck Nutcracker description and commencement of imagined narrative</i> , 2009.	85

Figure 5-16. Rams, Dieter. <i>606 Universal Shelving System</i> , 1960.....	88
Figure 5-17. Rams, Dieter. <i>606 Universal Shelving System</i> , 1960.....	88
Figure 5-18. Rams, Dieter. <i>606 Universal Shelving System</i> , (office context) 1960.....	88
Figure 5-19. Rams, Dieter. <i>606 Universal Shelving System</i> , (kitchen context) 1960.	88
Figure 5-20. Rams, Dieter. <i>606 Universal Shelving System</i> , (residential living room context) 1960.	88
Figure 5-21. Rams, Dieter. <i>606 Universal Shelving System</i> , 1960.....	89
Figure 5-22. Starck, Philippe. <i>Ola Chic</i> (chair and sofa), 2014.....	91
Figure 5-23. Starck, Philippe. <i>Ola Chic</i> (chair with cover), 2014.	92
Figure 5-24. Wegner, Hans. <i>CH24 Wishbone</i> chair, 1950.	96
Figure 5-25. Ponti, Gio. <i>699 Superleggera</i> chair, 1957.	96
Figure 5-26. Verhoeven, Jeroen. <i>Cinderella table</i> , 2005.	100
Figure 5-27. Front Design. <i>Awakening Lamp</i> , 2003.....	101
Figure 5-28. Scarpa, Carlo. <i>Olivetti Building</i> (detail), 1958. Venice, Italy.	101
Figure 5-29. Heijdens, Simon. <i>Broken White</i> , (ceramic bowl), 2004.....	103
Figure 5-30. Heijdens, Simon. <i>Broken White</i> , (bowl detail), 2004.	103
Figure 5-31. Heijdens, Simon. <i>Broken White</i> , (bowl detail), 2004.	103
Figure 5-32. Heijdens, Simon. <i>Broken White</i> , (bowl detail), 2004.	103
Figure 5-33. Eames, Charles and Ray Eames. <i>Lounge Chair</i> , 1956.....	105
Figure 5-34. Netsman, Linda and Jona Netsman. <i>Spoken Leftovers</i> tables, n.d.....	106
Figure 5-35. Netsman, Linda and Jona Netsman. <i>Spoken Leftovers</i> tables (detail), n.d.	106
Figure 5-36. Netsman, Linda and Jona Netsman. Custom designed range of chairs, n.d.	107
Figure 5-37. Hein Eek, Piet. <i>Waste Waste 40 x 40 chair</i> , 2014.	109
Figure 5-38. Gamper, Martino. <i>100 chairs in 100 days project</i> , 2007.....	109
Figure 5-39. Goodrum, Adam. <i>Piano Credenza</i> , 2014.	110
Figure 5-40. Goodrum, Adam. <i>Piano Credenza</i> (detail of top), 2014.	110
Figure 5-41. Goodrum, Adam. <i>Piano Credenza</i> (detail), 2014.....	110
Figure 5-42. Goodrum, Adam. <i>Piano Credenza</i> , 2014.	110
Figure 6-1. Forlano, Penelope. <i>Endless Quilt</i> , 2012. Elevation diagram. Forlano, 2017.	121
Figure 6-2. Forlano, Penelope. <i>Endless Quilt</i> , (overall closed view), 2012. Forlano, 2017.....	121
Figure 6-3. Composite family tree and visual mapping. Forlano, 2012.....	122
Figure 6-4. Hampson, Misses. <i>The Westbury Quilt</i> (detail) c. 1900-1903, (Fabric quilt). Photo by author.	123
Figure 6-5. Hampson, Misses. <i>The Westbury Quilt</i> c. 1900-1903, (Fabric quilt). Photo by author.....	123
Figure 6-6. MacArthur, Elizabeth. <i>Quilt</i> , c1840.	124
Figure 6-7. Unknown creator. <i>Quilt</i> , (detail) c1840.	124
Figure 6-8. Forlano, Penelope. <i>Endless Quilt</i> , (components in open position), 2012.	125
Figure 6-9. Forlano, Penelope. <i>Endless Quilt</i> (five components), 2012.	127
Figure 6-10. Forlano, Penelope. <i>Endless Quilt</i> (eight components), 2012.....	127
Figure 6-11. Forlano, Penelope. <i>Endless Quilt</i> (eight components), 2012.....	127
Figure 6-12. Forlano, Penelope. <i>Endless Quilt</i> (detail of Italian poetry), 2012.....	128

Figure 6-13. Forlano, Penelope. <i>Endless Quilt</i> (engraving details of Madrid streets and nautical flag graphics), 2012.....	128
Figure 6-14. Forlano, Penelope. <i>Endless Quilt</i> (engraving details of lyrics and Alcazar building details), 2012.....	128
Figure 6-15. Forlano, Penelope. <i>Endless Quilt</i> (engraving details of lacework), 2012.....	128
Figure 6-16. Forlano, Penelope. <i>Endless Quilt</i> (engraving details of cranes), 2012.....	129
Figure 6-17. Forlano, Penelope. <i>Endless Quilt</i> (engraving details of “Penelope, the weaver”), 2012.....	129
Figure 6-18. Forlano, Penelope. <i>The Unforgotten</i> , hall console, 2013. Elevation diagram.....	132
Figure 6-19. Forlano, Penelope. <i>The Unforgotten</i> , hall console, 2013.....	132
Figure 6-20. Faerna, Maruja Rodriguez. Handwritten transcribed poetry (portion). c1949 (scanned image 2013).....	134
Figure 6-21. Faerna, Maruja Rodriguez. Handmade silk handkerchief, c1950.....	135
Figure 6-22. Forlano, Penelope. <i>The Unforgotten</i> (detail) 2013.....	136
Figure 6-23. Faerna, Maruja Rodriguez and Penelope Forlano. <i>Embroidery illustration</i> . Scanned and recomposed illustration by Maruja. c 1949, composition 2013.....	136
Figure 6-24. Faerna, Maruja Rodriguez. <i>Maruja's lacework</i> c1949.....	136
Figure 6-25. Forlano, Penelope. <i>From the Skies</i> , public art sculpture/acoustic wall, elevation (diagram), 2015.....	138
Figure 6-26. Forlano, Penelope. <i>From the Skies</i> , public art sculpture/ acoustic wall, overall view, 2015.....	139
Figure 6-27. Forlano, Penelope. <i>From the Skies</i> , (detail of perforations and quote), 2015.....	139
Figure 6-28. Forlano, Penelope. <i>From the Skies</i> (detail), 2015.....	139
Figure 6-29. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , Fremantle College. Elevation drawing, Forlano, 2017.....	143
Figure 6-30. Forlano, Penelope. <i>Kaleidoscopic Wave</i> (partial view eastern side), 2017.....	144
Figure 6-31. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , 2017.....	145
Figure 6-32. Forlano, Penelope. <i>Kaleidoscopic Wave</i> (west end), 2017.....	146
Figure 6-33. Forlano, Penelope. <i>Kaleidoscopic Wave</i> (view up through skylight), 2017.....	147
Figure 6-34. Forlano, Penelope. <i>Marri-Kingia Past</i> series for Byford Secondary College. Elevation diagram, 2016.....	149
Figure 6-35. Pugin, Augustus. <i>Trellis</i> , c1874 (1980's reprint).....	150
Figure 6-36. Forlano, Penelope. <i>Pugin's Trellis of Marri-Kingia Insects</i> , partial shop drawing, 2016.....	150
Figure 6-37. Forlano, Penelope. <i>Pugin's Trellis of Marri-Kingia Creatures</i> (repeat pattern), 2016.....	150
Figure 6-38. Fauna of the Marri-Kingia Ecology (photographs) WA Museum, 2016.....	151
Figure 6-39. Forlano, Penelope. <i>Pugin's Trellis of Marri-Kingia Insects</i> , presentation drawing showing each individualised pattern integrated into the architectural elevation, 2016.....	152
Figure 6-40. Forlano, Penelope. <i>Pugin's Trellis of Marri-Kingia Insects</i> , balustrade installed. Forlano, 2017.....	152
Figure 6-41. Forlano, Penelope. <i>Pugin's Trellis of Marri-Kingia Creatures</i> (façade viewed from exterior), 2017.....	153
Figure 6-42. Forlano, Penelope. <i>Pugin's Trellis of Marri-Kingia Creatures</i> , façade viewed from interior, 2017.....	153

Figure 6-43. Forlano, Penelope. <i>Pugin's Trellis of Marri-Kingia Creatures</i> , (detail of façade viewed from interior), 2017.....	155
Figure 6-44. Forlano, Penelope, 2018. <i>Detail of Marri tree bark and kino</i> (photograph).	156
Figure 6-45. Forlano, Penelope. <i>Marri Healing</i> (soffit), 2017.	156
Figure 6-46. Forlano, Penelope. <i>Marri Healing</i> (soffit detail), 2017.	156
Figure 6-47. Forlano, Penelope. <i>Marri Healing</i> , Corten steel screen and soffit, photo by Douglas Mark Black, 2017.....	157
Figure 6-48. Forlano, Penelope. <i>Encase</i> , elevation, 2015-16.....	158
Figure 6-49. Forlano, Penelope. <i>For Now, For All-ways</i> , elevation diagram, 2016-17.....	158
Figure 6-50. Forlano, Penelope. <i>En-case</i> , storage; 2015-16.	159
Figure 6-51. Forlano, Penelope. <i>En-case</i> , storage, 2015-16.	159
Figure 6-52. Forlano, Penelope. <i>En-case</i> , low configuration storage 2016.....	160
Figure 6-53. Meier, Mark. Typical 3-Axis CNC tenon joints (closed and open), n.d.	160
Figure 6-54. Fuzil, Denis. <i>Kuka chair</i> , n.d.	160
Figure 6-55. Forlano, Penelope. Detail of partially closed joint prototype, 2015.	161
Figure 6-56. Forlano, Penelope. Detail of closed joint of <i>En-case</i> . 2015.....	161
Figure 6-57. Forlano, Penelope. Drawing: Four unique junctions to <i>En-case</i> , 2016.....	161
Figure 6-58. Forlano, Penelope. <i>For Now, For All-ways</i> , 2017.....	163
Figure 6-59. Forlano, Penelope. <i>For Now, For All-ways</i> , (example arrangement), 2017.....	164
Figure 6-60. Forlano, Penelope. <i>For Now, For All-ways</i> , (example arrangement), 2017.....	164
Figure 6-61. Forlano, Penelope. <i>For Now, For All-ways</i> , (example arrangement), 2017. Forlano, 2017.....	164
Figure 6-62. Forlano, Penelope. <i>For Now, For All-ways</i> , (example arrangement), 2017.....	165
Figure 6-63. Forlano, Penelope. <i>For Now, For All-ways</i> , (example arrangement), 2017.....	165
Figure 6-64. Forlano, Penelope. <i>For Now, For All-ways</i> assembly process (clockwise from top left) 2017.	166
Figure 6-65. Forlano, Penelope. Drawing showing heights, 2017.	167
Figure 6-66. Forlano, Penelope. <i>FNFA</i> diagram, example of long credenza style configuration with base, 2016.....	167
Figure 6-67. Forlano, Penelope. <i>FNFA</i> diagram (examples of possible configurations, medium height with base), 2016.	167
Figure 6-68. Forlano, Penelope. <i>FNFA</i> diagram, corner configuration with side facing units or all units facing one way, with bases, 2016.	168
Figure 6-69. Typical example of the NOMI on-demand ordering website.	171
Figure 6-70. Typical example of the AtFAB open source ordering website.	171
Figure 6-71. Forlano, Penelope. <i>Hong Kong Skyline</i> , graphic, 2016.	173
Figure 6-72. Forlano, Penelope. <i>Hong Kong Skyline</i> , graphic engraved onto Walnut timber veneer, 2016.....	173
Figure 6-73. Forlano, Penelope. <i>NYC</i> , graphic, 2016.....	173
Figure 6-74. Forlano, Penelope. <i>NYC</i> , graphic engraved onto walnut timber, 2016.....	173
Figure 6-75. Forlano, Penelope. <i>London</i> , graphic, 2016. Note: repeat pattern shown.....	174
Figure 6-76. Forlano, Penelope. <i>London</i> , graphic engraved into white board, 2016.....	174
Figure 6-77. Forlano, Penelope. Patterned box from India, n.d. Photo by client.....	174
Figure 6-78. Forlano, Penelope. <i>India</i> , graphic, 2016.....	175

Figure 6-79. Forlano, Penelope. <i>India</i> , graphic engraved into veneer, 2016.....	175
Figure 6-80. Forlano, Penelope. <i>India and Empire State Bldg.</i> , graphic, 2016.	175
Figure 6-81. Forlano, Penelope. <i>India and Empire State Bldg.</i> , engraved, 2016.....	175
Figure 6-82. Forlano, Penelope. <i>St. Paul's and Perth bush</i> , graphic, 2016.....	176
Figure 6-83. Forlano, Penelope. <i>St. Paul's and Perth bush</i> , graphic engraved onto veneer, 2016.	176
Figure 6-84. Forlano, Penelope. <i>Childhood memories of Perth bush</i> (pattern cropped) graphic, 2016.	176
Figure 6-85. Forlano, Penelope. <i>Childhood memories of Perth bush</i> (pattern cropped) engraved, 2016.....	176
Figure 6-86. Forlano, Penelope. <i>Cicada Wall</i> graphic, 2016.	176
Figure 6-87. Forlano, Penelope. <i>Cicada Wall</i> graphic, engraved. 2016.....	176
Figure 6-88. Forlano, Penelope. <i>Banksia, gum leaves and geckos</i> , graphic, 2016.	177
Figure 6-89. Forlano, Penelope. <i>Banksia, gum leaves and geckos</i> , graphic engraved, 2016.	177
Figure 6-90. Forlano, Penelope. <i>Lobelia orchid and dragonfly</i> , graphic, 2016.....	177
Figure 6-91. Forlano, Penelope. <i>Lobelia orchid and dragonfly</i> , engraved onto veneer, 2016....	177
Figure 6-92. Forlano, Penelope. <i>Lobelia</i> , graphic, 2016.....	177
Figure 6-93. Forlano, Penelope. <i>Lobelia orchid</i> , engraved onto veneer, 2016.....	177
Figure 6-94. Forlano, Penelope (composition). <i>Three childhoods</i> , graphic, 2016. Note: incorporates hand illustrations by client.	178
Figure 6-95. Forlano, Penelope. <i>Three childhoods</i> , graphic engraved, 2016.	178
Figure 6-96. <i>Weekends in London</i> , graphic. 2016 Hand illustration by client.....	179
Figure 6-97. <i>Weekends in London</i> , engraving, 2016. Forlano, 2016.	179
Figure 6-98. <i>JJ's London</i> , drawing. Drawing by client's daughter, recomposed and prepared for engraving by Forlano, 2016.....	179
Figure 6-99. Forlano, Penelope. <i>JJ's London</i> , engraving, 2016.	179
Figure 6-100. Forlano, Penelope. <i>Hot summer walk</i> , 2017.....	180
Figure 6-101. Forlano, Penelope. <i>Hot summer walk</i> , digital print on plywood, 2017.	180
Figure 6-102. Forlano, Penelope. <i>Wanderings</i> , 2017.	180
Figure 6-103. Forlano, Penelope. <i>Wanderings</i> , digital print on plywood, 2017.	180
Figure 6-104. Forlano, Penelope. <i>Francis and Willy</i> , 2017.	180
Figure 6-105. Forlano, Penelope. <i>Francis and Willy</i> , digital print on plywood, 2017.....	180
Figure 6-106. Forlano, Penelope. <i>St. Mary</i> , 2017.	181
Figure 6-107. Forlano, Penelope. <i>St. Mary</i> , digital print on plywood, 2017.	181
Figure 6-108. Forlano, Penelope. <i>City Walk</i> , 2017.	181
Figure 6-109. Forlano, Penelope. <i>City Walk</i> , digital print on plywood, 2017.....	181
Figure 6-110. Forlano, Penelope. <i>Wrought</i> , 2017.....	182
Figure 6-111. Forlano, Penelope. <i>Wrought</i> , digital print on plywood, 2017.....	182
Figure 6-112. Forlano, Penelope. <i>Cathedral Stories</i> , 2017. Photos and composition	182
Figure 6-113. Forlano, Penelope. <i>Cathedral Stories</i> , digital print on plywood, 2017.....	182
Figure 6-114. Forlano, Penelope. <i>Beaches and Caves</i> , 2017.....	182
Figure 6-115. Forlano, Penelope. <i>Beaches and Caves</i> , digital print on plywood, 2017.	182
Figure 6-116. Forlano, Penelope. <i>Rainforest Tree Climbing</i> , 2017.....	183

Figure 6-117. Forlano, Penelope. <i>Rainforest Tree Climbing</i> , digital print on plywood, 2017.	183
Figure 6-118. Forlano, Penelope. <i>Ripples</i> , 2017.	183
Figure 6-119. Forlano, Penelope. <i>Ripples</i> , digital print on plywood, 2017.	183
Figure 6-120. Forlano, Penelope. <i>Mary Mack, Mack, Mack...</i> , 2017.	183
Figure 6-121. Forlano, Penelope. <i>Mary Mack, Mack, Mack...</i> , digital print on plywood, 2017.	183
Figure 6-122. Forlano, Penelope. <i>Collective Memories</i> , 2017.	184
Figure 6-123. Forlano, Penelope. <i>Collective Memories</i> , digital print on plywood, 2017.	184
Figure 6-124. Forlano, Penelope. <i>Ocean beads</i> , engraving on timber (angled view), 2017.	185
Figure 6-125. Forlano, Penelope. <i>Ocean beads</i> , engraving on timber (parallel view), 2017.	185
Figure 6-126. Forlano, Penelope. <i>Seeds</i> , engraving on timber (parallel view), 2017.	186
Figure 6-127. Forlano, Penelope. <i>Seeds</i> , engraving on timber (angled view), 2017.	186
Figure 6-128. Forlano, Penelope. <i>Dancing Octopi</i> , engraving on timber, 2017.	187
Figure 6-129. Forlano, Penelope. <i>Anemone Field</i> , engraving on timber, 2017.	187
Figure 6-130. (participant), Screen shot of a portion of participant’s artwork, 2015.	188
Figure 7-1. Refined and expanded chart of ‘Strategies for Extending Product-user Relationships’, 2017. Forlano 2017. Adapted from Fuad-Luke (2010, 617).	202

Figures in Appendices

Figure E-1. Freedom Furniture. Catalogue cover, 2016.	242
Figure E-2. Harvey Norman. Catalogue cover, 2016.	242
Figure E-3. Domayne Furniture. Catalogue, November 2016.	242
Figure E-4. Furniture Bazaar. Furniture Catalogue, September 2016.	242
Figure E-5. <i>Style at Home</i> , Canada. Magazine cover, October 2016.	243
Figure E-6. <i>Chicago Home + Garden</i> . Magazine cover, Summer 2012.	243
Figure E-7. <i>Inside Out</i> - Australia. Magazine cover, n.d.	243
Figure E-8. <i>Elle Décor (UK)</i> . Magazine cover, June 2009.	243
Figure F-1. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia.	244
Figure F-2. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia.	244
Figure F-3. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia, 2016.	244
Figure F-4. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia, 2016.	244
Figure F-5. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia, 2016.	244
Figure I-1. Yb, Phillip. ‘Soil Drought’ Stock photo ID: 312820436 (n.d).	252
Figure I-2. Forlano, Penelope. Overall perforation patterning for rear wall, 2014.	253
Figure I-3. Forlano, Penelope. Patterning detail near top, 2014.	253
Figure I-4. Forlano, Penelope. Patterning detail near centre. 2014.	253
Figure I-5. Forlano, Penelope. Patterning detail at base showing text, 2015.	254
Figure I-6. Department of Astronomy, University of Wisconsin-Madison. Constellation of Orion, n.d.	255

Figure I-7. NASA. A color-composite image of the Pleiades from the Digitized Sky Survey, n.d.....	255
Figure I-8. Forlano, Penelope. <i>From the Skies (Pleiades detail)</i> , 2015. Photo by Robert Frith of Acorn. Photography courtesy of FORM and Perth Airport.....	256
Figure I-9. Forlano Penelope. Red-tailed black cockatoo photograph, 2014.	256
Figure I-10. Forlano, Penelope. <i>From the Skies (Orion detail)</i> , 2015. Photo by Robert Frith of Acorn. Photography courtesy of FORM and Perth Airport.....	256
Figure I-11. Forlano, Penelope. Carpet Python photograph, 2014.	256
Figure I-12. Google Earth. Exmouth (detail), 2015.....	257
Figure I-13. Forlano, Penelope. Perforation pattern for artwork, 2014.....	257
Figure I-14. Forlano, Penelope. Construction of artwork, 2014.	258
Figure I-15. Forlano, Penelope. Construction of artwork, 2014.	258
Figure I-16. Forlano, Penelope. Installation of artwork, 2014.....	258
Figure I-17. Forlano, Penelope. Installation of artwork, detail of perforated wall and aluminium hanging system, 2014.....	259
Figure I-18. Forlano, Penelope. Installation of artwork, 2014.....	259
Figure I-19. Forlano, Penelope. Installation of artwork, 2014.....	259
Figure I-20. Forlano, Penelope. Preliminary concept, reflected ceiling plan, 2014.....	260
Figure I-21. Forlano, Penelope. Preliminary concept, perspective sketch looking west, 2014.	261
Figure I-22. Forlano, Penelope. Preliminary concept, perspective sketch looking east, 2014.	261
Figure I-23. Forlano, Penelope. Perspective of final design, 2017.....	262
Figure I-24. Forlano, Penelope and Glen Oldfield. Final drawings of ‘oculus’ component, 2017.	262
Figure I-25. Forlano, Penelope and Glen Oldfield. Final model, view inside western sculpture, 2017.	263
Figure I-26. Forlano, Penelope and Glen Oldfield. Final model, view inside eastern sculpture, 2017.	263
Figure I-27. Forlano, Penelope and Glen Oldfield. Final model, view inside eastern sculpture, 2017.	264
Figure I-28. Forlano, Penelope. Test sample, 2017.....	265
Figure I-29. Forlano, Penelope. Test sample, viewing underside flanges, 2017.....	265
Figure I-30. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component A, opening to skylight, 2017.	265
Figure I-31. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component A, view into skylight, 2017.	265
Figure I-32. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component A, delivery to site, 2017.	265
Figure I-33. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component A, opening to skylight, 2017.	265
Figure I-34. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component A, installed, 2017.	266
Figure I-35. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component A, installed, 2017.	266
Figure I-36. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component B assembled, inside view, 2017.	266
Figure I-37. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component C assembled, inside view, 2017.	267

Figure I-38. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component D and E assembled in factory, 2017.	267
Figure I-39. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component F and G assembled in factory, 2017.	268
Figure I-40. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component G being installed, component F installed, 2017.....	268
Figure I-41. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , component F, being installed, 2017.....	269
Figure I-42. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , fully installed, with protective covering still in place, 2017.....	270
Figure I-43. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , completed, 2017. Forlano, 2017.....	271
Figure I-44. Forlano, Penelope. <i>Kaleidoscopic Wave</i> , completed, 2017. Forlano, 2017.....	272
Figure I-45. Forlano, Penelope. Render of proposed Corten screen, 2016.	273
Figure I-46. Forlano, Penelope. Corten screen in construction, 2017.....	273
Figure I-47. Forlano, Penelope. Corten screen being installed, 2017.....	273
Figure I-48. Forlano, Penelope. Overall design of <i>Marri Healing</i> soffit, 2017.....	274
Figure I-49. Forlano, Penelope. Detail of design translated into perforations for <i>Marri Healing</i> soffit, 2017.	274
Figure I-50. Forlano, Penelope. Final installation view of balustrade, photo by Douglas Mark Black, 2017.....	274
Figure I-51. Forlano, Penelope. Final interior view of facade, photo by Douglas Mark Black, 2017.....	275
Figure I-52. Forlano, Penelope. Final exterior view of facade, photo by Douglas Mark Black, 2017.....	275
Figure J-1. Forlano, Penelope. ‘ <i>Clamex</i> ’ test, 2017.....	276
Figure J-2. Forlano, Penelope. First lashing test with slots cut with hand-tools, 2017.	277
Figure J-3. Forlano, Penelope. Alternative cord trial, 2017.	277
Figure J-4. Forlano, Penelope. ‘G Code’ for CNC machining of slots, 2017.	277
Figure J-5. Forlano, Penelope. CNC slot test, 2017.....	277
Figure J-6. Forlano, Penelope. Sealing plywood, 2017.....	277
Figure J-7. Forlano, Penelope. Panels routed and sealed, 2017.	278
Figure J-8. Forlano, Penelope. Digital printing layout for the <i>FNFA</i> project, 2014.....	278
Figure J-9. Forlano, Penelope. Example of drawings for compositions based on interview responses, 2016-2017. <i>FNFA</i> project.	279
Figure J-10. Forlano, Penelope. Example of stain and engraving, 2017.	279
Figure J-11. Forlano, Penelope. Example of applied stain made from Eucalyptus leaf, 2016.....	280
Figure J-12. Forlano, Penelope. Final engraving pattern (for two 370 x 370 panels), 2016-2017.....	281
Figure J-13. Forlano, Penelope. Final engraving pattern (for two 370 x 370 panels), 2017.....	282
Figure J-14. Forlano, Penelope. Final lashing tests, 2017.	283
Figure J-15. Forlano, Penelope. Example configuration, 2017.	283

LIST OF TABLES

Table 5-1. Heirloom qualities in descending order according to survey responses. Forlano, 2017.	64
Table 5-2. Factors affecting person-object relationship endurance viewed as extremes along a continuum, 2017. Forlano, 2017.	66
Table 5-3. Enduring Design Framework Summary. Forlano, 2017.	68
Table 5-4. Survey responses regarding variations in bequeathment attitudes between males and females, 2017. Forlano, 2017.	75
Table 5-5. Designing for various degrees of interaction. Forlano, 2017.	86
Table 5-6. Summary of Enduring Design Framework principles and implementation examples	113
Table 6-1. Indicative online customisation and ordering map.....	170

Tables in Appendices

Table C-1. Respondents age, gender and occupation. Forlano, 2016.	234
Table C-2. Ownership attitudes by gender. Forlano, 2016.	234
Table C-3. Bequeathment attitudes by gender. Forlano, 2016	235
Table C-4. Design and experiential perception of heirlooms by profession. Forlano, 2016.	235

LIST OF ABBREVIATIONS

CAD/CAM	Computer-Aided Design/ Computer-Aided Manufacturing
CNC	Computer Numerical Controlled
DIY	Do it yourself
ESD	Environmentally sustainable design
EDF	Enduring Design Framework

ACKNOWLEDGEMENTS

Thank you to my thesis committee and supervisors, Dr. Dianne Smith, Dr. David Hawkins, and Dr. Nonja Peters for their guidance, support and expertise throughout the research process. Dianne in particular has encouraged and assisted me throughout the process from the very beginning. Her patience, commitment, and meticulous, questioning mind has been beyond invaluable. Only through the assistance of these supervisors could I have reached completion.

Thank you also to my intermittent advisors along the way, Dr. Philip Moore, Dr. Sandra Contreras, Dr. Christopher Crouch, Dr. Trent Jansen, and my three expert reviewers for broadening my perspective and understanding.

I also wish to thank Curtin staff who helped me navigate the ethics process in the Human Research Ethics office and particularly Dr. Catherine Gangell from the Office of Research and Development and the library staff, including Marilyn Coen.

I wish to thank those known, and unknown, participants in the surveys, clients and interviewees who kindly gave up their time to assist me, and put in significant effort to share their perspective on the research topic. Thank you so much to FORM, in particular Carolyn Karnovsky and Elizabeth Davis, for their support and nomination to compete for my first public art commission, *From the Skies*. Thanks to the commissioning bodies Artsource, Department of Education; consultants Maggie Baxter, Jenny Beahan; and architects Woods Bagot, JCY and TAG.

I would like to acknowledge and give thanks to Dr. Christina Houen of Perfect Words Editing for her professional editing services according to the guidelines of the Institute of Professional Editors (IPEd).

Attending my first conference in Adelaide and meeting like-minded people whom I still remain in contact with today has been personally and academically rewarding. Thank you to Curtin University, for their financial support through the Australian Postgraduate Award and Curtin Research Scholarship, and their conference attendance support.

Thanks to my post-grad study buddies, Loren Dyer, Jess Priemus, Vanessa Galvin, Nancy Spanbroek, Fiona Harman and Renee Parnell; I certainly couldn't have done it without your support and study discussions. These women are outstanding, inspirational and supportive peers. I would also like to give special thanks my family and friends, in particular Glen, Mitchell and Sean for letting me work late at night, encouraging me and being patient with me when I was preoccupied with all things PhD related.

DEDICATION

For Mum, Dad, Glen, Mitchell and Sean.

CHAPTER 1 INTRODUCTION

[T]he creation of product durability, a long-lasting solution to our throwaway culture, emerges as an absolutely vital element in the pursuit of sustainability.

— (Jackson, 2010, xvii)

My doctoral research through creative production takes a Design Anthropology approach to propose a design framework for private and community-based enduring built environment artefacts. My research questions are addressed in two languages (Milech and Schilo 2004); discourse analysis and creative practice, through Action Research cycles. This results in an exhibition of propositional private and public artefacts and an exegesis. Aligned with contemporary approaches to creative production research, I follow the praxis-exegesis model as a helical interdependent process of description, analysis, synthesis and reflection of practice and text (exegesis), and the creative exploration of alternative possibilities (Duxbury, Grierson, and Waite 2008; Gray and Malins 2004; Marshall 2010; Milech and Schilo 2004).

Design Anthropology ‘shift(s) the focus from anthropological description to action’ (Gunn, Otto and Smith 2013, xiv) by combining ‘contextualization and interpretation into the tasks of design, emphasizing the generative role of theory in developing design concepts and critically examining existing, often implicit conceptual frameworks’ (Otto and Smith 2013, 4). I align with this view that Design Anthropology’s valuable role is learning from the past to ‘develop... tools and practices of collaborative future making... to create contextual knowledge and to develop specific solutions’ (Otto and Smith 2013, 3). This approach also resists design de-futuring (Fry 2011), carries out design proposals, and potentially transforms future relationships to objects, and thereby, behaviour (Gatt and Ingold 2013; Otto and Smith 2013, 13; Verbeek 2005).

There is a strong recent tradition of collaboration between designers and anthropologists in the fields of technology and system design. However, my research contributes to the design of everyday built environment artefacts, and the emotional and psychological endurance of home possessions and integrated public art (architectural elements), thus entering less explored areas.

I take Thorpe's (2010) and Graeber's perspective that design research should reflect on wider Environmentally Sustainable Design (ESD) and social views; what Thorpe terms "cathedral thinking." My research focuses on "what is ultimately good, proper, or desirable in human life" (Graeber 2001, 2) in lieu of an economic view. It is located in Western contemporary consumer culture.

Primarily focused on the social and environmental benefits of emotionally enduring artefacts, the framework developed through this thesis considers human needs, rather than desires, by applying the lens of Maslow's *Hierarchy of Needs* (1943). The creative production of emotionally enduring artefacts is also considered commercially through 'real-life' budget and time-frame scenarios as part of this research, to ensure applicability of the theory.

Physical and emotional endurance

Some contemporary product and furniture design theorists investigate objects of emotional endurance and longer-lasting properties as part of a wider ESD strategy, commonly termed 'enduring' (Chapman 2005; Cooper 2010a; Fuad-Luke 2009; McKoy 2004; Walker 2006b; 2011b) or 'product life extension' (Bakker, den Hollander, van Hinte, and Zijlstra 2014; Linton and Jayaraman 2005). Developing a notion of enduring design raises the question: *how long is enduring?* My research is limited to the emotional endurance of artefacts suited to intergenerational use and reappropriation; that is to make another's artefact, one's own. I examine how artefacts emotional endurance can match their physical endurance, rather than examining physical endurance in isolation.

My study achieves this via a person-object relationship focus through intergenerational and heirloom objects which display emotional or psychological endurance, which henceforth in this thesis are referred to as *enduring*. Artefacts exhibiting these long-lasting qualities are often termed:

- special (Csikszentmihalyi and Rochberg-Halton 1981)
- beloved (Lastovicka and Sirianni 2013; Sirianni and Lastovicka 2011)
- cherished (Curasi, Price and Arnould 2004; Tobin 1996)
- keepsakes (Curasi, Price and Arnould 2004)
- inalienable (Curasi, Price and Arnould 2004; Roster 2013; Weiner, 1992)
- and 'attachment' artefacts (Ball and Tasaki, 1992; Chapman 2005; Cherrier 2010; Haws Naylor, Coulter, and O. Bearden 2012; Kleine and Baker 2004; Kleine, Kliene III and Allen 1995; Knez 2005; Lobos and Babbitt 2013; Mugge, Schifferstein and

Schoormans 2010; Savaş 2003; Thomson, MacInnis and Park 2005; Wallendorf and Arnould 1988).

Although differences exist between these terms, my motivation is to examine the emotional longevity drivers in material culture¹ and consumer behaviour research, and how this can be translated into an Enduring Design Framework and explored in design practice.

This project explicitly refers to longitudinal intergenerational engagement, which is not possible to fully test during this research period. The focus is on speculative solutions and longitudinal potentialities. To achieve this, I call on the body of research by material culture and consumer behaviour theorists and interpret this for its application to enduring design practice.

Disposal drivers

Historically, in recent centuries, consumers have sought new luxuries to emulate a higher status consumer that in time becomes commonplace, and the cycle repeats (Campbell 1987; Csikszentmihalyi and Rochberg-Halton 1981). Commencing as early as the 1800s, these slight shifts have now exponentially built up to a point, in the early twenty-first century, where current day furniture catalogues and magazines regularly market durable household furniture as 'seasonal' and thereby encourage aesthetic obsolescence (see Appendix E).

Design practice and industry has fed this consumption and production cycle (Cooper 2010b; Shove, Watson, Hand, and Ingram 2007; Sparke 1983), by developing built-in obsolescence of desirability, function and the technological (Packard 1961; Slade 2007). 'Featuritis', that is constantly adding functions that appear more convenient or better (Norman 2010, 41), and aesthetic choices such as irreparable or delicate surfaces (Garvey 2013; Walker 2006b, 87) are some examples of this. This is further discussed in Section 2.1.

When viewing Western design of the built environment through a sustainability lens, the discourse has resulted in a proliferation of policies and approaches worldwide. These include but are not limited to; design for environment, life cycle thinking, life cycle

¹ Material studies focuses upon artefacts "their properties and the materials that they are made of and the ways in which these... are central to an understanding of culture and social relations... culture and society are seen as being created and reproduced by the ways in which people make, design, and interact with objects." (Woodward, 2013 paragraph 1)

analysis, leadership in energy and environmental design, cradle-to-cradle, carbon footprint analysis, circular design, and green star ratings. Industry's response to environmental issues has largely focused on 'less damage' (Fuad-Luke 2009) and symptom-based approaches (Chapman 2005) rather than understanding and directing a real shift in consumption attitudes and emotion to material objects (Chapman and Gant 2007; Fry 2009, Fuad-Luke 2009; Verbeek 2005; van Hinte 2004).

While ESD policies exist, they rarely address emotional disconnection and disposal practices, thus failing to address the whole problem. This failure to address consumption practices is palpable in the 'rebound effect,' that is, when consumption increases overall due to perceived environmental gains in other purchasing decisions such as energy efficient design or lower carbon footprint (Fuad-Luke 2009, 49; van Hinte 1997, 63; Verbeek 2004, 208). While material and production aspects of ESD have been extensively debated and solutions proposed, discussion on shifting consumer behaviour toward retaining artefacts or sustainable consumption is lacking in the design field. This is partly responsible for the over-consumption phenomena and drives the need for this research.

Although particular past design movements or manifestos have contributed towards the perceptions of 'timeless' or universal built environment artefacts that don't stylistically date (Schiermer 2016), it is evident from the sheer increase in consumption, production and waste produced by the built environment and design industries, that in practice this approach has been naïve. Section 2.2 explores the assumption within design discourse that universal and 'classic' artefacts are necessarily enduring. I reflect upon the failure of design practice and discourse to further explore the person-object relationship and how a design anthropology approach can contribute to artefact endurance.

In section 2.3, I briefly explain how the enormous scope of design variation has contributed to excessive consumption and dispossession, and thereby waste (Chapman 2005, 2010; Hebrok 2014; Walker 2006b; 2011a). This has led to a shift in the last two decades, with designers and design theorists challenging aesthetic, technological and functional obsolescence and how this has raised the need for behaviour changing products (Acaroglu 2014; Chick and Micklethwaite 2011).

Several built environment design theorists argue strongly for sustainable consumption to complement technical sustainability (materials and processes) in a holistic approach to ESD (Chapman 2005; Fuad-Luke 2009; Manzini 1995; Thorpe 2010; Walker 2011b). Stuart Walker calls for "transformational change and shift in thinking" (2014, 25); Chapman advocates emotionally enduring design; Slow Design promotes slowing down

and reflecting upon consumption; and Fuad-Luke proposes a multi-pronged approach. All agree that a more comprehensive solution is for designers to encourage more sustainable consumption by consumers.

I demonstrate that a gap exists in this design discourse through analysing how the person-object relationship of attachment, heirloom and enduring artefacts can be used to inform a design approach. Just as design has encouraged throwaway attitudes through the design of artefacts, designers can consider how to better satisfy longer-term needs, and encourage consumers to care longer for their built environment artefacts. By unpacking the long-term person-object relationship and reappropriation processes, a set of twelve constituent enduring design approaches can inform an Enduring Design Framework.

As Elena Pulcini (2010) argues, despite consumers' knowledge of the environmental consequences of overconsumption, people do not shift their consumption behaviour. She raises the question of how to create behaviour change in individual consumption and its impact on the well-being of the "other" in a globalised world, which has more concern for accountability than care for others. She argues that an altruistic subject is often presupposed, but without an emotional engagement, behaviour remains unchanged (Ibid., 445-6).

I agree with Pulcini's argument for a need to connect to the emotions to encourage responsible behaviour. In Chapter 2, I argue why this is important in designing enduring artefacts. As Manzini asserts, "caring for objects can be a way of caring for that larger object that is our planet" (Manzini 1995, 239).

The theoretical perspective's application to my creative practice

Buildings and habitable spaces are generally composed of four main components; structures, services, surfaces (or linings), and objects (loose or fixed furniture). Surfaces and furniture will be the limitation of my creative practice within this thesis, as these are most often subjected to premature disposal, and are within my fields of professional expertise — interior architecture and furniture design. Specifically, I will explore large scale architectural surfaces and smaller scale domestic, loose furniture, for the following reasons.

Firstly, furniture typically necessitates durable construction, and domestic functional needs are relatively stable over decades and have high potential for enduring use. Yet

increasingly, domestic furniture has been subject to marketing practices encouraging 'seasonal' replacement and yearly fads (Garvey 2013, 76). In previous centuries, furniture was typically bequeathed inter-generationally. However, in recent times this practice has fallen from favour because of significant economic, lifestyle and cultural changes. With the rising interest in conscious and sustainable consumption, bequeathing and reappropriation practices are ripe for revival, given the right set of design and consumer circumstances. Furthermore, domestic furniture is used daily in private spaces, and is not as suited to other sustainable consumption practices such as the 'sharing economy'² model.

Secondly, I explore built environment component 'surfaces' such as non-structural cladding or linings, because these are increasingly prematurely disposed of, much like furniture, due to perceived aesthetic obsolescence rather than performance failure. Building surfaces also add a layer of complexity to this research project. I explore emotional engagement with surfaces on a larger scale and for less accessible users than is possible when designing domestic artefacts. Building surfaces are not typically possessed or appropriated by users as is possible with furniture. Building elements are less physically engaging or capable of being controlled. Thus, my research explores if and how the findings from the person-object relationship can be applied to building surfaces and elements.

The built environment works completed were commissioned through competitive tender processes and explore the real-life applicability of my enduring design approach, process and manufacturability. I designed soffit linings, balustrades, a glass façade, a screen and an acoustic wall treatment within existing and new buildings, as *enduring artefacts*. Thus, I explore creatively the theory and generate ideas not only through practice, but with genuine time-lines, people, constraints and budget. This demonstrates how designers can design, not for temporal needs, but for enduring person-object relationships across a range of built environment components.

² "[T]he sharing economy enables a shift away from a culture where consumer's own assets (from cars to drills), toward a culture where consumers share access to assets" (Martin 2016). The shared economy is widely viewed as enabling a reduction in overall consumption. (Belk 2014; Botsman and Rogers 2010; Martin 2016).

Research Questions

I seek to respond to the following research questions:

- What are the characteristics of the person-object relationship of enduring artefacts, and how may this relationship inform a design framework?
- What is the potential impact of a design anthropology approach on designing enduring built environment artefacts?
- Reflecting upon my personal practice, how has my personal design practice shifted in relation to designing for endurance?

1.1 GENDERED PRACTICE

The Meaning of Things (Csikszentmihayli and Rochberg-Halton 1981) and other texts (Dittmar 1991; Gregson and Crewe 2003; Wallendorf and Arnould 1988) identified that distinct gender differences exist in object attachment. Females³ typically have a disposition toward contemplation or relational attachment artefacts (Csikszentmihayli and Rochberg-Halton 1981; Dittmar 1991, 167) and males typically have a disposition to “self-oriented and activity” (Dittma 1991, 167) or ‘action objects’ (Csikszentmihalyi and Rochberg-Halton 1981, 221). My twenty-year experience as a female designer and consumer confirms this distinction.

Although the literature highlights significant overlap and commonalities, it also shows that many male authors focus upon enduring artefacts with examples of action or functional objects, whereas women authors focus more on artefacts that reflect relationships, nurturing, or a kinship narrative.

Gregson and Crewe note that women are more likely than men to dispose of or bequeath domestic household items to ‘deserving others’ (2003, 112). As a female researcher, I too focus on solutions that encourage intergenerational bequeathment or passing on to others, via the design of domestic artefacts that provoke contemplation. While I respect masculine and feminine perspectives, the built environment is a male dominated design area (Matthewson 2012; Navarro-Astor, Román-Onsalo, and Infante-Perea 2017, Stead 2014). Thus, the feminine perspective enables me to fill a research and practice gap.

³ This research retains the terminology of women, females, men and males as per the source material.

1.2 RESEARCH SCOPE

While influences upon artefact endurance are manifold, my limitation is on emotional and psychological endurance, by combining material culture, human geography and with future solutions through design practice contributes to the Design Anthropology field.

Material culture research also provides a deeper understanding of objects in use, in terms of how artefacts mediate user practices over time, and how they may act as a 'social other'. Furthermore, human geographers Nicky Gregson and Louise Crewe examine object agency and consumption over time through ownership exchange. Although some design theorists do discuss the role of object narrative, few if any delve as deeply as anthropologists or geographers, into the highly emotive and socially laden understanding of the 'inalienable' or singularised artefact that is irreplaceable. As such, my research examines material culture theory as it pertains to an artefact's emotional endurance, in order to build upon previous research, deliver new knowledge, and interpret how a designer may encourage these experiences.

Included in the literature review is work by design theorists who examine object endurance through the mainstream design perspective of an artefact's practical or instrumental functionality and its product language; that is signs, semiotics and its formal-aesthetic function. I include a further post-phenomenological consideration into this mix. Rosenberger and Verbeek describes how post-phenomenology takes relational approach of phenomenology further by "reconceptualising the intentional relation... [by] investigat[ing technological artefacts] fundamentally mediating character... [and the] subject and object are constituted in their mediated relation" (2015, 12). This perspective this enables me to better understand the role of artefacts in mediating human activity, and identify the criteria associated with artefacts that are most emotionally enduring. That is, how this mediated relationship makes an artefact an heirloom, and the human a custodian.

Figure 1-1 unpacks each disciplinary lens through which to examine object longevity and corresponding foci. The first disciplinary lens is commerce, which typically examines how the sales, services and the systems of products that surround the artefact can extend or reduce product life and impact the manufacture and design. Due to the extensive and established knowledge in the commercial area,⁴ it is excluded from my research project.

⁴ For information on this topic see *The Scenario of a Multi-local Society* (Manzini 2007), *Product-Service Systems and Sustainability* (Manzini and Vezzoli 2002), *Sharing Economy* (Heinrichs 2013)

Theorists of design, the second disciplinary lens, typically examine object longevity from the pervasive understanding that an artefact is predominantly analysed practically through its instrumental functions, technically through its making and physical longevity, and visually through product language, that is, interpreting meaning from appearance (Verbeek 2005, 206). While contributions by Jonathon Chapman (2005; 2010) and Stuart Walker (2006b; 2010; 2011b; 2014), do begin to consider the experiential and aspects of the social, my research demonstrates that it can be more comprehensively explored.

It is the field of material culture (incorporating consumer behaviour) within anthropology that gives the greatest insight into the experience of artefacts, particularly change over time, and this process is crucial to my research. This approach generates new knowledge and contributes to the theory and practice of designing enduring artefacts. The interaction of design theory and practice with an anthropological lens provides a symbiotic understanding of object longevity. The key theorists for this topic in this discipline are noted in Figure 1-1.

The scope of this project excludes the ability to thoroughly examine behaviour change processes. I create commercial, public and viable propositional objects that are able to be lived with, rather than creating works to shock, or be critical, as the latter rarely engenders change in everyday life.

1.3 RESEARCH GAP AND SIGNIFICANCE

Van Hinte states in *Eternally Yours* that “it is doubtful whether this ‘emotional bond’ makes much sense, since truly ‘emotional’ relationships between users and objects are rarely and hardly subject to design” (van Hinte 2004, 79-81). My research directly challenges this notion and explores this gap. I aim for design to move beyond just identity or status to incorporate emotion. By viewing it as a post-acquisition phenomenon occurring through user experience over time, I explore personal meaning and custodianship of material, everyday built environment artefacts and what the enduring person-object relationship entails.

Personal meaning⁵ is a growing research area within design theory and is acknowledged as a gap in the development of sustainable and enduring design (Walker 2011b, 106). In

and *Debating the Sharing Economy* (Schor 2016).

⁵ Also used interchangeably with 'spiritual meaning' by Walker (2010, 95; 2014).

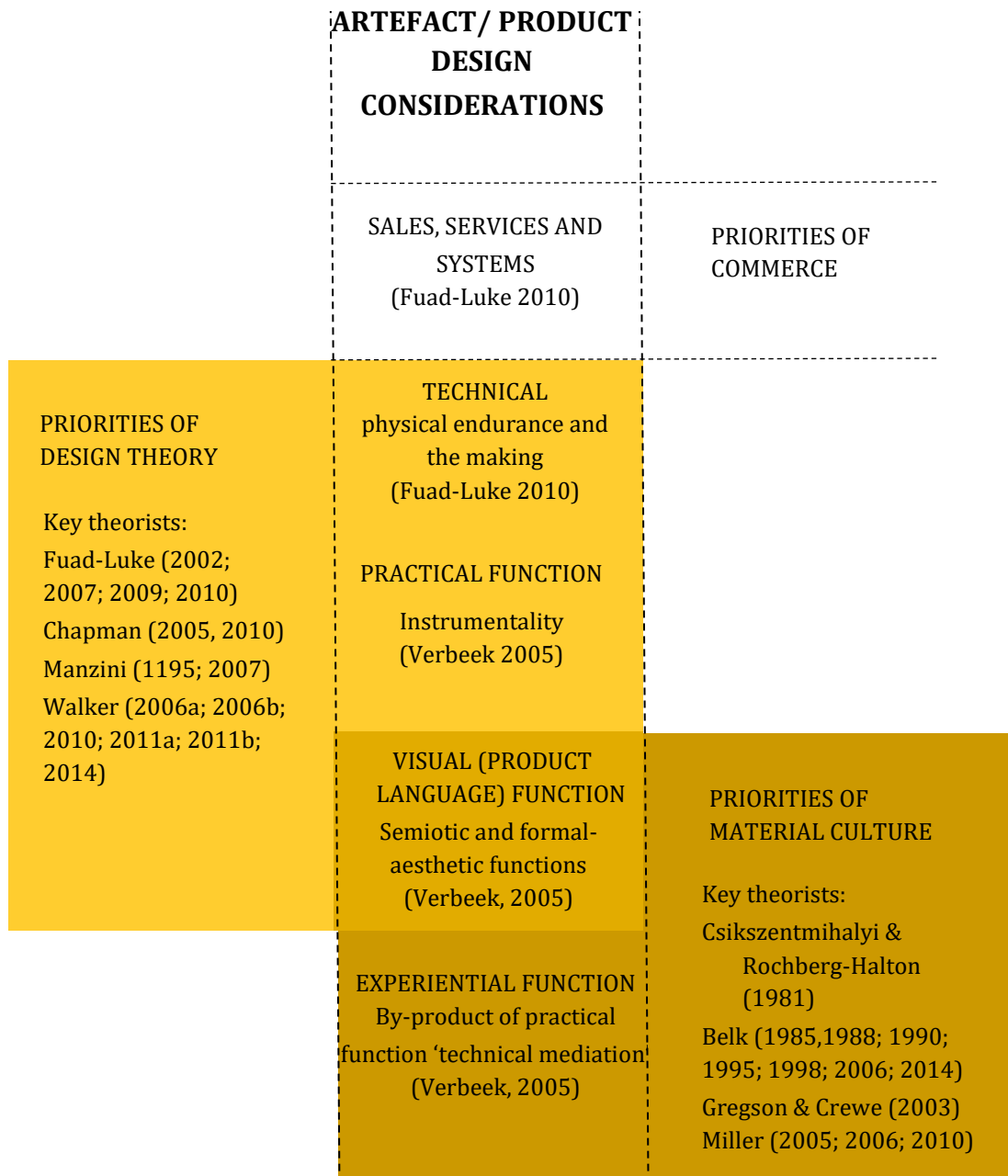


Figure 1-1. Disciplinary-based analytical priorities of existing theory regarding artefact/product design. Forlano, 2017.

an era of globalisation, de-materialised everyday practices, high material waste, and the alienated individual, debates surround the effects of contemporary artefacts on personal wellbeing. The ‘making’ of personal and public identity through artefact consumption is most significantly explored; in people’s homes (Csikszentmihalyi and Rochberg-Halton 1981; Kleine, Kleine III, and Allen 1995; Miller 2010); across Western and non-Western societies (Wallendorf and Arnould 1988); and mental states (Goffman 1969, Wallendorf and Arnould 1988), signalling the broad implications for this study.

Figure 1-2 explicates the positioning of a typical domestic artefact. Although domestic heirlooms are commonly associated with significant places, people or events (Csikszentmihalyi and Rochberg-Halton 1981), there are many such artefacts from significant events, for example, that are not typically denoted as heirlooms (as shown in the left quadrants of the chart) due to their lack of material endurance. Nor do all artefacts become objects of attachment (as shown in the lower right quadrant). But it is the social mediation of the physically enduring artefacts, that through life experience, may lend itself to becoming significant and enduring (as shown in the top right quadrant) which I focus upon.

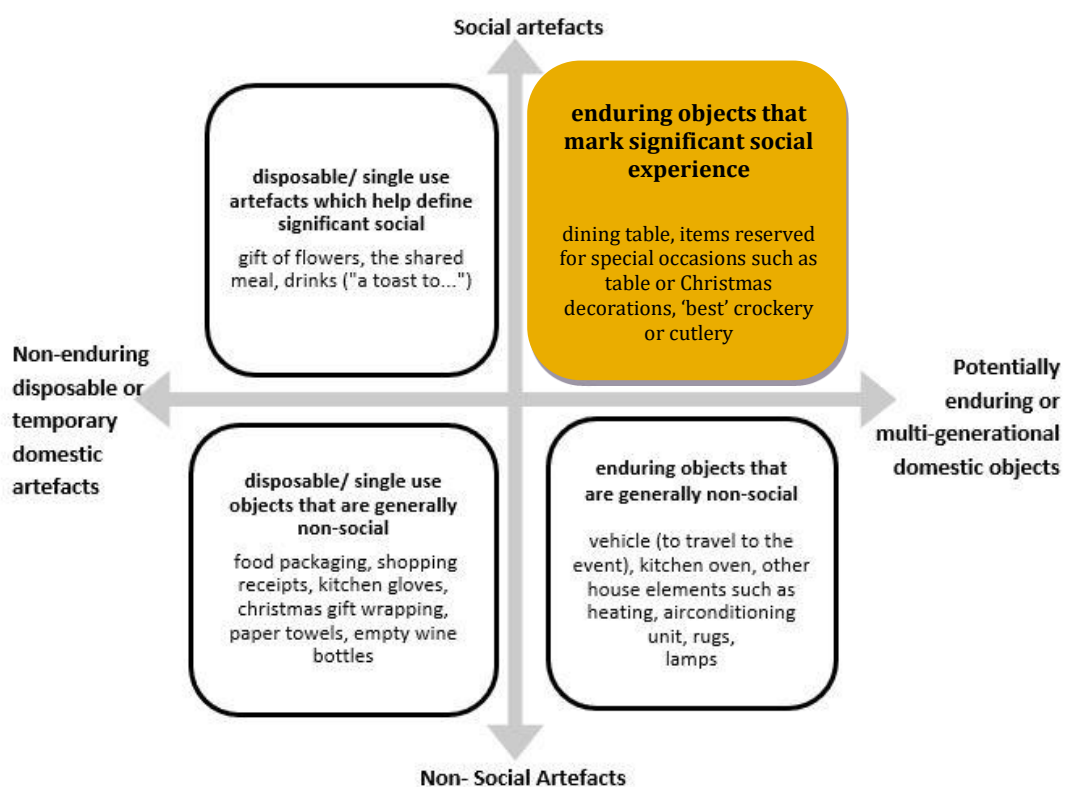


Figure 1-2. Significant social experiences and materiality matrix. Forlano, 2017.

The more physically enduring of these social artefacts present the greatest opportunity for designers to endeavour to match the artefact's social and emotional longevity to its physical and material durability. My research does not claim that all artefacts associated with significant events can or even should become enduring. However, physically durable furniture is increasingly prematurely disposed of (Naish 2008, 95) and this mismatch highlights the significance for designers to consider objects' emotional longevity.

The need to take this ethical social and environmental stance is based on recent findings. From 2009 to 2016, furniture consumption globally has seen a yearly growth of 35% to US\$455bn (World Market Intelligence 2016). The disposal of functioning goods in Western culture is prevalent (Cooper 2010b, Crocker 2016, Hamilton and Denniss 2005, Whybrow 2005). For every tonne of goods reaching the consumer, thirty times more waste is created, and of the goods created, 98% are discarded within six months (Datschefski 2001; Fuad-Luke 2007, 23); of material flow, only 1% is retained in six months in North America (Hawken, Lovins, and Lovins 1999, 81) (see Figure 1-3).

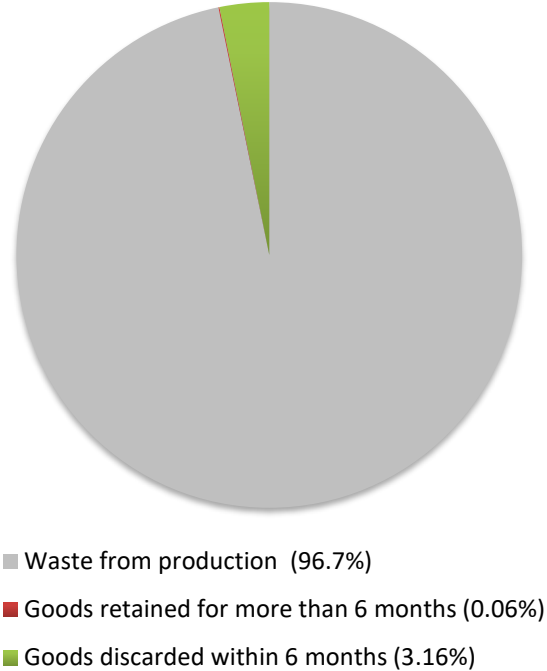


Figure 1-3. Pie chart comparing tonnage of waste and goods during the production process. Forlano, 2017.

When we consider the compounding effect of the discarded products being replaced with more products after six months, the argument for lessened production volume and greater emotional durability to reduce disposal of the physically enduring is strong. Although these statistics refer to goods generally, the built environment is part of this problem. Yet it is debatable that design practitioners are considering their role in the growth in waste.

Although user-centred (human-centred) design has begun to adopt methods and research from psychology, ethnography and anthropology in product design, this is largely motivated by profit, to create product differentiation (Shove et al. 2007; Slade 2007) or betterment and is typically applied to electronic products (Slade 2007).

Furthermore, enduring design theory also largely focuses on electronic objects (Bleviss 2007; Chapman 2005; Jung et al. 2011; Lobos and Babbitt 2013). Although some researchers may occasionally refer to furniture or built environment artefacts, their studies focus on the longevity of electronic artefacts with relatively fleeting technologies (Chapman 2005; 2010; Walker 2006). Their propositions are generalised as applicable to non-electronic or technology dependent artefacts. There exists, therefore, a research gap that specifically examines the emotionally enduring built environment artefacts.

My research explores this gap through the creative production of built environment artefacts at various scales. It is therefore of major significance to the design industry, public art practitioners and commissioners, and academics in the fields of anthropology, material culture, consumer research, design and architecture theory and practice.

It is social experience that contributes to the irreplaceability of artefacts (Belk 1988; Csikszentmihalyi and Rochberg-Halton 1981; Grayson and Shulman 2000; Wallendorf and Arnould 1988), yet this is widely underexplored in the design literature. While issues of narrative, aging and co-creation have been discussed within design, other aspects of artefact endurance in relation to the social and emotional are under-theorised. I discuss and explore through design how deep emotional connections may be encouraged through the design and making of artefacts to evoke custodian-like practices, or as Crocker terms them, 'custodial consumers' (2016, 157).

As such, my research focuses on what designers of furniture and built environment can do to curb the practice of built-in *psychological obsolescence*, that is, aesthetic, functional, or symbolic obsolescence (Cooper 2004, 427; Slade 2007), to complement sustainable design and production research. As Fuad-Luke points out, it is behavioural changes⁶ that designers now need to promote in their practices (2009, 60). As Crocker argues "we need to actively steer consumption towards sustainable... enjoyable consuming as the 'custodians' of our possessions" (2012, 213). My research fills this gap in the currently 'fragmented' field of Design for Behaviour Change⁷ as defined by Niedderer et al. (2016, 67), as it specifically aims to encourage custodial practices.

⁶ Design for behaviour change (and sustainable consumption) theory is an emerging field. Research suggests altering behaviours towards products can result in environmental benefits such as reduced consumption, although this is largely related to services and electronic products, and human-centred design (HCD) (Genus 2016; Hankammer et al. 2016; Jelsma and Knot 2002; Jelsma 2006; Verbeek 2006) or focused upon the theory of psychological shifts (Davison, Thompson, Sharp, and Dawson, 2013).

⁷ This research does not aim to provide an analysis of behaviour change as a process, as this falls outside the scope of my research.

Despite the swing against repair from the 1980s, recent years has shown a growth in interest, evidenced in online forums and workshops for layperson repair, traditional and online publications for home DIY repair, DIY IKEA hacking, up-cycling magazines and websites,⁸ marketplace for online sales of up-cycled objects,⁹ open source websites with making instructions, templates or digital files for local fabrication,¹⁰ and the like. However, this 'repair' culture is largely driven by non-designers, although there are exceptions within furniture design, such as the work of Guy Keulemans (2015) and Niklavs Rubenis (2015).

Although work is being done in the technical area for artefact endurance and circular design, emotional attachment to minimise psychological obsolescence is a lesser explored area (Bakker, Wang, Huisman, and Den Hollander 2014, 15). Anthropological and material culture findings through the behavioural study of custodians and aficionados and why they maintain and care for artefacts longer than mainstream consume-and-discard practices, addresses this gap.

As examined by Fuad-Luke, despite the external campaigns and pressure for ESD solutions, *Design for the 21st Century* (2003) demonstrated that only 5% of designers claim to have concerns for the environment or society (and even less as a priority) in their daily work (Fuad-Luke 2009, 52). Presumably of that 5%, even fewer are designing for longevity to benefit societal and individual well-being combined with ESD concerns regarding furniture and waste.

My observations and research into furniture design practice reveal that few contemporary designers take on the enduring principles tacitly or otherwise as a way of creating enduring design. My research is, therefore, original in its focus on a noteworthy topical design gap.

1.4 AIMS AND OBJECTIVES

My research aims to respond to gaps in existing knowledge, solve problems and correct omissions in enduring design theory, and contribute to what Ann Thorpe refers to as the

⁸ Woodworking and hobbyist's websites such as www.savedbylovecreations.com, and countless *Pinterest* sites are devoted to up-cycling, re-use and repair.

⁹ *Remade in Britain* is a website devoted to selling a wide range of up-cycled objects www.remadeinbritain.com.

¹⁰ The open source design approach has sparked a new specialisation within design such as AtFAB (Filson and Rohrbacher 2016) and Open Desk (Fabbed.Limited 2016)

'second phase' of sustainability (2007, 5), that is, *sustainable consumption*.

My objective is to propose an Enduring Design Framework with creative production examples within the built environment field to explore potentialities. I seek to achieve this with reference to anthropological and consumer behaviour findings not previously addressed in the design theory of enduring artefacts. I will also contextualise this within my creative practice outcomes.

My objective includes developing alternative ways of encouraging a custodian-heirloom relationship. I do this by identifying material and immaterial qualities in the designing and making of artefacts, and by reflecting on my thinking process and critique of the final outcomes. The aim is to specifically enable the use and interpretation of the Enduring Design Framework by other design professionals across the fields of furniture design, interior architecture, architecture and public art.

Furthermore, I seek to contribute to the emerging field of design anthropology by unearthing new connections between design practice and anthropology.

The main purpose of my research is to challenge the trend that has emerged in recent decades of disposing of functioning furniture or architectural elements to keep up-to-date with new 'styles' encouraged by design, and the 'rebound effect' which encourages greater consumption (Fuad-Luke 2009, 49; van Hinte 1997, 63; Verbeek 2004).

1.5 DOCUMENT MAP

Figure 1-4 maps this document's order. Chapter 2 identifies the understandings of designing for psychological or emotional endurance in design industry discourse from the twentieth century to the contemporary context and explains the methodological decisions and theoretical positioning. Chapter 3 describes the methodological approach and how the exegesis and creative production together form the two differing yet synchronous ways to answer the research questions.

In Chapter 4 I examine material culture research that explicates the person-object relationship of custodians and their enduring artefacts. In this chapter I also identify overlaps and gaps, and extrapolate the key concepts missing in design practice and discourse. The theorists' research is synthesised with my data collection (interviews and survey) from this chapter onwards. I then identify a peculiarity of enduring artefacts that is not entirely captured by Verbeek's post-phenomenological perspective, and how

reappropriation rituals can be considered by designers.

An Enduring Design Framework with practice exemplars is articulated in Chapter 5. I then explicate the creative production process and outcomes and how practice and theory inform, and have been informed by the framework, in Chapter 6. I conclude with the findings and contributions of this research in Chapter 7.

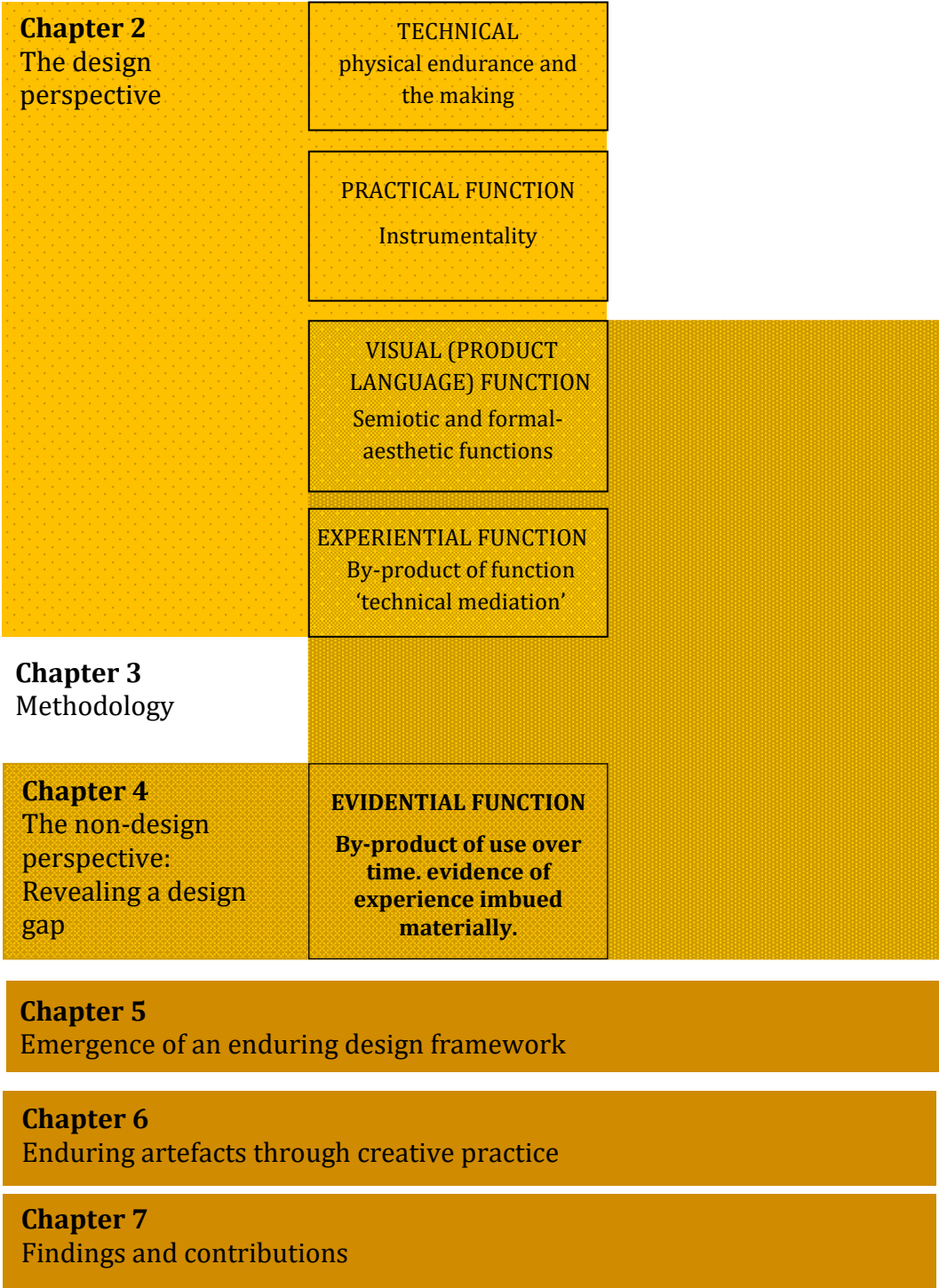


Figure 1-4. Document Map diagram. Forlano, 2017.

CHAPTER 2 THE DESIGN PERSPECTIVE

The contextual literature review firstly identifies the central challenges in designing for changing attitudes, needs and practices, with an overview of the historical design approach to longevity. I then focus more closely on recent theories of enduring design by leading contemporary theorists within the field. This discussion sets the background for understanding the existing gap in design theory and the context for the proposed methodological and theoretical perspective.

2.1 THE HISTORICAL CONTEXT OF ENDURING DESIGN

Design institutions and designers generally take the position that functional and modernist principles are *classic* and thereby enduring (Hebrok 2014). This is primarily driven by the *Werkbund*¹¹, Modernism, and Hermann Muthesius' influential writings on "typisch — the expression of a collective ideal" (Naylor 1990, 167). Modernist approaches endeavoured to create a classic universality based on "objectivity, reason and intellect [to] replace... intuition, individuality and creativity" (Ibid., 166). While Modernism was expected to allow the masses emotional freedom from the past, it caused alienation by trying to reflect homogeneity (Greenhalgh 1990, 17; Miller 2010, 84; Walker 2014, 117).

Universality as classic, timeless and enduring, emerged to impose 'universal good taste' by the design elite upon the masses (Greenhalgh 1990). For Muthesius and others, Modernism was the rejection of personal meaning in favour of creating the "cultivated man" (Loos 1908 Transl. 1998, 21). Taken from the perspective of the consumer, Modernism widely ignores the person-object relationship and associated experiences over time. Universal good taste addresses concepts related to physical longevity, practical function and product language function. The 'classic' and timeless designs of modernism may endure in some segments of the community but fail to consider the individual experience that leads to emotional endurance.

¹¹ *Werkbund* (German Association of Craftsmen) were the highly influential group which informed the development of the Bauhaus.

What 'classic' design does achieve is what Schiermer identifies in his study, and Simmel's view reinforces: "The 'classic' is a concentration of appearance around a sublime middle point... which does not offer so many points of attack" (2016, 129). Given this perspective, it is clear why some artefacts are more aesthetically long lasting than others; however, this 'middle point' simultaneously limits expression and identity.

Modernism's focus was on the "perfection of production" (Greenhalgh 1990, 14) and notions of timeless and longevity of design aesthetic, with limited regard for the person-object relationships (Ibid). As faster mechanised production dominated, identifying markers of origins, individuality, place and time were also stripped. Likewise, transcendence was claimed to occur through the purity of form (Muthesius translated in Conrads 1989, 27). This has led some contemporary design critics to argue that Modernism has generally increased consumption by idealising the new and rejecting the past (Crocker 2016, 80), and by the removal of decoration, lack of personal meaning, and disconnection (Walker 2014, 117). Modernism was of "everywhere and nowhere" (Hoskins 2006, 78).

The focus on design with minimal "points of attack" (Schiermer 2016, 129) to remain enduring is problematic. This is self-evident in the mass of solid wood, robustly constructed, simple and modernist designs that are not iconic, and are dumped on verge side collections for waste (Appendix F), sit idle in opportunity shops, or are sent to garbage tips in huge volumes, year after year. The modernist pieces that do endure, such as works by Charles and Ray Eames, Arne Jacobsen and Hans Wegner and others (Hebrook 2014, 213; Fiell and Fiell 1991, 53-55), are typically iconic works that have, for other reasons become collectable or intergenerational.

If 'timeless classics' fail to create an individuality, provenance or connection with the possessor, how can an artefact be both enduring aesthetically and have an emotive call for custodianship to repair or reappropriate, when an equally 'classic' design is also available to the consumer?¹² Essentially one 'timeless' piece can be easily replaced by another equally 'timeless' if the product doesn't age well, is difficult or costly to repair (relative to new), or consumers simply desire an 'updated' look (Garvey 2013). This indicates that 'classic' modernist design fails to address the phenomena of psychological obsolescence.

¹² This is particularly evident in places like Australia where low-cost replicas of 'classic' and iconic furniture are available and with the advent of low-cost Scandinavian modernist style within the IKEA offering.

The belief that Western aesthetics in practice and theory have been too heavily focused on functionality and the ocular-centric, at the expense of the role of memory and sentiment, personal interpretation, as well as human bodily and sensory response, has been debated for decades (Bachelard 1994; Malnar and Vodvarka 2004; Pallasmaa 2012).

Subsequent movements addressing emotion and changing social interpretation emerged, yet also failed to create enduring connection. Jackson, speaking on Postmodernism said:

The values associated with the object are determined by the position from which the object is viewed and aesthetic appeal is regarded, not as a universal value, outside of history, but rather as an ever-changing quality relative to the circumstance within which the object is consumed (2009, quoted in Parsons 2009, 11).

While this may be true, it gave designers scope for completely unbound opportunities, with an emphasis on the temporality of designed artefacts, resulting in greater consumer choice and consumption.

So, although the aesthetic dimension of *timeless* or *classic* design may not aesthetically date quickly, as Schiermer argues, if the objects fail to create a person-object relationship that encourages custodianship, it can be easily replaced with another equally simple, 'timeless' object. As design theorist van Hinte states: "(t)he condition for longevity is enclosed, though, in the very observation that style doesn't matter" (2004, 187-189).

2.2 CONTEMPORARY ENDURING DESIGN APPROACHES

Industrial design theory is relatively young (Cross 1982). It is focused less on sustainable consumption and more on responding to human factors (Karwowski 2011) and consumer behaviour, in order to provide 'better', more functional or more commercially successful objects (Hemetsberger 2014; Lidwell, Butler, and Holden 2003; Pedeliento, Andreini, Bergamaschi, and Salo 2016; Teichmann, Scholl-Grissemann, and Stokburger-Sauer 2016; Thomson, MacInnis, and Park 2005).

Additionally, person-object attachment theory is mainly explored through consumer behaviour studies. Despite the various movements that emerged over the twentieth and twenty-first centuries, artefact endurance as it relates to volatile personal meaning through the person-object relationship is still an emerging field.¹³

Some design researchers have, however, argued for a better understanding of our relationship to products and psychological, social and higher-level needs for extended artefact life and personal well-being (Fuad-Luke 2009, 113; Walker 2014, 91).¹⁴ Although some authors have examined object attachment (Chapman 2005, 2010; van Nes 2006; 2010; Ramirez, Ko, and Ward 2011; Woolley 2003) and personalisation (Chapman 2005; Fuad-Luke 2009, 95-102) as a way of diminishing pervasive disposability of consumer goods, there is a lack of research specifically for built environment artefacts.

Longitudinal studies on product attachment describe the active and evolving emotional bond to ordinary products used daily. Some studies highlight pleasure (Richins 1994; Schifferstein, Mugge, and Hekkert 2004) and "superior functionality, aesthetic pleasure... or [pleasurable] benefits such as entertainment or relaxation" (Mugge, Schifferstein, and Schoormans 2006, 641), and "reflect, reveal, contemplate, flow and being" (Strauss and Fuad-Luke 2008, 458) as key components to designing for long-term product attachment. Emotional endurance has been examined by Jonathon Chapman (2005) and Tim Cooper (2010a; 2010b). However, these theorists conceptualise all designed artefacts together as 'products' despite the significantly differing factors

¹³ User experience (UX) research however is interested in the person-object relationship, consumption experiences, and how these may inform professionals' approach to designing objects for richer meaning and experience (Wendt 2015). However, many UX solutions are not applicable to non-electronic built environment objects or minimising premature disposal.

affecting artefact longevity between products and the built environment, such as technological features and compatibility requirements, and the pace of lifestyle change.

These theorist’s views and approaches have been recorded, synthesised and discussed extensively by the discipline. A summary is captured in Fuad-Luke’s diagram ‘Strategies for extending product:user relations’ (2010, 617). However, here it is adapted to demonstrate the synthesis with more recent findings made by Mugge, Schoormans, and Schifferstein (2005), Cooper (2010a), Chapman (2005, 2010), Chandler and Schwarz (2010), Bennett (2001; 2009; 2010), and Walker (2014), which are incorporated into the chart. In addition, my own synthesis and understanding drawn from the existing knowledge is shown in bold in Figure 2-1. I will later refer to and update this chart in the concluding chapter (Figure 7-1) to explicitly articulate my contribution to design through design anthropology and the creative production process.

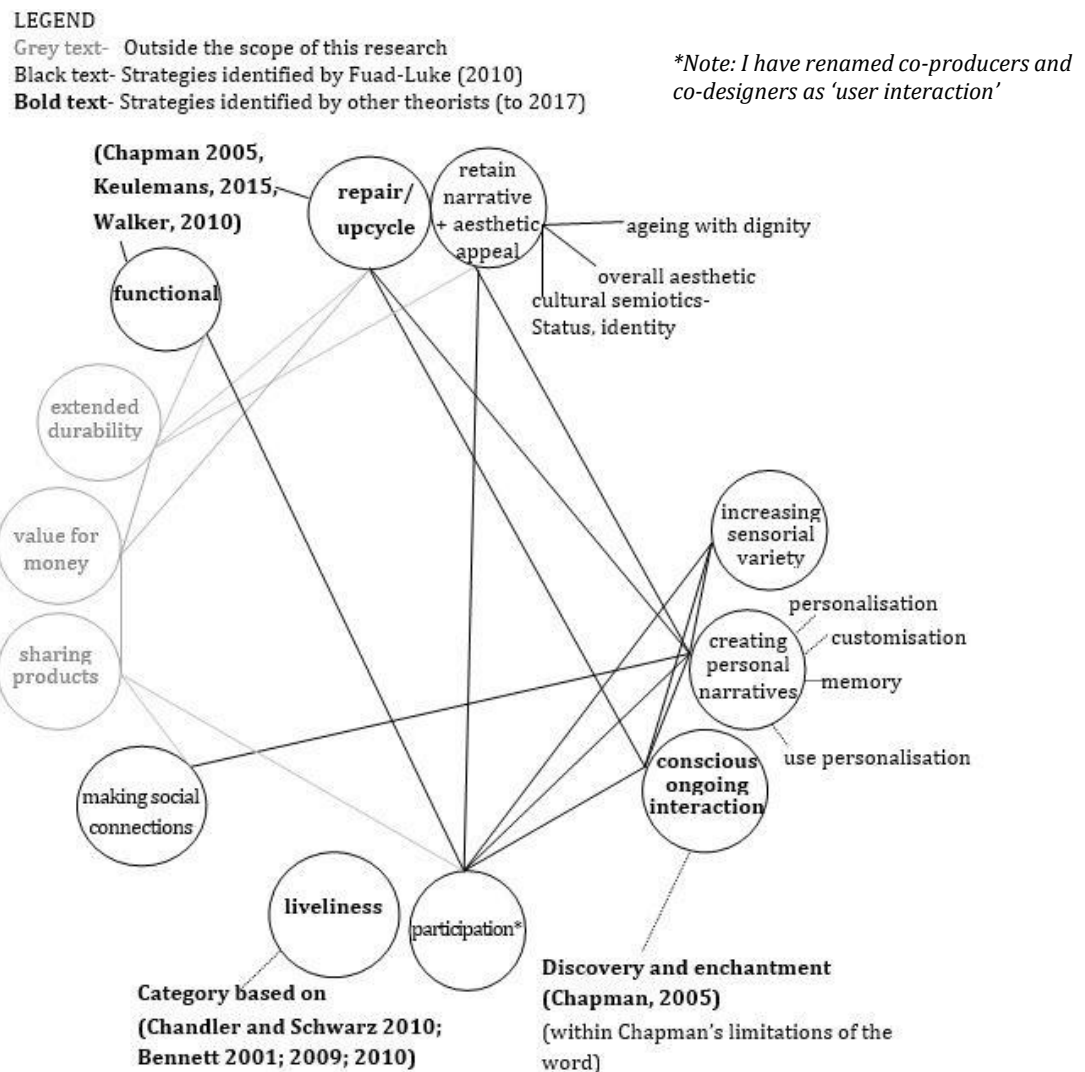


Figure 2-1. Updated chart of ‘Strategies for Extending Product-user Relationships’, Forlano, 2017. Adapted from Fuad-Luke (2010, 617).

2.3 AN ALTERNATIVE APPROACH

My research also differs from the aforementioned in the following ways. Walker (2002; 2006; 2010; 2011b), Chapman (2005) and van Hinte (1997; 2004) fail to differentiate the experiential differences of furniture and the built environment which can functionally span generations, compared to the inherently rapid change in functionality and technological requirements of electronic goods, which can become outdated within weeks.

When Walker does discuss furniture, as in his design 'Kind-of-Blue Chair' (Walker 2006b, 84), he fails to define the distinctly differing principles that underpin the creation of the inherently temporal, electronic products with the inherently more enduring and stable functions of furniture and architectural elements.¹⁵ Furthermore, Walker framed this understanding of enduring functionality by referring to and classifying objects in museum collections (2006a), in his rationale for endurance, rather than examining enduring objects in use.

Ed van Hinte cites two reasons for the current lack of enduring objects in the marketplace. Firstly, the lack of recognition by designers that products have a daily life different than the one they design for, that products are "simply there... as anonymous and trustworthy mediators, user extensions or... part of the cluster of things... but... they don't really matter that much one by one" (van Hinte 2004, 75). However, anthropological research indicates that our everyday objects can and do often matter significantly when connected to memory, kin or emotion, as I will discuss further in Chapter 5.

Secondly, van Hinte suggests designers are fascinated by the immediate impact of the product to create a desirable object at point of sale and/or communicate an idea, though "material quality, image and representation" (Ibid., 73) hence ignoring the material quality of the object after extended use. Although I agree in part, through my research I reveal some furniture designers that do consider material quality after extensive use.

The making of the object as heirloom, and the consumer as custodian, are commonly viewed as outside the domain of the designer's control, as they occur post-acquisition

¹⁵ The functionality of electronic objects is subject to rapid technological advancements, thus is viewed as being functionally unstable, as compared to furniture which is more functionally stable. Furniture is more functionally stable because people's need to sit, lie down, store possessions or place items on surfaces have changed relatively little over the last two centuries.

through the experience of consumption (Ibid., 79). Van Hinte states “In practice it is doubtful whether this ‘emotional bond’ makes much sense, since truly ‘emotional’ relationships between users and objects are rare and hardly subject to design” (2004, 79-81). Furthermore, Verbeek states the difficulty in designing for “irreplaceab[ility] thanks to the memories that will grow up around it... [through] the interactions that people have with [artefacts]” (2005, 224).

Conversely, Cherrier, Türe, and Özçağlar-Toulouse “...consider dispossession... a shared responsibility whereby both objects and humans are participants... consumers and consumed objects are part of the same dispossession story” (2014, 103). Similarly, Wendt argues that an artefact’s materiality influences human behaviour and interpretation, and therefore the ongoing artefact experience should be a consideration for designers (2015, 119).

I share Cherrier, Türe, and Özçağlar-Toulouse. and Wendt’s sentiments. The custodian imbues an artefact with an enduring status, and the enduring artefact evokes care and empathy from the consumer, who acts as a custodian in partnership, and this can be considered in the design process.

My position challenges the view that an emotional bond and/or interaction is not a design issue. I achieve this through a methodology I describe in the next chapter and the framework I generate thereafter. Designers may not enable the full control of the person-object bond but can facilitate the potential emotional and relational role of the object and the custodian-heirloom relationship, as I argue in Chapters 4 and 5.

CHAPTER 3 METHODOLOGY

3.1 THEORETICAL PERSPECTIVE

A Design Anthropology approach with a post-phenomenological perspective allows me to address objects in use. Beyond the dominant semiotic approach of design analysis (Barthes c1972/1993; Baudrillard 1968; Krippendorff 2004; Krippendorff and Butter 1984; Noth 1990; Vihma 1995), I follow the design position proposed by Attfield (2000) and Fournier and Mick (1999), which resembles a material culture approach and enables me to discover new knowledge. This perspective incorporates the artefacts' shaping of action, and changing person-object relationships over time, to provide a comprehensive response to designing for emotional endurance.

I employ a multi-disciplinary approach — design and anthropology — as this enables me to address the complex and intertwined nature of the object and subject over time, and reflect on the entire process of design, production and consumption.

Verbeek (2005) makes a cohesive argument for a post-phenomenological analysis of artefacts, that incorporates theories on the networked relationship of humans and things by Latour (2005) and to a lesser extent Gell (1998). Verbeek's approach in a global, digital age that captures hybrid, networked relationships between things, people and the world, is a thorough and appropriate framework with which to approach my research questions textually (see Figure 3-1).

Verbeek explains his theoretical perspective to enduring design, especially how it facilitates “designers to approach human habits concerning product disposal as something wherein the products themselves play an active—and therefore changeable—role... [and may] inscribe in products an ‘anti-disposal ethics’” (2005, 218).

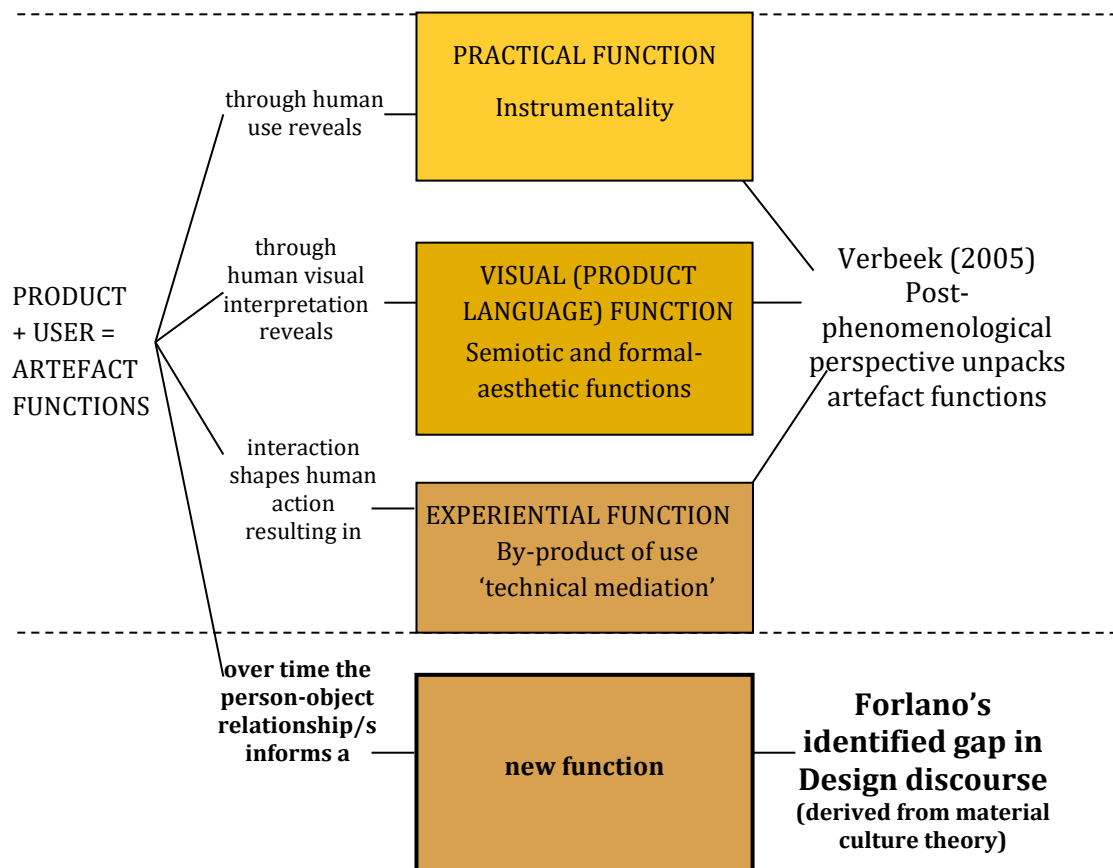


Figure 3-1. Artefact Functions diagram. Forlano, 2017. Adapted from Verbeek (2005, 206).

Material culture researchers argue that semiotic analysis (Bush 1989; Noth 1990; Vihma 1995) considers the object's visual function but fails to fully consider its materiality or 'bundling' (Keane 2003). Bundling is the combination of bundled qualities of an artefact that "will shift in relative value, utility and relevance across contexts" (Ibid., 414) including place and time.

From this perspective, the artefact is not seen simply as the inferred agency of the object over the subject, the subject over the object, nor a hybridity, but instead as an evolving relationship with potentially several subjects and objects. The post-phenomenological perspective combines actor-network theory with phenomenology to provide a richer analysis of this co-shaping (Verbeek 2005, 148). I consider this synchronous relationship, that is, the heirloom object shapes the person to be a custodian, and the custodian perceives the object to be an heirloom (Forlano 2015). I term this as the 'custodian-heirloom relationship'.

My research expands upon Verbeek's perspective, generating a fourth category that captures the changing meaning and person-object relationship over time, by incorporating the views of Gell (1998), Csikszentmihalyi and Rochberg-Halton (1981), Belk (1988; 1990; 1998; 2006), and Miller (2006; 2010). The understanding of how

artefacts are imbued with a social life, which is so strongly asserted by anthropologists, is not adequately captured as a way to analyse artefacts within design discourse. However, Verbeek's perspective provides an entry point into this understanding of enduring artefacts, as I will later show.

The artefact's instrumental, visual and experiential function is based on Verbeek's post-phenomenological perspective. The additional category I propose emerges from material culture research, as it encapsulates the shift over contexts and through time via experience with the artefact, which is considered a critical aspect of gaining a comprehensive understanding of the person-object relationship (see Figure 3-1).

3.2 RESEARCH METHODOLOGY AND METHODS

My practice-led doctoral research in the emerging field of Design Anthropology uses an action research methodology. The action research process incorporates practice and theory, synthesised to generate theoretical knowledge that guides action (Given 2008, 6) to reveal new knowledge. There are three distinct processes: the exegetical research and methods, creative production, and the synthesis of these, which inform the activities, findings and reflections in three stage cycles, as shown in Figure 3-2.

3.2.1 LITERATURE REVIEW

The first process is the literature review, identified as part of the first action research cycle in Figure 3-2, covering the historical and contemporary context of escalating mass-consumerism, sustainability, and the role of the design and manufacturing industry and existing design approaches towards enduring artefacts. I found that there is not a comprehensive study of artefact's emotional endurance with a Design Anthropology approach, as discussed in Chapter 2.

I examine the psychological and social influences on artefact life span, including factors affecting perceived obsolescence, and conversely the processes of reappropriation that save artefacts from the waste stream, through literature review from books, academic journals and some newspaper articles. My exegesis reviews literature in social anthropology, material culture and consumer behaviour research, including seminal texts from the last century, but focuses on recent research from this century. I then determine the most suitable theoretical perspective and approach to responding to the research questions. This process evolved during the second action research cycle to provide a deeper understanding of the topic.

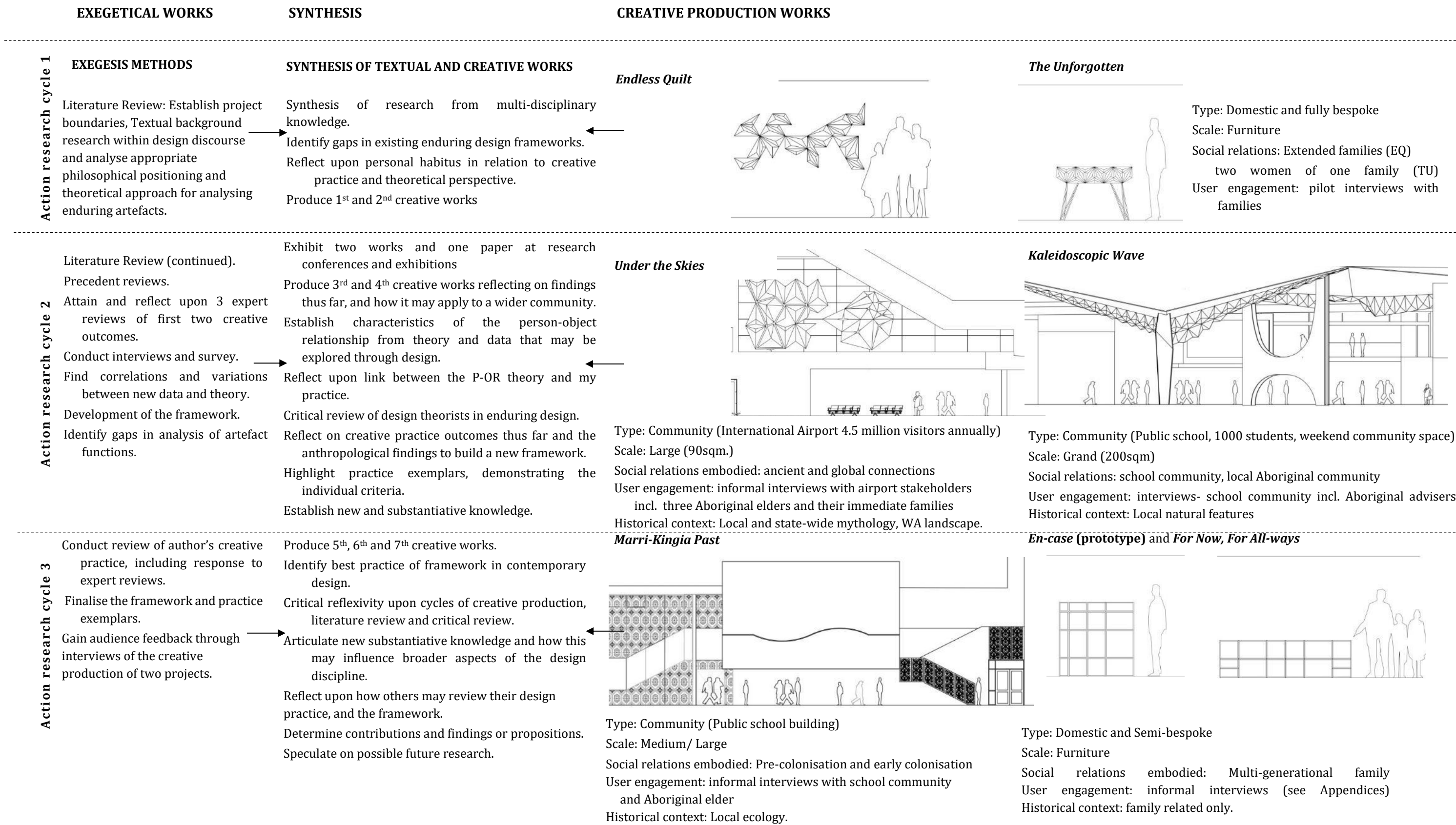


Figure 3-2. Action Research Process and Methods. Forlano, 2017.

3.2.2 INTERVIEWS WITH STAKEHOLDERS

The development of the furniture projects involved interviews and informal discussions with end users and family members about significant places, events, persons or memories. The discussions focussed upon an anthropological understanding of the end users, by discussing significant life events that have shaped their family attitudes and values, in particular those life stories that they want future generations to know and remember. I asked general, open-ended questions about these life experiences and asked which were imbued with enduring and or positive emotions or qualities that define their family identity and thus create intergenerational connection and relevance. These interview questions were based upon my synthesis of the common emotionally enduring qualities of heirlooms (or artefacts of attachment), and thereby enabling me to explore how the experiences may be embedded in the design process to encourage attachment.

For example, in the first project, *Endless Quilt*, I spoke to my family and in-law family (7 adults) and re-read my husband's maternal grandfather's published diary "Ground Crew: A Middle East Diary". The stories that re-appeared in various people's perspective of themselves and their family's life story were deemed most significant as the experiences permeate various generations and hence create the kinship identity. In particular the impact of five individuals across two generations and two wars, and how these events brought three couples together was particularly defining of my in-law family and is thus featured in the work. However, their stoic response to these events and their focus upon the positive outcomes such as marriage and children, and their desire for a 'quiet' life, is also thus captured as this is the message they wanted to pass on to others, in lieu of for example, the negative memories of war.

I also reflected upon my personal memory. By putting myself in the position of both client and designer, I was able to most freely explore and test ideas and develop the process and topics when interviewing stakeholders. I recalled memories of my grandparents' stories that I would like my children to know, particularly as many of these stories are by deceased relatives and I sought corroboration of these stories. These memories, not only evoke what is emotionally enduring and identity making for myself, but these were strong, influential characters within the wider family narrative. In this process of recalling my own memories, I realised this was an opportunity for their memory and stories to become a tangible and highly visual element within the artefact. This would enable the artefact to can act as an heirloom, despite its newness, through

which I can talk about the past with my children.

In the case of the second project, *The Unforgotten*, a visual documentation of historical artefacts was used and integrated into the design (see Figure 6-20 and Figure 6-21) with a one-on-one in-depth unstructured interview with the owner. The interview was approximately one hour, and details about the artefacts, such as how they came into possession of the owner, where they were acquired, who made them, for what purpose and any other stories behind each artefact were discussed. In contrast to the *Endless Quilt* interviews and memory recollection, which was typically intangible, *The Unforgotten* interviews were based around existing tangible things; heirlooms themselves.

The subsequent three community projects involved informal discussions with end users, stakeholders, and Aboriginal elders or representatives of their community. The Perth Airport project, *From the Skies* included five meetings with Aboriginal representatives and the Perth Airport Aboriginal liaison staff. I also conducted several informal open-ended discussions with a Whudjuk/ Piblemnan/ Nyungah Aboriginal elder who contributed the wording for the artwork. Key to any discussion with Aboriginal communities is taking the time to listen to their stories. Although the discussions were based on the artwork per se, considerable discussion was about my personal story, my ethnicity, why I was doing the project, why I wanted to include Aboriginal content and what I hoped to achieve. Upon agreeing to my intentions, the discussion then lead to the Aboriginal elders telling their family, kinship and wider Aboriginal stories about their past, their struggles, their beliefs. This is an important process of understanding the wider context in any discussion with Aboriginality.

Discussions were held for end users for Kaleidoscopic Wave at Fremantle College which included approximately 20, Year Ten students, a mix from the two schools to be amalgamated, 5 teaching staff and other government stakeholders. The discussions were focussed on the purpose, meaning and impact of the school amalgamation and commonalities in identity of the schools, community and the traditional Aboriginal owners to create a meaningful outcome that crosses various communities and maintains relevance to future generations.

Open discussions for the Byford project was conducted with the stakeholders over several months including a meeting with the advising Aboriginal elder for the Byford area. Research of the environmental conditions of the location from pre-colonial times

was conducted to tap into a history that I determined had been ignored in the development and the existing artworks found on the site. By recalling a pre-colonial history, I aimed to contribute to the existing narrative that had commenced with other artworks on site.

Historical research for all the sites was conducted online, through site visits, and community and governmental organisations.

The interviews and feedback were recorded for the final projects *For Now, For All-ways* and *En-case*. This is included in Appendix A for reference. The interviews became a refined version of those held for *Endless Quilt*. The interview questions were given to the interviewees allowing them to reflect on the questions, and a subsequent face-to-face discussion held later. As the literature research was mostly analysed by this stage, the questions were based on my findings on attachment artefacts.

3.2.3 SURVEY

I conducted an online survey via *Survey Monkey* through a snowballing method, recruiting participants through personal emails and three social media posts (LinkedIn, Facebook Design Group and Facebook personal page). This intentionally limited the network to predominantly Australian-based art/design practitioners and laypeople, to ascertain any significant variances within the contemporary Australian context and since the reviewed publications.

The survey enables a comparison between design (and art) practitioners and their audience. Age categories include from 18-34 years, 35-54, 55-64, 65-74 and 75 and above. There are 83 responses in total, with 23% from males and 77% from females.

The survey includes multiple choice and open-ended questions, some based on survey questions from *The Meaning of Things* (Csikszentmihalyi and Rochberg-Halton 1981) for a direct comparison, while other questions are more specifically related to furniture acquisition, disposal and gifting, to establish relevance and currency.

Questions uncover respondents' attitudes toward artefact life spans such as: What type of artefacts do they own which they consider to be received as heirlooms or would be

bequeathed to others in the future and why? What do they think are the qualities of heirlooms and life expectancy of furniture generally? Other questions specifically pertain to furniture artefacts and purchasing behaviour, the second-hand, disposal and repair or renewal. A summary is in Appendix C.

My survey focuses on built environment artefacts as compared to the theory based on products more generally. This provides the opportunity to support or challenge existing findings and uncover new information pertaining to built environment artefacts specifically, and reflect upon consumers' attitudes, practice and the Enduring Design Framework. Survey findings and responses are discussed in the context of theory and practice.

My survey focused mainly on enduring and common attitudes. It gave little consideration to the informant's age or other specifically differentiating characteristics for the following reasons:

- i) Artefacts are often physically durable beyond the initial owner's needs and across significant periods of time, so to understand artefacts' emotional endurance, my methods focus on the commonalities across life stages and age.
- ii) Marketing and design specifically for segmented age groups or lifestyles limits transferability and contributes to premature disposal.
- iii) Age and perceived activity and lifestyle stages in contemporary Western society are increasingly blurred compared to earlier decades, and thus designing for specific age groups is questionable.
- iv) Any further differentiation is outside the scope of research of this size.

Despite conducting this survey, the purpose of my doctoral research was not to focus on what already exists through ethnographic study or audience responses to my work. Rather it was to use this knowledge to inform and expand upon theory. It inspired me to speculate through practice and theory on *what can be*, while being grounded in the practices and attitudes of contemporary consumers. The survey was formulated after most of the relevant literature had been reviewed. The main aim of the survey was to identify any significant discrepancies and/or correlations between theory of the last two decades and current day respondents, to ensure currency of the background literature, and as a tool to assist in my reflection upon built environment design practice and theory.

3.2.4 INTERVIEWS

Semi-structured in-depth interviews were incorporated to identify custodial attributes first hand and contextualise current day attitudes with seminal texts on the topic. Two conversational interviews were conducted with adults who identify as being 'custodians.' One lasted thirty minutes, the other two hours. Both were at the interviewee's homes. The first interviewee, Louise,¹⁶ is a female, single mother with three dependents, living on a low income. The other interviewee, Fred, is a married male, where both partners are working professionals and they have two dependents. Through informal discussions about my studies, I learnt of these two people's passion for collecting other people's unwanted artefacts, and they were therefore approached and agreed to participate in the study. Appendix B includes the interview schedule.

The interview schedule was based on the findings from anthropological theory and the survey conducted to gather more in-depth details of the themes and information content already collected. The interviews provide rich, qualitative information pertaining to retention, care and collection of artefacts. By directly asking questions of individuals that related to the enduring person-object relationship identified in the literature and the surveys, I gained greater depth of insight into the person-object relationship on a personal level not possible with a survey. This format also enables the interviewee, in this case two individuals, one of each gender, to reveal personal information and perspectives in a safe and anonymous manner not possible in a focus group (DiCiccio-Bloom and Crabtree 2006, 314). These interviews aimed to gather more in-depth perspective of the details of the themes and information content attained and allowed me to probe areas of interest more deeply and to then compare it to the existing literature, giving it currency and context to this study and period in time.

As Galvin argues, 12 interviews are sufficient to reach 'saturation' point for qualitative research that uses interview data to make inferences that are implied to a wider population (2015, 9-10). Considering the stakeholder pre-design and post-design interviews and survey is collectively reviewed with these interviews, the entire data collection was deemed an appropriate cross section of population engagement within the scope of this creative production-based research thesis.

Questions were aimed at discussing their 'special' or 'heirloom' items, custodial practices and attitudes, and their emotional response to and experience with artefacts. I also discussed their perceived differences between themselves and consumers who use up and discard in a much faster cycle.

¹⁶ Alias names are used throughout to maintain confidentiality.

3.2.5 PROPOSITIONAL DOMESTIC ARTEFACTS

The creative production process embodies the Enduring Design Framework, challenges my design thinking, and creates *propositional artefacts*. Propositional artefacts enable the exploration of theories through design and physical manifestation and are considered as progressing sustainable design practice and thinking (Fuad-Luke 2009, 85; Walker 2013).

My creative production methodology took on the guise of ‘design activism’ in a practical and theoretical sense, as it is explorative and responds to the challenges of my research questions in a practical, rather than a purely confrontational manner. ‘Moral panics,’ characteristic of critical design artefacts, are believed to be ineffectual and cause disillusion in the audience (Miller 2010, 82; O’Neill, Boykoff, Niemeyer, and Day 2013), often leading to apathy or greater hedonism (Acaroglu 2014). Thus, critical artefacts were deemed to be an inappropriate response to the research question. The propositional and commissioned artefacts demonstrate *real-life* outcomes of how the Enduring Design Framework can be carried out materially, while simultaneously exploring opportunities for the design of enduring artefacts from a more intuitive design position.

As each creative work and research cycle was undertaken, new considerations were given to the subsequent creative project type, process, theory, and outcomes.¹⁷ Each project came to represent a shift in the exploration of yet other facets of enduring design, rather than a linear evolution of one idea or application. The propositional domestic artefacts in this process included four furniture scaled, individual or family bespoke/semi-bespoke propositional artefacts. Two works were private commissions, while two were self-funded, so that the research enabled free exploration untied to budgetary restraints.

¹⁷ The exegetical sequencing of information contained herein however, does not reflect the sequence of the iterative action research cycle.

3.2.6 COMMISSIONED COMMUNITY ARTEFACTS

As the research evolved, I determined the significance of the research could be broadened to include larger, building scaled applications. I secured three large public art commissions as ‘integrated’ architectural works. This allowed me to test how the emerging framework may be applied within a public rather than private context, to connect with a wide and ever-changing audience and at a scale that can’t be physically controlled by individuals.

My project, *From the Skies*, for the international arrival hall at Perth Airport, provides an example. The arrival hall is visited by up to 4.5 million people a year and is situated on a wall, well above head height. It is physically distant from the public and thereby provides challenges to create a mental and/or emotional engagement.

All three commissioned projects were competitively tendered and commissioned works, demonstrating application of the findings to commercial practice with real-life constraints.

3.2.7 EXTERNAL EXPERT CRITIQUES

Upon completion of the first two creative projects, *Endless Quilt* and *The Unforgotten*, I requested critical reviews from three experts to assist in broadening my personal reflection upon my practice in relation to designing for custodianship. The experts included a furniture and product designer and academic with a Doctorate in a similar field of study; a senior curator from a major arts and science museum with experience as an independent curator internationally with a Master of Curating Contemporary Design, and a prominent arts and craft researcher, arts advocate for national and international non-government and government organisations with a Master of Arts Administration. Thorough feedback was received, reiterating concerns I raise that underpin the reason for this research and reinforcing much of my design direction. Their full reviews are contained within Appendix G, but they are not directly discussed within this exegesis.

Endless Quilt and *The Unforgotten* were also exhibited at FORM Gallery, Perth, Australia, for the ‘A State of Becoming’ symposium and its associated creative production as research exhibition (2012) and the ‘From the Atelier’ (2013) exhibition respectively. Further, I presented a paper based on the *Endless Quilt* at the ‘Unmaking Waste 2015’ conference in Adelaide, Australia. These opportunities generated further informal

critique of the works for my personal reflection from design practitioners, researchers and academics.

3.2.8 PRECEDENT REVIEWS

Throughout the research process I examined designed artefacts by national and international designers that reflected anthropological concepts regarding enduring person-object relationships. Through this process, I reveal contemporary exemplars that best demonstrate the principles of the Enduring Design Framework.

3.2.9 SYNTHESIS

Through the action research processes, I synthesise the findings from the cycles, (Figure 3-2, centre) through creative production, literature review and critical review. I create an Enduring Design Framework through an action research process, grounded in design and anthropological theory, participant interviews, user feedback and through design practice. I also reflect upon the intuitive drivers of and critical review of my creative outcomes and those of other design practitioners.

The Enduring Design Framework presents a set of considerations for the designer that can build an enduring person-object relationship with artefacts of the built environment, largely with a furniture focus, and identifies best practice. It also refers to my own creative works where gaps in practice were found, as examples of how the principles may manifest.

CHAPTER 4 THE NON-DESIGN PERSPECTIVE: REVEALING GAPS IN PRACTICE

Chapter 2 has provided a contextual review of design discourse on enduring design. I will now explore the non-design perspective. This draws on anthropology, material culture, contemporary consumer behaviour, consumer psychology, and philosophy of technology, as it pertains specifically to enduring built environment artefacts and the person-object relationship over time. These insights and their application are under-explored in design discourse and practice. I take a Design Anthropology approach and an action research process to examine both theory and practice to develop an Enduring Design Framework and a series of artefacts (Figure 4-1).

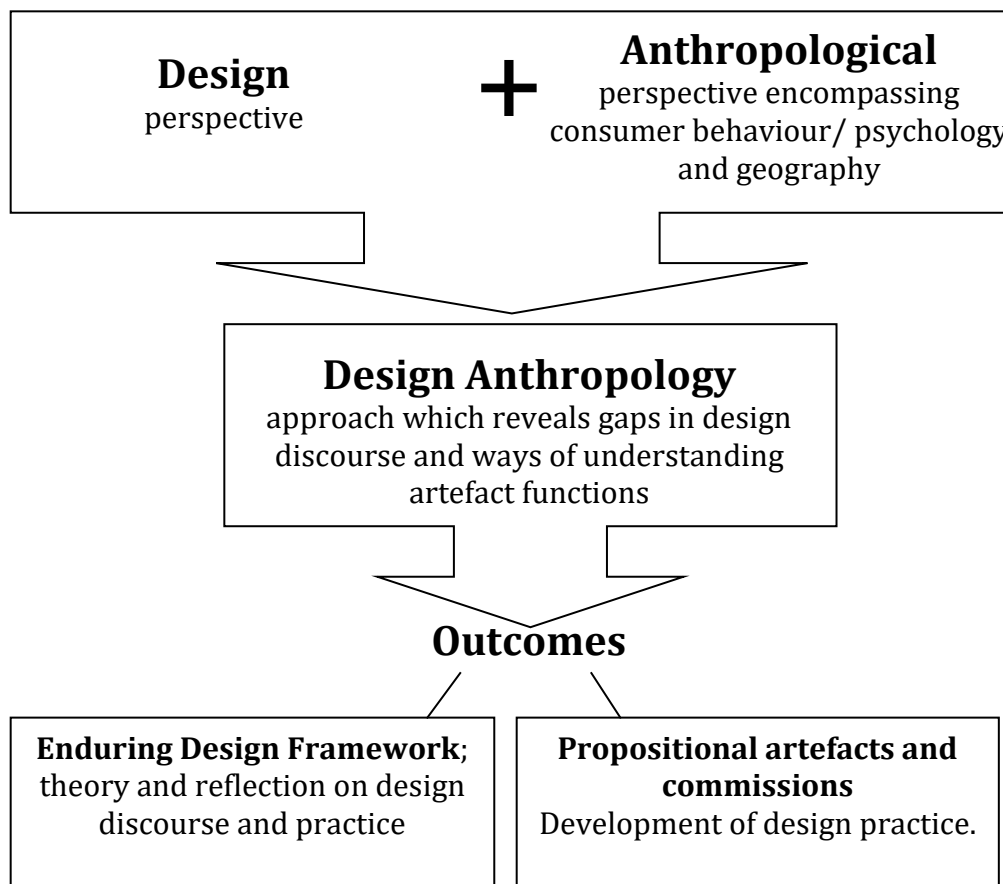


Figure 4-1. Research approach, diagram. Forlano, 2017.

My focus is people’s long-term relationship to things, and the implications this has for design generally, but also specifically on designing to encourage custodianship practices.

Firstly, I ask “are there enduring needs that can be fulfilled by designing built

environment artefacts?” Materiality, as Miller asserts, also provides a physical connection to immaterial values or the spiritual dimension (Miller 2010, 72). I shed light on this concept with reference to Abraham Maslow’s theory *Hierarchy of Needs* (1943).

While in the previous chapter I discussed the design context generally, I now discuss forms of obsolescence and fast consumption, and the inverse position of custodianship and attachment artefacts. In association, I unpack the person-object relationship and reveal how artefacts become precious, enduring, build continuity, and contribute to an understanding of the self. I argue that enduring artefacts can assist in developing positive associations and contribute to a long-term, ongoing psychological need that serves to support the development of self as defined by Maslow’s theory.

Using literature reviews and data collection and analysis, I elaborate upon the missing but vital component of enduring artefacts currently ignored by most design theorists yet acknowledged by many cultural anthropologists. This emotive component is a by-product of an artefact’s use over time. This ongoing emotional, cognitive and sensorial engagement with artefacts creates the perception of a direct connection to something greater, be it an event, person, place or time. The artefact then performs a vital role as both a conduit and as evidence of that connection.

4.1 FAST CONSUMPTION VS CUSTODIANSHIP

Cultural anthropologists and social psychologists have identified consumption as having both positive and negative traits. Positive associations include: identity creation; community belonging (Ahuvia 2005; Belk 1988, Belk and Tian 2011); the want of a ‘better life’ (Shove et al. 2007); enhancing the social, emotional and physical experience (Douglas and Isherwood 1979/2002; Fournier 1991; Gell 1998); and existential meaning making (Elliott 1997; Smith 2007). Conversely, among other negative traits (Miller 2006; Whybrow 2005), consumption is also associated with: superficial materialism (Fromm 1976); indifference, undermining of health and personal well-being (Kasser 2003; Whybrow 2009, 112); and alienation (Bourdieu 1984).

Changing over time, objects gain complicated and layered meanings (Appadurai 1986; Belk 2006; Csikszentmihalyi and Rochberg-Halton 1981; Gregson and Crewe 2003; Jung et al. 2011; Kopytoff 1986; Tilley 2006). Over time objects become highly contextual, subjective, and their meaning unforeseeable (Gregson and Crewe 2003, 142). As objects partake in social meaning making, individual relations with objects become difficult to anticipate not only for one person, but more so for future generations. Unanticipated

meaning and events can re-shape attitudes towards artefacts, which the designer is not in control of, potentially rendering some functioning objects as 'junk.'¹⁸

Reasons for premature disposal include *psychological obsolescence*¹⁹ (which also encompasses *lifestyle obsolescence*) and waste justification through *replacement morality*.

Firstly, psychological obsolescence is when an artefact is no longer part of the self-concept and desirability is lost, or when an item is viewed as technically obsolete due to the desire for greater innovation or features available in other similar artefacts (van Nes 2010, 120). Lifestyle obsolescence includes when one's change in lifestyle renders an artefact obsolete, such as when a child outgrows a cot, and the artefact is disposed of due to a lack of reappropriation by others (Cherrier 2014, 107). Hebrok's (2014) term of 'dis-domestication' explains this phasing out process and dispossession of furniture, specifically in her article *Design for Longevity*. Both Hebrok (2014) and Miller (2010, 97) note that events such as moving house allow one to reconstruct and curate their biography through furniture. Conversely, some objects, including furniture, are specifically reappropriated to emotionally help in dealing with the loss of significant others (Miller 2010, 147), thus demonstrating the positive role of retaining objects as a conduit to a social other. In these circumstances, the person-object relationship defines the status of artefacts, not the artefact's functionality.

Secondly, *replacement morality* includes four identified ways in which a consumer justifies the disposal or offloading of an artefact: by feeling that the artefact's role has been fulfilled for the price paid; by the fear of emerging defects; by the feeling that they deserve the 'new' as a form of reward; and by the belief that the artefact will be kept in use or stored in some way for future use (van Nes 2010, 116).

As discussed in Chapter 2, the pervasive understanding of 'timeless' and 'classic' design, particularly within the design industries, has long been presumed to be the antithesis of built-in psychological obsolescence. 'Classic' and 'timeless' designs are defined as ground-breaking leaders or possessing the spirit of their time (Feill and Feill 1991, 7),

¹⁸ The Environmental Protection Authority in the USA states that in one year, 8,550,000 tons of furniture and furnishings are dumped. In *Waste and Want a Social History of Trash*. "The United States consumed 46 percent more materials on a per capita basis in the year 2000 than in 1975" (EPA 2015, 3)

¹⁹ Also referred to as obsolescence of desirability (Packard 1961), emotional obsolescence (Chapman 2005) and relative obsolescence (Cooper 2004).

or reflecting pure or sublime form and material honesty (Ibid., 7; Schiermer 2016) and thereby being long-lasting. Although this is in part true, replicas of design ‘classics’ have demonstrated that adhering to a set of ‘timeless’ or ‘classic’ visual design principles is problematic. If we use the analysis of artefacts set out by Verbeek (2005) the visual language, instrumental function and the experience are much the same between original classics and replicas or unverified originals. Yet replicas can be perceived to be just as disposable as poorly designed and/or made artefacts while originals are revered. Meanwhile, some poorly repaired, non-functioning artefacts may be retained and beloved by consumers.

It is apparent that marketing fosters the feeling that one never has enough. This sense of ‘lack’ felt by consumers drives increased consumption (Crocker 2016). When the object falls from general favour, a perceived disconnection arises, and thereby reminds one of what is missing (Botton 2004; Elliott 1997, 289; Hamilton and Denniss 2005; Kasser 2003, Naish 2008). Advertising and the design industry have significantly contributed to the rapid climb in relative obsolescence, moving their marketing push from decades, to yearly, and now ‘seasonal’ (Garvey 2013, 76), (and see Appendix E).

The survey I conducted showed only 3% of respondents agreed that “seasonal and *on trend* furniture is most important” in their consumption choices. Yet 20% of respondents agreed or were neutral when asked if they “don’t consider how long furniture lasts,” and 45% agreed that furniture is a “throwaway commodity.” In a later survey question, only 33% of people in the under-64 age group “wanted” their furniture to last more than 20 years. This indicates that seasonal trends may not be important, but 67% of consumers expect to be changing or disposing of their furniture within 20 years, and in some cases far less. In this context, “lasting” in terms of time and aesthetics, is relative, and longevity of furniture is considerably shorter than past decades.

As one respondent notes:

I try to buy classic, quality pieces so that they will last and fit into future houses etc. ... other short term purchases (e.g. nursery furniture, soft furnishings) I don't expect them to last too long. (Survey respondent #83. 18-34 year-old female, non-art/design professional)

This highlights that the design and manufacturing industry’s complicit role in reducing product durability and reinforcing the acceptance of high product churn domestically is infiltrating consumer’s attitudes.

Additionally, often component life-spans differ, resulting in the entire artefact being disposed of because costs for repair or partial replacement make buying new more economic,²⁰ particularly when full replacement cost is low. As professional and layperson repair skills diminish, repair costs thereby increase and new furniture costs have lessened relative to repair and income (Hebrok 2010), “black-boxing” makes repair difficult, and “throw-away” attitudes to furniture are on the rise.

One survey respondent notes he would throw away an artefact, because he expects no-one else to deem it worthy of repair:

[I] throw ...[furniture] away if ... it's too expensive to be repaired. (Survey respondent #55. 35-54 year-old, male, art/design professional)

However, some consumers behave as custodians or carers of artefacts, reviving, renewing or reappropriating artefacts in a new context. As ‘Fred’, the male interviewee remarks in relation to a meat safe that he saved from destruction over 30 years ago, and restored and still uses to this day in his kitchen:

Fred: “See this [points to timber meat-safe] I found it at a house that was getting vandalised at Narrogin. I used to go past on my way to school. The top was off and it was all falling apart. Dad knew the old farmer family that owned the house, and rang them up and I just asked if I could grab it.... (2016)

Attachment refers to the level of emotional connection to artefacts psychologically appropriated that significantly delays disposal (Sirianni and Lastovicka 2011; Thomson, MacInnis and Park 2005) and define one’s self-concept and identity (Ahuvia 2005; Belk 1988, 2006; Csikszentmihalyi and Rochberg-Halton 1981; Heisley and Cours 2007; Kleine, Kleine III, and Allen 1995; Schultz Kleine III, and Kernan 1989; Wallendorf and Arnould 1988). Artefacts of intense attachment assist in sustaining self-concept (Ball and Tasaki 1992), and can range from expensive or low cost, sacred to secular, and public to private. Collectively these artefacts are referred to as

- loved (Ahuvia 2005; Belk 1988; Chapman 2014; Mugge Schoormans, and Schifferstein 2009; Russo, Boess and Hekkert 2011; Thomson, MacInnis and Park 2005)
- beloved (Sirianni and Lastovicka 2011)

²⁰ It is worth noting the increasing wastage of furniture’s constituent parts; “Generation of furniture and furnishings in MSW [Municipal Solid Waste] has increased from 2.2 million tons in 1960 to 11.6 million tons in 2013 (4.6 percent of total MSW). The only recovery of materials from furniture identified was mattress recovery.” (EPA 2015, 64).

- inalienable (Curasi, Price and Arnould 2004; Weiner 1992)
- sacred (Belk 1989)
- ensouled (Jung et al. 2011)
- special, cherished and precious; used interchangeably (Belk 1988; Csikszentmihalyi and Rochberg-Halton 1981; Curasi, Price and Arnould 2004; Tobin 1996).

It is these intense *attachment* descriptors for an artefact that endures which provide us with some insight into long term ownership that is characterised by *intense care* of artefacts, and the owner is deemed to have a custodial role. It is the strong emotional person-object relationship and experiences over time that create personalised meaning or *singularisation* (Epp and Price 2010; Kopytoff 1986), enabling longevity of artefacts (Karanika and Hogg 2012). Of those singularised artefacts, even fewer retain meaning across generations to become inalienable (Epp and Price 2008; McGraw, Tetlock, and Kristel 2003).

Meaning, however, is changeable, particularly as one moves through life stages, and they may transform into non-self artefacts (Kleine 1995), that are then easily discarded (Ball and Tasaki 1992; Hebrok 2010; Miller 2010).

Inalienable and the most precious attachment objects form *evidence* or trigger memories that also reinforce the self. Objects that are most emotionally tied to the self inform one's internalised self-worth, particularly when they are coupled with ongoing positive experiences and values that are deemed significant (Ball and Tasaki, 1992). Loss of attachment objects may endanger one's self-identity (Ferraro and Escalas 2010). Therefore, attachment objects are likely to be kept and cared for.

Belk's (1988, 1989, 1995, 1998, 2006, 2008, 2011) empirical and seminal research concerning collectors, custodians and consumption behaviour underpins my understanding of intense emotional attachment and meaningful, long-lasting person-object relationships. Artefacts of attachment are argued by theorists such as Belk to become part of the extended self, while other theorists such as Gell (1998) hold the reciprocal position that the self becomes a part of the object. In any case, artefacts of attachment become intertwined with the self.

Figure 4.2 summarises and collates the attachment determinants from various authors in the field (Ahuvia 2005; Ball and Tasaki 1992; Belk 1988, 2006; Kleine and Baker 2004, Mattelmäki and Battarbee 2002, Mugge, Schifferstein and Schoormans 2006; 2010; Mugge, Schoormans, and Schifferstein 2009; Savaş 2003; Schifferstein, Mugge, and

Hekkert 2004; Sirianni and Lastovicka 2011; Wallendorf and Arnould 1988), and these are grouped into broader categories for clarity. I then link these to Verbeek's (2005) 'product function' categories, with the addition of determinants associated with commerce and sales by Fuad-Luke (2010), and my additional category, which emerged from ongoing use over time.

The final category encapsulates particular determinants of attachment, such as the object's genealogy (place of origin and/or purchase, the maker and the events that singularise the artefact) which I argue are currently not adequately covered by existing design analysis categories. For example, heirloom artefacts made by a relative become significant, not because of their symbolic visual appearance (although this may be co-present), but through their story-telling capacity and the physical manifestation and evidence of the person's effort and time. The experience of the possessor or the maker is materially imbued in the artefact. This experience of telling the story of the artefact over time, or its making over time, sits outside the categories of practical function, visual product language function (because it is not purely visual but relies on other forms of communication to tell its story), and does not mediate behaviour as a by-product of functional use (Verbeek's Experiential product function). Rather, it evolves and changes over time, to function in a new way. That is, the possessor perceives the artefact to be imbued with a special, singularised meaning, and the artefact is deemed to have these evidential connections. The evidential function, the new category that I contribute to this discussion, is under-theorised in design discourse.

When reviewing the literature, it became clear that attachment determinants (far right column, Figure 4-2) such as personalisation over time through use, consumer co-production, imbued memory of places, events and people, evidence of wear, and perceived presence of an embodied soul or the spiritual, could not be adequately categorised by previously identified product functions within design discourse. Nor were the determinants adequately captured by Verbeek's notion of mediation as a by-product of experience. This is because attachment requires an individual's *ongoing* experience through the artefact, through engagement, an understanding or perception of the artefact's genealogy or uniqueness (centre column, Figure 4-2). It may give pleasure and contribute to personal well-being as do other attachment determinants. However, understanding the bonds possible over time requires a new analysis of how designers can design to encourage this type of longer term person-object relationship.

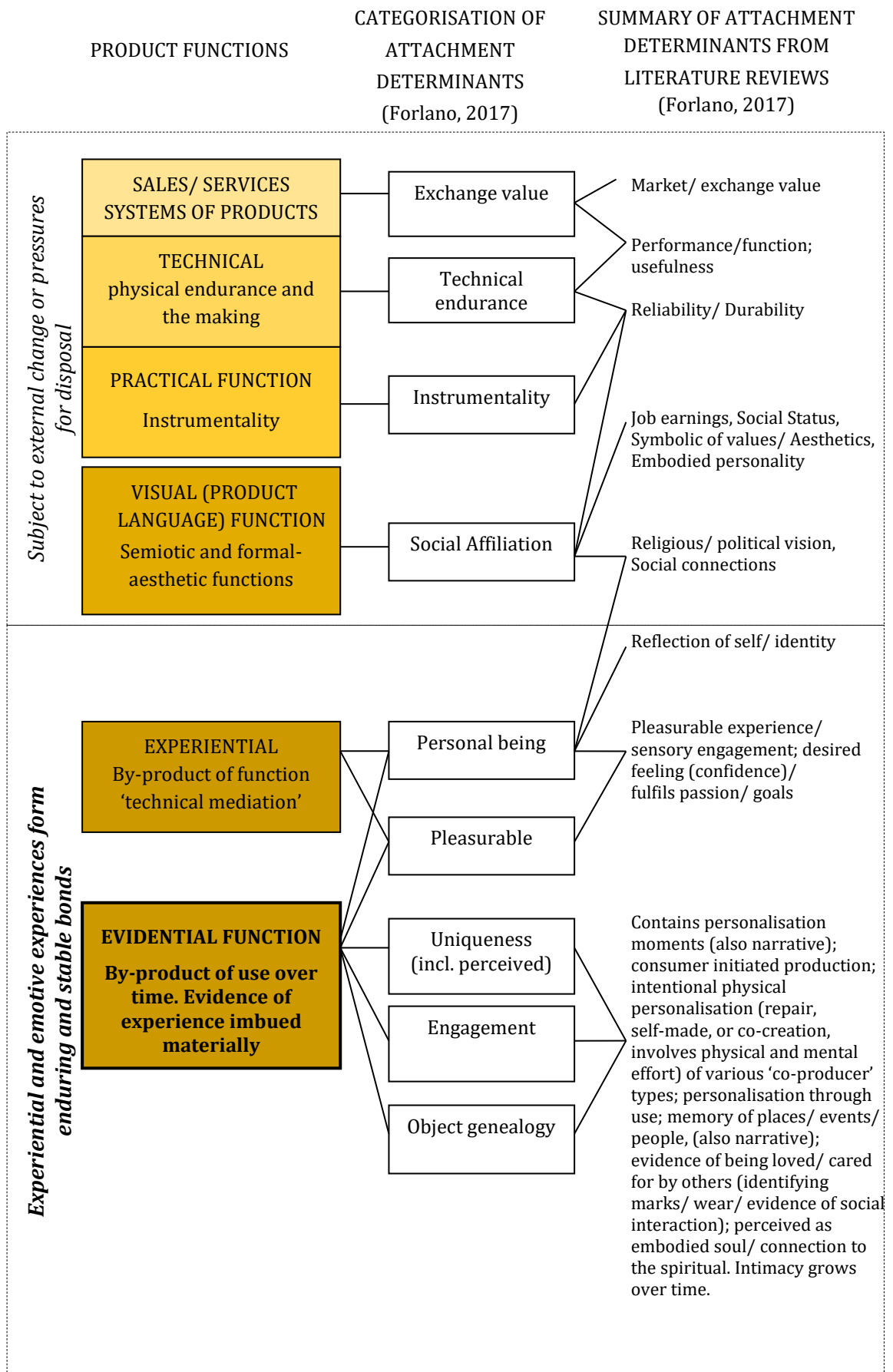


Figure 4-2. Artefact Attachment Determinants and Product Function Relationship Map, Forlano, 2017.

The chart's structure highlights that the most enduring artefacts have the qualities represented in the lower half of the figure. Artefacts with these attachment determinants are least easily replaced, and thereby potentially cared for by people acting as custodians. This custodianship role is thus distinguished by a person-object relationship that is invested with emotion over time.

As highlighted (by the top dotted outline) in Figure 4-2, attachment determinants that are based on exchange value, technical endurance, and instrumental value, are relative to other products being released into the marketplace, and are thus somewhat volatile, although exceptions may be seen in rare artefacts of extremely high exchange value, such as verified antiques or collectibles. Similarly, where attachment is based on the semiotic function of an artefact, such as symbolising status or political alliance, this can be subject to volatility of meaning or interpretation by media, social change, and perception of needs (such as size and functional needs). These attachment types are worthy of consideration for designers, but I emphasise the need to address that which is rooted in personal experience and less subject to external influences.

The experiential evokes stronger emotional and psychological attachment and is less affected by external influences such as the pressure by media for the newest or biggest. In summary, the significant attachment determinants in enduring artefacts are:

- life narrative, mnemonic of places, events or people (Csikszentmihalyi and Rochberg-Halton 1981; Cherrier 2010; Curasi, Price and Arnould 2004, 609; Kleine, Kleine III, and Allen 1995; Mugge, Schoormans, and Schifferstein 2009; Schifferstein, Mugge, and Hekkert 2004);
- evidence of being loved by another, for example, through gift giving or inheritance (Wallendorf and Arnould 1988; Csikszentmihalyi and Rochberg-Halton 1981);
- embodying a significant other (Chandler and Schwarz 2010; Gell 1998) or creating strong emotional connection to another person (Savaş 2003; Wallendorf and Arnould 1988);
- increased intimacy over time, personalised, rare or unique (Gell 1998; Jung et al. 2011; Mugge, Schoormans, and Schifferstein 2005);
- fulfilling personal life goals or passions (Jung et al. 2011; Schifferstein and Zwartkruis-Pelgrim 2008);
- consumer initiated personalisation, investment of effort or time, (Jung et al. 2011);
- to serve for contemplation of the inner self over time, an evolving relationship results in retainment (Gell 1998; Jung et al. 2011; Kleine, Kleine III, and Allen 1995);

Schifferstein and Zwartkruis-Pelgrim 2008; Schifferstein, Mugge, and Hekkert 2004).

According to Hebrok (2010) emotional determinants of attachment can guard against disposal and place us in a better position to encourage custodian-heirloom relationships. The following section focuses on understanding human needs through Maslow's theory of *Hierarchy of Needs* (1943), the existing interpretations of this as related to product design, and my alternative interpretation.

4.2 MASLOW, ARTEFACTS, AND ENDURING NEEDS

Maslow's Hierarchy of Needs has been accepted by the product design field to enable a better understanding of consumer needs. I offer an alternative view of this theory as a means to assist designers to build 'emotional endurance' into the process of artefact development.

As Maslow states, "It is quite true that man lives by bread alone – when there is no bread. But what happens to man's desires when there is plenty of bread and when his belly is chronically filled?" (1943, 376). It is broadly agreed that the *Hierarchy of Needs* is not confined to modern society, age and gender, and needs such as aesthetics can be traced as far back as the stone-age (Dutton 2009; Miller 2010; Naish 2008; Postrel 2004). While Maslow's categories are generally agreed upon, the dominant criticism lies in the assumption that they should be executed following Maslow's hierarchical arrangement and the needs being universally innate, thereby lacking the consideration of culture and environment as influencing factors.

Neher (1991), notes in contrast to Maslow, that it is not essential to fulfil all lower level 'needs' in order to pursue the needs at the higher level of the hierarchy. Furthermore, that individuals may skip some needs and levels in their entirety.²¹ Hanley and Abell (2002) and Trigg (2004) assert that in trying to achieve the ultimate goal of self-actualisation, that Maslow regarded social engagement as something to overcome. Maslow de-emphasises the importance of relatedness. Additionally, many critics have argued that Maslow largely ignored the influence of culture and environment on behaviour, with a view that his 'needs categories' were innate in all individuals (Daniels 1982; Neher 1991; Smith 1973).

²¹ However, it is typically understood that needs are sought in a somewhat hierarchical manner and are typically presented as a pyramid and are thus presented here in the same manner.

However, in times of relative material abundance and over-consumption driven by perception of needs in the West, the various 'needs categories' conceptualised by Maslow are of significance to this research. If, for example, a person struggles to attain basic biological and physiological needs, it is the artefacts that provide basic levels of shelter or safety that become their most precious. It is beyond the scope of this study to judge needs per se, and Maslow's hierarchical ordering. However, what is of relevance to designers, is that artefacts may fulfil needs and do not become disconnected from changing needs over time, as these relate to the expectant life span of an artefact.

The contemporary Western societies consumption behaviour that I seek to examine in this thesis, relates to consuming activities well beyond mere fulfillment of basic survival needs (Plummer 1989), are pleasure-seeking (Campbell 1987) and responsible for high disposal rates. The question of disposal rates and the disposal of still functioning objects that I raise in Section 1.3 indicates that consumption fails to fully attain *changing* needs fulfilment.

Maslow's *Hierarchy of Needs* is frequently interpreted by product designers to hierarchically order product requirements, cost of production versus sale-cost trade-offs, and to fulfil marketing. For example, economists such as Anderson, Pasinetti and Lavoie have adopted or adapted this theory (Trigg, 2004). They claim that as income increases, "certain threshold points are crossed at which an individual can move on to address a higher order need" (395). However, this approach ignores the product in motion, its changing meaning over time, exchange of ownership and custodial practices. Design theorists typically interpret Maslow's Hierarchy as:

- influencing the design process to address the basic needs first, in sequence with Maslow's chart, to create the highest design "value" (Lidwell et al. 2003, 124; Crilly, Moultrie and Clarkson 2004), as summarised in Figure 4-3;
- beneficial for marketing and sales purposes and to create "more favourable product evaluations" by consumers (Yalch and Brunel 1996, 406); and
- to best address human factors in a hierarchical order, similarly to Lidwell et al., by focusing firstly on functionality, then usability and then either pleasure (Jordan 2003) or beauty and poetry (Viemeister 2003).

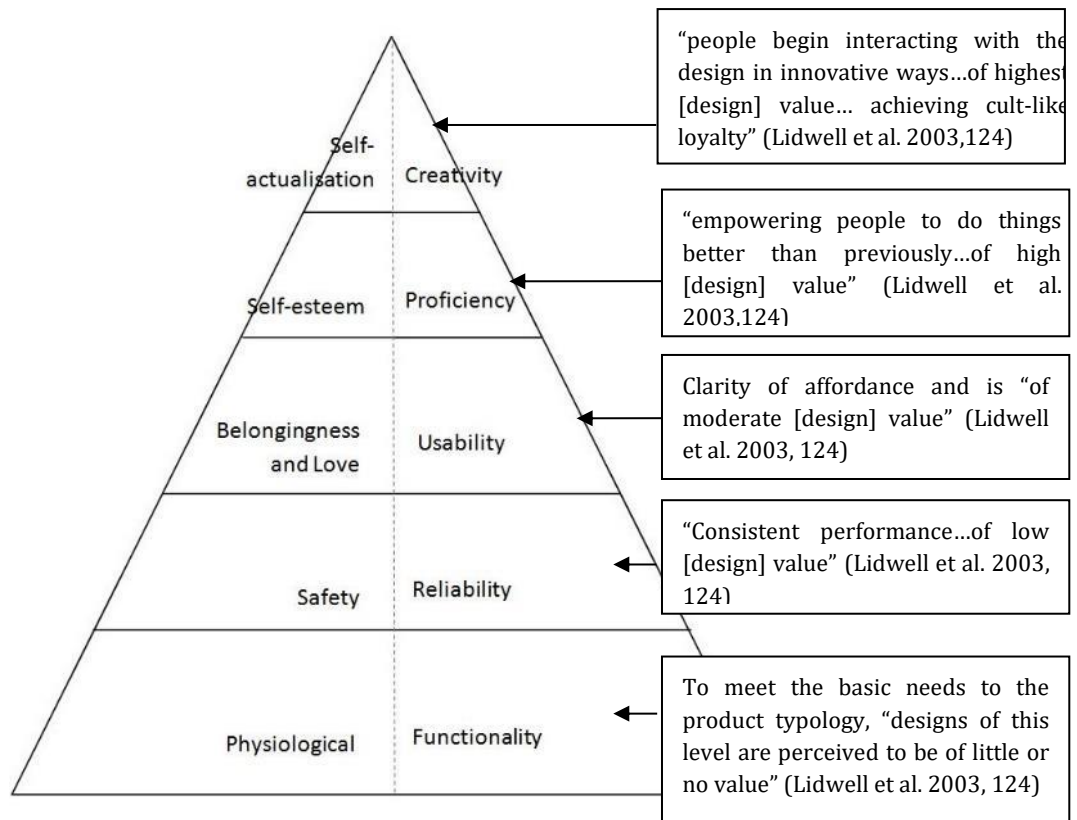


Figure 4-3. Maslow's *Hierarchy of Needs* and Lidwell et al.'s corresponding product design process. Forlano, 2017. Adapted from Lidwell et al. (2003, 125).

The above interpretations in fact help drive fast-consumption, as previously identified, by encouraging the integration of evermore features, greater consumer choice and confusion, and the like. As technology improves, more fulfilment can be promised and more is created at lower price points.

Two alternative positions that seek to take a more socially and environmentally responsible approach, yet still differ to my position, are those of Papanek and Walker. Papanek uses Maslow's Hierarchy of Needs to define which projects deserve the greatest attention. The most basic survival needs of the most disadvantaged should be solved first by product designers and subsequent needs met after that (1972).

Walker uses Maslow's theory to classify enduring objects (2006b, 41) with his categorisation focusses on artefact types in museum collections — largely pre-twentieth century (Ibid. 39), to define which artefacts are 'enduring'. However, many of these artefacts no longer meet twenty-first century functional requirements and have long been out of use. Furthermore, these museum collections reflect the curator's or conservator's perspective of what is of lasting cultural and historical story-telling value without a reflection on endurance. Walker classified objects in relation to Maslow's

Hierarchy in the following way: functional category at the base; social/positional category to fulfil esteem and belongingness; and an inspirational/spiritual category of objects which he claims serve as reminders of profound understanding or beliefs (Ibid. 40) (Figure 4-4).

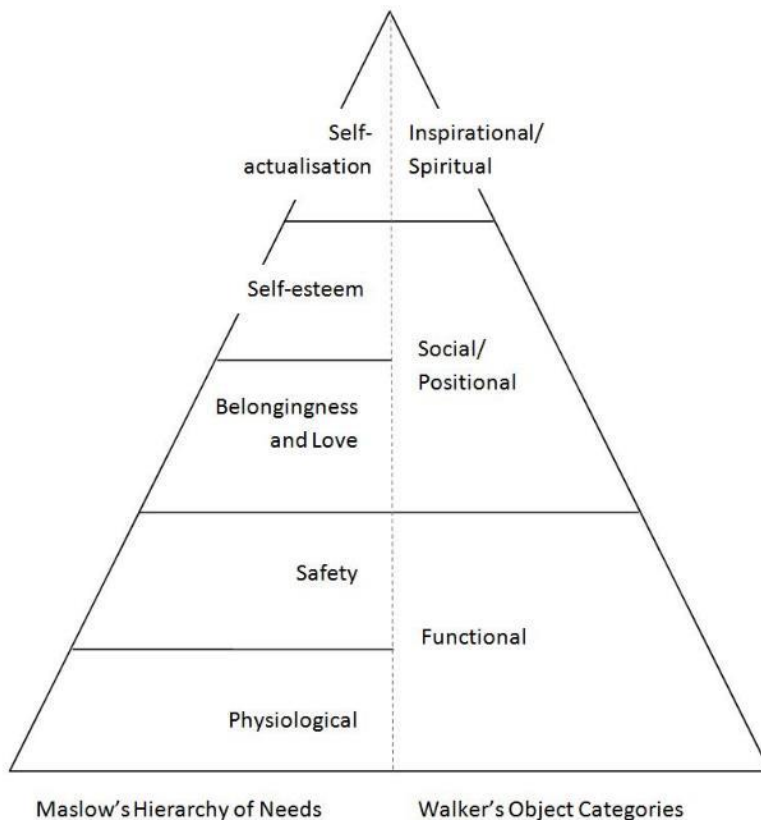


Figure 4-4. Maslow's *Hierarchy of Needs* and Walker's corresponding object categories. Forlano, 2017

I suggest instead, that we utilise Maslow's hierarchy to inform a strategy designed to strengthen the person-object relationship and thereby artefact endurance and in everyday contemporary use. My focus has been on anthropological research that determines what is considered enduring, special and precious by a community, extended family or individual. I utilised the results from my surveys and interviews to relate, for the first time, the 'enduring' artefact *in action* and through experience over time to Maslow's hierarchy. The outcome of this research informs my Enduring Design Framework.

Papanek's perspective on Maslow's Hierarchy to direct designer's efforts toward first addressing the most disadvantaged people's needs is laudable. However, it is also important to consider ways of reducing Westerner's waste through overconsumption.

My focus on reducing overall consumption and waste moves beyond Papanek's argument, to encourage socially responsible design, because:

- i) The magnitude and impact of rising consumption due to extremely low cost, poorly built disposable artefacts, directly affects the employment conditions and income of the disadvantaged (Defazio 2004). As shown in my survey, 45% of respondents agreed that furniture is a throwaway commodity and 9% actively sought out 'cheap' furniture. One respondent who answered that they 'somewhat disagree' that they 'seek' out cheap throwaway furniture also stated:

...depends on if you just want it for the kids when they are little and replace [it] later on, then [I] choose some cheap ones. (Survey Respondent #77, 18-24 age group, female, non- art and design professional)

- ii) Waste, toxicity, water quality and environmental damage caused by disposal affects the poorest communities most significantly (Bullard 2000; Pellow 2004).

To demonstrate this alternative interpretation of Maslow's *Hierarchy of Needs* in relation to artefacts, the figure 4-5 shows product typology examples that relate to each need type, and a brief description of their person-object relationship. This shows how furniture and architectural artefacts can go beyond fulfilling basic survival or convenience needs to attempt to meet more enduring needs, such as the psychological, belongingness, esteem, cognitive, aesthetic, and self-actualisation or transcendent needs. Based on this interpretation I then explain the person-object relationship characteristics of enduring artefacts in relation to the Enduring Design Framework (Forlano, 2017).

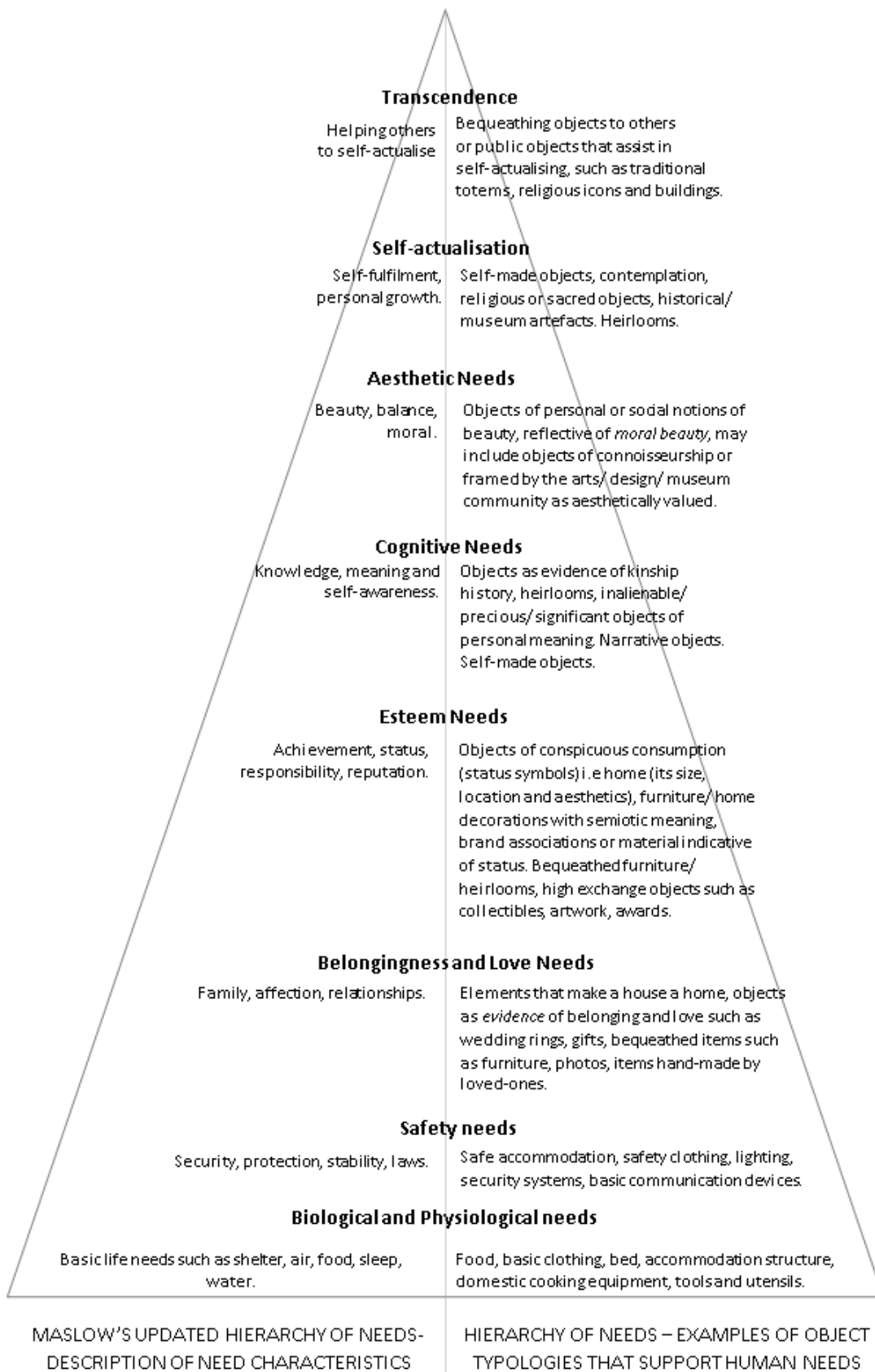


Figure 4-5. Object Typology Chart of Maslow's (expanded) *Hierarchy of Needs* (1970). Forlano, 2017. Adapted from McLeod (2017, fig. 3).

Inalienable and enduring objects typically carry a connection to belongingness, social others, places, times and events (Csikszentmihalyi and Rochberg-Halton 1981; Schifferstein, Mugge, and Hekkert 2004; Wallendorf and Arnould 1988) through memory. Memory is intrinsically linked with objects as they “furnish recollection... stimulate remembering... (and) form records” (Kwint 1999, 2) of one’s life, and thereby objects carrying this memory fulfil higher level needs.

During my fieldwork on custodian-heirloom behaviour, an interviewee who is also an artist supported this notion that artefacts can act as transcendence, that is to help him self-actualise, as one of his collected ‘special’ artworks not only fulfils his cognitive and aesthetic needs but acts as evidence of another’s self-actualisation:

Fred: ...I find (it) inspiring [the work of another artist] ... because often when I go to paint and do work ... [I see] something like this, he’s just pushed on, and kept working...So it’s inspiring me to, uh... keep working. And having stuff up, like those cuttings and stuff, and a lot of the stuff that I collect ... [contains] essence of something... an interesting balance that is often quite hard to pull off [artistically.] (2016)

For this artist, works by others can drive his self-actualisation.

A similar example emerged when I was conducting research for the creative work, *The Unforgotten* cabinet. The participant’s most precious objects were those that she had kept for over 60 years in a small box that best verified social relationships and the self-actualisation of her mother; a significant ‘past other’ whom she had never met. The objects of handcrafted silk lacework, handwritten transcribed poetry, and illustrations by her mother, were precious and retained because together they were a *verifiable* connection to her mother, and a material possession containing evidence of her mother’s mastery of a hand-skill.²² These objects thus fulfil the role of a sacred or heirloom artefact via their connection to an ancestor’s past existence.

Consequently, these special objects reflected back upon her through ownership, by fulfilling a sense of belongingness and identity *through* the object, thus fulfilling Maslow’s *belongingness needs*. While some objects may fulfil needs temporarily, it is

²² These artefacts were described by the client as being created in the last year of her mother’s life and were created for her new family life as an expectant mother. As the work is of a decorative and non-essential nature it can be presumed that this was made to her aesthetic desires. As one of the last works she created, it is seen as precious and high quality by her daughter, and thereby is presumed by the daughter to be the best work of her mother’s, thus the closest attainment of creative self-actualisation.

clear that the non-functioning attachment to these precious (or enduring) objects which their owner had kept for over 65 years was due to their role in connecting and verifying her identity.

In summary, many objects provide consumers with wide and more affordable choices to facilitate survival needs, but these are easily replaceable or temporary, as identified for example in the lower left quadrant in Figure 1-2. Objects of greater significance such as those deemed of beauty, with poetic qualities (Viemeister 2003), may meet needs for esteem, belongingness and cognitive fulfillment, or what is typically referred to as higher needs, and these do satisfy in a more emotionally enduring manner. However, it is also those objects that facilitate the fulfilment of a variety of needs that become the most socially or emotional enduring. Within this group, I include religious icons, inalienable family heirlooms, or community artefacts such as museum artefacts, sacred sites, religious or cultural totems, and so on. This suggests that prior research in applying Maslow's theory to product design has failed to interpret artefacts in this way and has not considered the evidential role of artefacts in fulfilling all human needs.

4.3 THE NEED FOR EVIDENTIAL QUALITIES

The main point that I make via this exegesis and associated design practice is that vital aspects of enduring artefacts are not typically captured in design discourse or considered in depth by design practice. The pervasive approach to understanding design functions fails to consider what I term the *evidential function* of enduring artefacts. The evidential function of artefacts includes the ability of artefacts to act as evidence or verify a past. For example, artefacts function to help recall memory, verify social connection (for example, ownership of heirlooms asserts the social role within the kinship group), or proof of past experiences, such as travel, events or incidences. By failing to conceptualise how artefacts can confirm one's biography and conversely can contain a biography or social life of their own, designers are failing to consider designing for attachment and endurance, that simultaneously offer opportunities to fulfil Maslow's higher needs.

As Baudrillard notes in *The System of Objects*, it is the "unique... folkloric... and antique objects... that answer to other kinds of demands such as witness, memory, nostalgia or escapism" (1968, 77). These objects fall partly outside of design theory and analysis of artefacts, as the tangible evidence of experience is not generally within the control of design.

There is too, a fear of the loss of self through the loss of the authentic material witness (Belk 1988, 142), whether it is through natural entropy or through failure of taking care of the object, indicating the importance of the authenticity of the object as evidence of experience. This fear of loss of self (via the object) or its authenticity also elicits custodial practices in the possessor. This reinforces why the evidential function is of prime importance to the design of enduring artefacts and the creation of ongoing experiences to engender custodianship.

I have used attachment studies and anthropology, as these have enabled me to discuss the experiential qualities that are imbued in artefacts, such as significant events and values, the embodiment of a social other, and the fulfilment of significant needs. Even so, I found that I needed to further develop Verbeek's post-phenomenological framework, as it addresses experience only in terms of object mediation and agency, that is, as a by-product of its functional use. Consequently, it still falls short of capturing the *evidential function* of artefacts through experience.

A Saussurian semiotic perspective is typical in much object design analysis (Vihma 1995). In semiotics, visual signs stand in for something outside the object itself and would assert that an object with a particular signification or 'personal meaning' to the owner could be replaced with a new equivalent/replica (Grayson and Shulman 2000). Yet it is clear from the findings that the evidential nature of artefacts is a result not of how something appears, but of experience, and that the perceived direct connection to another that is embodied within the artefact (place, person, event or time) plays a major role in attachment and is thus also not entirely captured by Semiotics.

The evidential is also largely immutable in comparison to the symbolic. It is the long-term immutable, irreplaceable and inalienable qualities that through the passage of time, creates an evolving person-object relationship with depth of emotion and memory that should be captured within an Enduring Design Framework.

As Curasi, Price and Arnould note in relation to artefacts that are passed onto to others:

Keepsakes are indexical symbols, items with an evidentiary function, able to serve as a testament to important life events (Grayon and Shulman 2000)... In part because of the salience of corporally indexical associations, researchers question whether keepsakes can and will be retained by future generations ...yet research shows older generations... bequest keepsakes in the hope that they will become inalienable... (and) stay in the family. (2004, 610)

This aspect of reappropriation of enduring artefacts and the irreplaceable quality of the 'used' is of particular importance. It demonstrates the need for care and custodianship through the passing down of stories, potentially embodied in the artefact's materiality. Therefore, I have expanded Verbeeks' object analysis approach.

Verbeek identifies three core functions of artefacts:

- Technical mediation function (the by-product of the object in use);
- semiotic function (the indicative, connotative and formal-aesthetic functions that are the by-product of the object appearance), and;
- practical function (the instrumentality).

The additional category I propose is the evidential function; that is, the by-product of use over time. It is over time in which the artefact becomes singularised, as it is imbued with social relations and forms evidence of existence of past events, places, and people.

The artefact that serves as evidence or a reminder of activity or achievement that meets Maslow's higher needs of esteem, belonging, and actualisation as well as contemplation, and Borgmann's 'engagement' (1995, 15), is coveted, as shown in the summary of attachment determinants (Figure 4-2). In this way, artefacts fulfil a higher motivation through a mnemonic link to self-actualisation, values and engaging activities typically characteristic of how heirlooms are related to.

Design theorists widely ignore the evidential aspect of artefacts. For example, Walker, in his categorisation of museum artefacts, describes their value in terms of "utility... decorative and aesthetic qualities, and/or their symbolic or ritualistic roles" (Walker 2006b, 40). Walker fails to identify the more overarching and important aspect of the museum collection; that is, the authentic and evidential nature of the artefact. Furthermore, he then applies his incomplete analytical understanding to the design of enduring artefacts.

In the retainment of artefacts and how they cue custodianship and care, design must consider the irreplaceable quality that emanates from the evidential function, that is in turn perceived to be embodied materially. The *evidential function* is a by-product of our experience with an artefact, in which we imbue it (or in which it becomes ‘contaminated’ in the Belkian sense) with a singularised quality that deems it irreplaceable. This phenomenon is particularly obvious in the difference between the original and a replica. The original is deemed irreplaceable, whereas the custodian and holder of memories does not regard an artefact that is equivalent in every technical way as the same as the original. I have thus revised the Object Analysis Chart by Verbeek (2005) to contain my theoretical contribution.

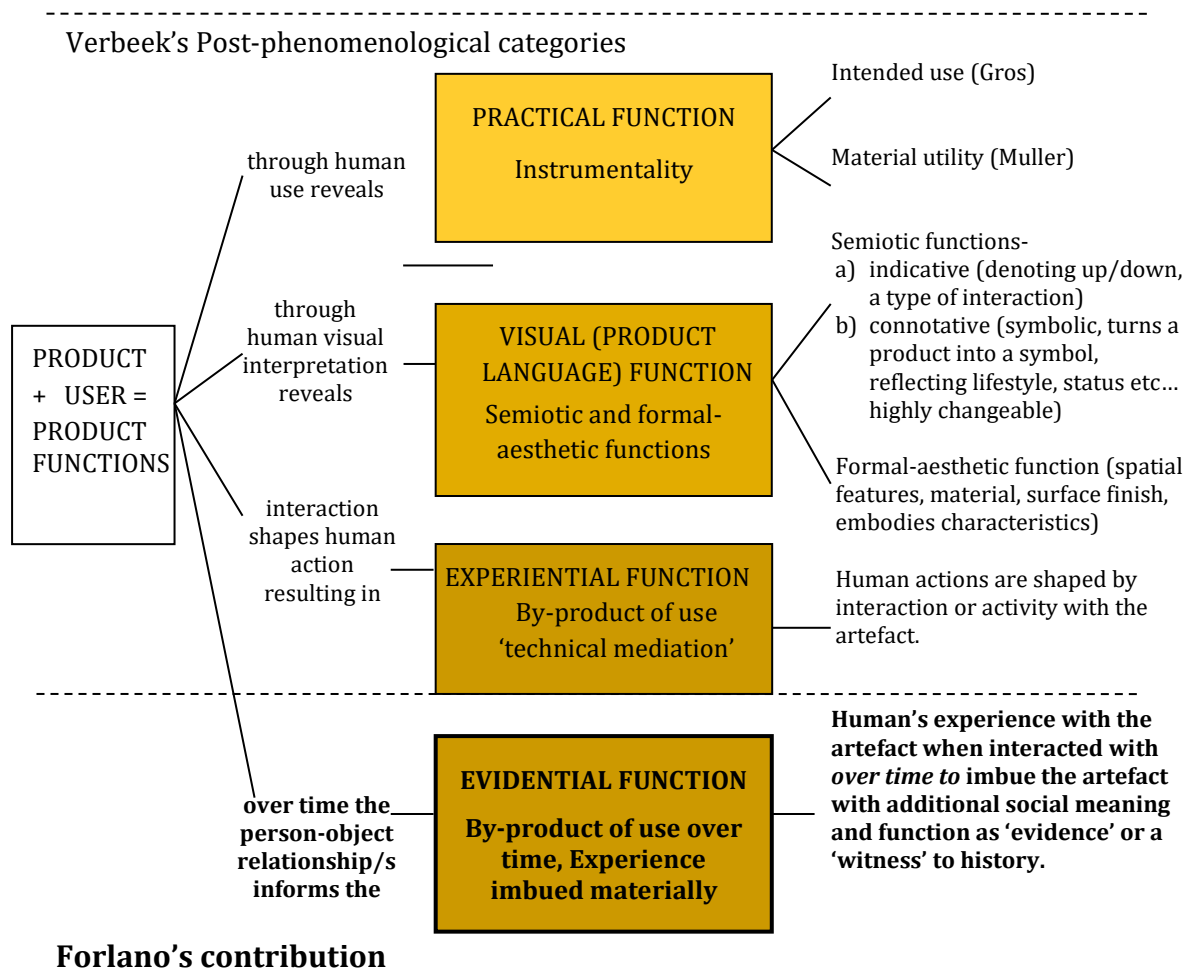


Figure 4-6. Revised object analysis chart, Forlano, 2017. Adapted from Verbeek (2005, 206).

In Chapter 5, I explicate my theory through an Enduring Design Framework and apply it to my practice in Chapter 6.

CHAPTER 5 EMERGENCE OF AN ENDURING DESIGN FRAMEWORK

When designing for long-term emotional endurance, active consideration of the long-term needs of the first owner and the reappropriation rituals of subsequent owners is required. Reappropriation through the physical endurance and quality of production is often indirectly considered by designers, such as by cleaning, restoration or other forms of renewal to an object's preferred state. However, this thesis informs designers by revealing a range of reappropriation rituals and acknowledging the possible design approaches to facilitate these rituals, with the aim of empowering them to design for artefact endurance.

This chapter opens with definitions of the three reappropriation rituals — recovery, divestment and transformation — identified by Gregson and Crewe from their research into second-hand culture and reappropriation. I identify two additional rituals that are implied within other literature or observed from industry practice and research but are not yet conceptualised as reappropriation rituals. These are 'custodial priming' and 'curatorial reframing' rituals. They are particularly pertinent to the Enduring Design Framework, as they enable re-use cycles that evade disposal. Although these rituals are characterised by actors other than designers — the curator, bestower and custodian — they can be facilitated through the design process, as I will illustrate.

Building on the rituals identified, and my research into custodial practices, I have developed an Enduring Design Framework that will inform the design process for artefact endurance. Each constituent principle in the Framework synthesises attachment theory and the person-object relationship, enduring needs, and reappropriation. These are supported by practice exemplars and personal creative exploration. Importantly, each principle contains a summary of tangible ways the principle may manifest as a guide for designers. I discuss my own creative practice at length, from which the principles emerged or were reflected, in Chapter 6.

5.1 ACTORS AND PROCESSES THAT EXTEND ARTEFACT LIFE

There is a range of behaviours that consciously extend artefact life, despite the market and industry driven push to overconsume. ‘Conscious’ or ‘voluntary simplicity’ consumers are driven by the desire for a better life, better world, or more environmentally-friendly consumption behaviour (Cherrier, Black and Lee, 2011). However, these behaviours are in the minority (Devinney 2006; Devinney, Auger, and Eckhardt 2010). Consumers, despite claiming to desire ethical consumption in surveys, rarely carry this out in practice (Devinney, Auger, and Eckhardt 2010; Eckhardt, Belk, and Devinney 2010).

My research acknowledges this phenomenon, where attitude varies from behaviour, and accordingly, I focus on custodial and reappropriation behaviours — how these occur, and how they can be encouraged by design.

Successful custodial and intergenerational transfer relies on the new possessor’s reappropriation rituals. Gregson and Crewe’s (2003) study of second-hand consumption culture identifies three reappropriation processes that enable connection to the new possessor:

1. ‘Recovery rituals’ are built from traces of the previous owners to create “meaning through real or imagined historical reconstruction... [meaning that consumers believe these qualities are] trapped within the commodity” (Ibid., 147). Here the “consumer’s work” (144) in recovering a story is fundamental.
2. ‘Divestment rituals’ are where traces of the former owner are removed, enabling new psychological ownership (Gregson and Crewe 2003; McCracken 1986, 80). The original design is cleaned, renewed, or has parts replaced. Importance is placed on removing odours, stains or unwanted traces of prior ownership or another’s identity (McCracken, 1986, 80) and returning it to a perceived previous state.
3. ‘Transformative rituals’ focus on the consumer’s transformation of the artefact “to transfer, obscure, lose or restore the meaning of goods when they change hands” (Gregson and Crewe 2003, 144).

Designers rarely consider the potential of imagining or romanticising an artefact’s past when designing goods. Artefacts can enable a sense of (re)discovery via a story or through evidence of a pattern of use. Appadurai (1986) and Kopytoff (1986) refer to this as part of an object’s ‘social life’. This imagined artefact life is typical of custodians and

collectors (Belk 1995) and enables ongoing interest and artefact empathy. Narratives form connections to significant events, people, kinship relations, expression of another time, or the artefact's fabrication, but are, as I discuss later, underexplored by design practice in the built environment.

However, there is a gender difference in this experience. Gregson and Crewe point out that "...narratives of the imaginary potential of commodities are... almost exclusively from men" (2003, 154-5), whereas women focus on factual stories. This is confirmed through interviewee's stories in this study.

Many of my male respondents found that artefacts were contaminated with what the collector imagined to be imbued meaning. Their experiences support the notion that the surface and transformation of form can become an opportunity for storytelling. For example, Fred had imbued the axe head (and other artefacts) he showed me with an imagined history;

Fred: I could see where [the original owners] had been using the axe and it had broken.... But they didn't throw it out... the pattern of wear on it, [indicated] they had been using it as a hammer... Even though it was broken... it had worked and worked and worked. (2016)

Here, as with many other artefacts, he did not know the owner or have any indisputable evidence of the artefact's history, but instead pieced together a plausible, imagined story;

Fred: [I]t's almost like being a detective. A lot of the photos were from [the previous owner's] overseas trips, going down the Suez Canal in Egypt... Now these boxes [in which they were found] were ... [the type] ocean liner companies would get from the different manufacturers. (2016)

In contrast, my female interviewee and survey respondents recalled only factual and kinship stories. The stories were either handed down or obtained through direct experience. Louise, for instance, discusses how a piece of furniture was used in the family home, its provenance, materiality, and what was stored within it:

Louise: ...this item... was made for records.... It's got sliding glass for the front, [but one of my sons] went backwards on the chair and smashed [a glass pane] ... [M]y grandfather...made this one...he was an inventor in Holland. He was an artist... I remember my grandmother had it in her house. And then...my parents had it for a couple of years until I moved out... I think it was only five years... and then [they] pass[ed it] on [to me]. (2016)

The data from the two in-depth interviews and survey with 86 respondents that I carried out reinforced the findings from background literature and the need to separate imagined stories from the authentic ones.

Not all survey respondents engaged in divestment rituals; some only sought second-hand items and collectibles that they did not want to change. However, their responses more generally indicated that if designers planned for ease of divestment and transformative rituals, artefact longevity could be extended. One female who responded that she did not restore furniture commented that: "If I had restoration skills, I'd answer differently!" (Survey respondent #7. Female, 35-54 years of age, non-art/design professional, 2016). Enduring design should then consider ways in which the design enables less costly or more self-evident ways to repair, replace or renew parts.

In summary, Figure 5-1 shows Gregson and Crewe's reappropriation rituals in the upper section. An owner dispossesses the artefact, and the artefact may or may not undergo a ritual of recovery, divestment or transformation by a consumer and is subsequently re-owned by a new possessor and the cycle continues, or/until it is discarded.

5.1.1 BESTOWERS AND CURATORS

I have identified further rituals in second-hand culture illustrated in the lower section of the figure. Although Gregson and Crewe refer to second-hand dealers, they fail to identify these actors and the distinctive ritual that occurs; I have termed this 'curatorial reframing ritual'. The final ritual I have named is the 'custodian priming ritual' occurring when the owner, who acts as a bestower, primes the future custodian. I have named these rituals and actors (shown below the dotted line in Figure 5-1) based on existing research. I conceptualise these two rituals as part of reappropriation rituals to highlight the potential for design to facilitate these processes.

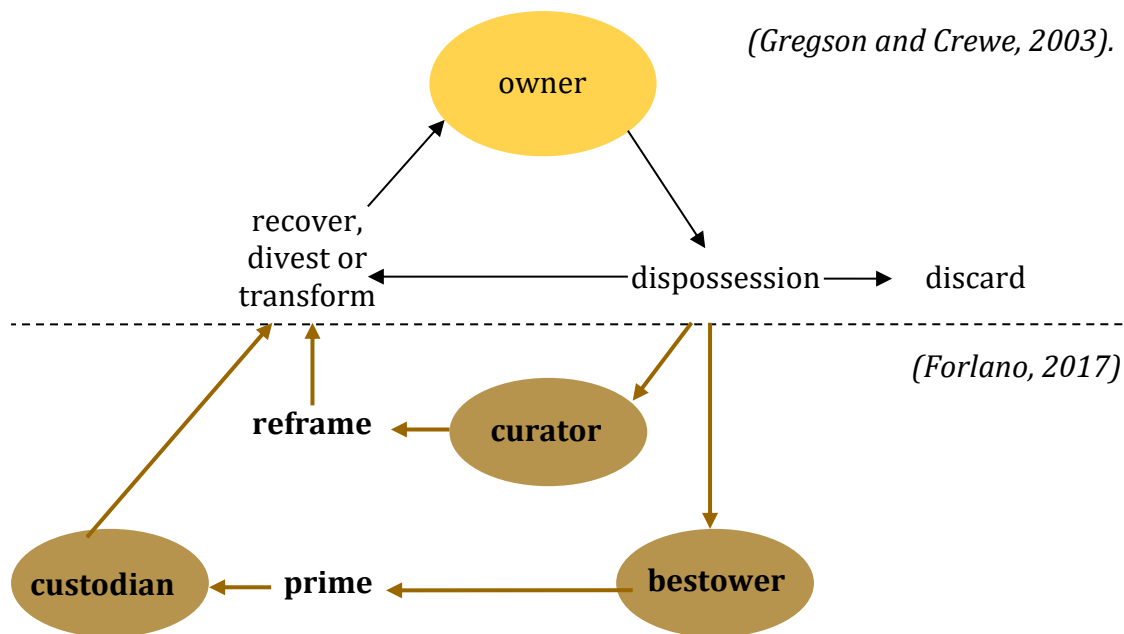


Figure 5-1. The Process, Actors and Rituals of Reappropriation. Forlano, 2017.

While Gregson and Crewe’s ‘recovery ritual’ relies on the “consumer’s work” (2003, 144) in recovery, custodial priming differs, as the owner or someone acting on their behalf psychologically dispossesses the artefact, and then becomes the bestower by transferring the imbued meaning to another person. The ritual is characterised by a future ‘custodian’ being selected and primed with artefact knowledge by the bestower for their caretaking role of the artefacts and its stories (Curasi, Price, and Arnould 2004, 611). The uniqueness of this ritual compared to those identified by Gregson and Crewe is that the artefact’s story is *intentionally transferred* (not recovered or constructed) through a social network or literature.

Priming may occur over years and be highly detailed or bestowed with little information to maintain the artefact’s narrative. Bequeathing or bestowing objects is typically prevalent amongst kinship relations. However, I found no design practice examples that were specifically designed to ease kinship narrative transfer between the bestower and custodian. My creative practice addresses this absence and ways of transferring narrative through the artefact to encourage endurance and reappropriation. This is discussed in Chapter 6.

A custodian is in care of and has a compassion toward artefacts. For Elkman (2010), compassion emerges from empathy. Theodor Lipps describes *Einfühlung* or empathy for an object as “the ability to sense an inner movement that takes place between the object and the subject” (Lipps 1905, cited in Bruno 2014, 194) on the basis of a psychic state of closeness, pleasure and interaction (Bruno 2014, 194). This raises the need for design

practice to incorporate opportunities for closeness, pleasure and interaction, to encourage custodial practices and bestowal in lieu of disposal.




The final ritual I identify is the 'curatorial framing rituals'. These rituals are performed by a curator — be they a collector, aficionado, dealer, or professional curator — as an intermediary between the users' ownership. Here the knowledge about the artefact is not only retrieved but is culturally *framed* (Miller 2010). By this I am referring to how an object's meaning is imbued by an expert or curator's 'framing'.

Framing can occur through informal display or formally through media, an historical museum, or its lodgement in the collection of a noted group, famous individuals or curators. Here the intermediary's expertise can re-ignite or create a new meaning and value in objects through 'aficionado-appeal'. What an ordinary person may not notice, may be of importance and a salient distinction to aficionados (Jung et al. 2011, 67) which raises the artefact's perceived value, giving it 'aficionado-appeal'. Aficionado-appeal emerges when knowledge is developed among a community of individuals interested in that genre or artefact type (Jung et al. 2011, 67).

Gregson and Crewe refer to the owner's interest in authentic artefacts so they can exercise their connoisseurship and knowledge or imagining of an artefact's history (2003, 154). Gregson and Crewe refer to object 'geographies,' such as museums and auction houses, to car boot sales or opportunity shops, as contributing to artefact value, but do not recognise this as a separate 'framing' ritual, nor do they identify the intermediary's role as contributing to a distinctly different ritual.

The curatorial priming ritual is distinct, as the intermediary acts as a curator, reframing artefact meaning by transferring knowledge to the unaware and unskilled consumer. The imbued quality is inferred by how the work is framed, not through recovery or imagination by the consumer. The consumer may never gain the skills of a connoisseur or aficionado. Instead the curator acts to inform others, raise interest in the artefact and extend its lifespan, which would otherwise not occur.

Pamono are an online "one-of-a-kind marketplace [of] distinctive design objects" including vintage, antiques and collectibles (Pamono, 2016). The webpage of *Pamono*, shown in Figure 5-2, exemplifies this form of 'framing' phenomena by curators and re/sellers. Through the 'curatorial framing ritual', they have identified particular second-hand, mass-produced goods by the world leader in low-cost, high-volume furniture production, *IKEA*, and re-framed the artefact as a collectible.

P  M  N  ikea

What's New Vintage Contemporary Furniture Lighting Accessories Stories Design Guide Sale

Home

Search results for 'ikea'

> Products

Vintage or New?

Contemporary

Vintage

Price

\$292.00 - \$5,676.00

Designer

Boysen, Bent Gantzel

Mobring, Karin

Panton, Verner

Werts, Erik

Wertz, Eric

Manufacturer/Maker

Bodafors

Ikea

Style

Vintage

Mid-Century

Industrial

Scandinavian Modern

Contemporary

[Show More](#)

Design Period

1920 to 1949

1950 to 1959


1960 to 1969

1970 to 1979


1980 to 1989

[Show More](#)


Color




Diana Architectural Easy Chair by Karin Mobring for IKEA, 1972
\$462.00




Swedish Architectural Diana Easy Chair by Karin Mobring for Ikea,
\$711.00




Swedish Table Lamps from Ikea, 1970s, Set of 2
\$345.00 ~~\$399.00~~




Red & Yellow Gradient Duett Pendants by Bent Gantzel Boysen
\$527.00




Wire Side Chairs by Niels Gammergar for Ikea, 1983, Set of 2
\$1,397.00




Vilbert Chair by Verner Panton for Ikea, 1993
\$1,453.00




Diana Architectural Easy Chair by Karin Mobring for IKEA, 1972
\$924.00




Red Bentwood Children Chairs by Anna Mobring for IKEA, 1963, Set of 2
\$439.00




Vintage Industrial Floor Lamp from Ikea
\$535.00 ~~\$564.00~~




Guide Shelving Unit by Niels Gammelgaard for Ikea, 1985
\$944.00




Swedish Kroken Lounge Chairs by Christer Blomquist for Ikea, 1970s,
\$2,525.00




Premiär Easy Chairs by Per-Olof Scotte for IKEA, 1950s, Set of 2
\$2,745.00



Vintage White Duett Pendants by



Vintage Ikea Shelving Unit, 1970s



Vintage Vilbert Chairs by Verner

Figure 5-2. Screenshot of Pamono's webpage for search result 'IKEA', 2016. Source: www.pamono.com. Accessed 24 September 2016, <https://www.pamono.com/catalogsearch/result/?q=ikea>

Pamono's connoisseurship and knowledge reframes the perception of the artefact by creating a provenance and object genealogy. Their framing techniques include identifying the furniture as part of their exclusive 'vintage' collection of historically relevant works, the price point, naming the designer, giving a detailed description, and providing verifiable expert knowledge to the consumer. This framing extends product life-span and enables artefacts to re-enter the use cycle.

The five reappropriation rituals I have described, which are largely unconsidered in the design process, must be understood and incorporated in order to develop enduring design strategies beyond a single owner. These reappropriation rituals reveal considerations for designing artefact endurance and the associated consumer behaviour, such as: object empathy, ability and creativity in re-purposing, re-imagining and reconstructing artefact history; information transfer through priming or framing; and how future owners may need to divest or transform artefacts. These behaviours retain, care for, restore, and 'rescue' objects through a perceived social life and historical relevance, saving artefacts from disposal.

5.2 AN OVERVIEW OF ENDURING ARTEFACT CHARACTERISTICS

Of particular relevance for this research into furniture and the built environment is the age at which people aim to control their physical environment. During a person's late teens and early twenties, important artefacts are typically those that reflect esteem and achievements. Beyond this age, artefacts that come to represent memories, kin, social values and social group belongingness, are increasingly associated with attachment behaviour (Csikszentmihalyi and Rochberg-Halton 1981, 119).

This alignment of the age of furniture consumption with the desire for artefacts reflecting memory and belonging was evidenced in the survey. Table 5-1 reveals the extent of respondents' agreement on what defines long lasting artefacts characterised by intergenerational ownership, and the responses in relation to the instrumental, aesthetic/ visual and experiential functions of artefacts.

Table 5-1. Heirloom qualities in descending order according to survey responses. Forlano, 2017.

Personal significance			X	94
Mnemonic of life story			X	86
Are to be cared for			X	86
Mnemonic of the past/ based on its past			X	84
Are well made	X	X	X	79
Heirlooms can't be bought at a shop, they emerge over time and through experience			X	77
Memorable and unique		X	X	75
Rare or difficult to replicate	X	X	X	69
Nostalgia is visible in its design or appearance		X		66
Are aesthetically timeless		X		46
Are not mass-produced/are handmade		X		41/40
Have patina or an aged surface		X		32
Heirloom's aesthetics need to fit into the aesthetics of your space		X		20
Are based on appearance		X		17

Despite the design rhetoric that 'timeless' or 'classic' design endures, only 46% of survey respondents thought heirlooms were aesthetically timeless; 23% thought they were simple and elegant in form; and only 13% thought heirlooms should be able to 'fit' into any décor.

Furthermore, although furniture consumption attitudes may have shifted in recent decades, this survey reinforces that the most enduring are defined by the artefact's experiential, relational and mnemonic role developed *over time*, as identified by Csikzentmihalyi and Rochberg-Halton (1981, 61).

Objects with the deepest attachment are found to be mnemonic of significant life events, people, places and times (Ibid.). This reflects Maslow's *Hierarchy of Needs*, and yet attachment is rarely explored in contemporary design.

The design of enduring built environment artefacts that connect to self-identity in terms of "higher level qualities such as intellectual honesty, spirituality, and connectedness" (Ball and Tasaki 1992, 170), or connect to kinship identity (Heisley and Cours 2007) or

a “group spirit” (Csikszentmihalyi and Rochberg-Halton 1981, 34), offers opportunities for connection to enduring long-term identity for multiple generations. For example, Heisley and Cours’ “kinship-embedded self” is the self *embedded within* the identity of one’s family, that is part of the ‘self’ yet is not part of the selfhood that changes due to life events (2007, 426). The kinship-embedded self remains highly personal, powerful and unchanging, as it refers to historical belonging within kinship relations. This indicates a significant consideration for the design of enduring artefacts that can grow with the self’s changing needs yet remain relevant and can also be reappropriated by relatives over the artefact’s lifetime.

Recent studies demonstrate that people who collect or keep obsolete objects,²³ yet fail to dispose of these, do so to remain connected to others, to provide a sense of security, and to keep history and memory alive while creating a new future where past and present co-exist (Cherrier and Ponnor 2010). *Inalienable* objects, that is, objects of deep connection to kin and deemed irreplaceable, to be retained and conserved, fulfil this role. Connection adds to the perceived stability of the inalienable possession and can defuse the perceived sense of ‘lack’, which, as noted by Crocker (2016), drives fast-consumption.

Enduring objects are also a form of symbolic materialisation of *idealised* moments, whether imaginary or real (Gregson and Crewe 2003). Sacred or spiritual objects take this a step further and provide reification of the immaterial and spiritual values, to enable self-actualisation and the self-actualisation of others. Although the purpose of my research is not an attempt to form spiritual connections, it does look to emotionally enduring qualities that symbolise or create material connection to the past, to social relations, and transcend superficial materialism as a means for object endurance. I contend that intergenerational longevity can be afforded by embedding opportunities for enduring values and needs and creating social connections and an idealised narrative.

²³ This statement is related to healthy collector and consumer behaviour, that is, it excludes *non-functional hoarders* (Cherrier and Ponnor 2010).

5.3 UNPACKING ENDURING PERSON-OBJECT RELATIONSHIPS

What are the person-object relationship characteristics of enduring artefacts? In summary, it is now clear that the most enduring of objects are intrinsically linked to the person-object relationship, particularly as it extends beyond merely functional or aesthetic needs, but supports higher psychological needs and acts to remind or verify experience. It is clear that enduring objects are not based on aesthetic or functional achievements alone, but are instead dependent on the relationship between person and object.

The characteristics which emerged can be positioned along a continuum from the person-object relationship that results in artefacts of premature disposal, to those contrasting characteristics of enduring artefacts. Table 5-2 introduces a summary of the person-object relationship characteristics of enduring artefacts, built from the literature reviewed and discussed thus far. The perception of the person-object relationship that leads to endurance is then translated into enduring design approaches in Table 5-3 and explained in detail thereafter.

Table 5-2. Factors affecting person-object relationship endurance viewed as extremes along a continuum, 2017. Forlano, 2017.

Impersonal P-OR	Personal P-OR
Non-self-concept P-OR	Self-concept P-OR
Disconnected P-OR	Connected P-OR
Obscured and indistinguishable P-OR	Authentic and Irreplaceable P-OR
Disenchanted P-OR	Enchanted P-OR
Function-based and lifeless P-OR	Social relation based and lively P-OR
Temporary P-OR	Evolving P-OR

Although artefacts reveal identity, when objects are globally accessible by disparate social groups and mass produced, their meaning fluctuates and is readily influenced by external factors and marketing (Tilley 2006). Commercial furniture is marketed to highlight ‘newness’, to trend associations and for short-term enjoyment, rather than matching the duration of emotional connection to the duration of the artefact’s functioning life.

Design, associated industries and lifestyle factors have successfully participated in *making consumers*; that is the consumption of resources in an endless cycle, resulting in

frequent purchases and waste. I hypothesise design can *make custodians*; that is encourage a person-object-relationship responsive to the call of things, their power, agency and empathy, to care for, retain, prime and hand them on to others.

Contradictory to the prevailing consumer behaviour, collector and custodial practices is markedly different. Custodians raise the status of the object through re-contextualisation, giving it new meaning and a special physical and metaphorical place in their world.

Designers can imbue artefacts with qualities that afford custodian-heirloom behaviour through the following strategies:

- Move beyond shallow or temporary fashionable meaning to a more intimate, personal and cherished relationship to the artefact.
- Enable opportunities for reflecting one's positive self-concept, in keeping with Maslow's esteem needs.
- Deepen the extent of meaning making opportunities to include kinship.
- Create works with greater authenticity, uniqueness and irreplaceability to encourage a caretaker relationship toward the artefact.
- Provide opportunities for enchantment, awe, wonder or discovery in the artefact, a way to maintain engagement in the person-object relationship to fulfil ongoing cognitive and aesthetic needs.
- Create opportunities for the possessor to be reminded of significant social others and social values.
- Enable an evolving relationship to maintain the possessor's engagement.

Significantly, the literature research and the survey and interview responses indicate that artefacts that demonstrate a *multitude* of the above traits create stronger person-object relationships. This supports Belk's (1988; 1995) and Gell's (1998) assertion that a person's life and the object's life then appear to bind and entangle themselves, so the artefact becomes a part of the self, through self-extension and the self as contained within the artefact. It is this entanglement between object and person that creates strong irreplaceable qualities that should be sought in the design of artefacts.

5.4 THE ENDURING DESIGN FRAMEWORK

The attributes discussed above are the basis of a framework to assist designers to create new works and/or theorists to critique existing works and their potential for emotional endurance. Table 5-3 indicates the links between the findings of enduring person-object relationships (left column as summarised in Table 5-2), my proposed enduring design approaches (central column), and how it fits within the post-phenomenological understanding of object function categories (right hand column), as discussed previously. The definition of each of the twelve constituent parts is then expanded upon in the following sections 5.5 to 5.16.

Table 5-3. Enduring Design Framework Summary. Forlano, 2017.

Personal P-OR	Design for Bodily Accordance through direct bodily interaction with surface, form and motion	Mediatory function
	Design for Empathic Visual Relations through visual and spatial cues	Product language and Evidential function
Self-concept P-OR and Connected P-OR	Design for Kinship and Self-relatedness through connection to self or extended family	Product language and Evidential function
	Design for Self-actualisation reflect a cognitive and emotional goal	Product language and Evidential function
	Design for Community Connectedness through cues to wider social groups	Product language and Evidential function
Authentic and Irreplaceable P-OR	Design for Framed Provenance through factual knowledge of origins	Evidential function
	Design for Narrative through user constructed or imagined stories	Product language and Evidential function
	Design for User Interaction Through using, making or co-designing	Product language and Evidential function
Enchanted P-OR	Design for Enchantment through engagement and contemplation	Product language and Evidential function
Social relation based and lively P-OR	Design for Liveliness through relational and visual anthropomorphism	Product language and Evidential and Mediatory function
Evolving P-OR	Design for Aging aging over time	Product language and Evidential function
	Design for Evolving Physical Transformation through cognitive, visual and physical engagement	Product language and Evidential function

The design precedents used in this chapter are relatively ‘young’ artefacts, yet to be tested for longevity through time. However, as I am focused on contemporary and future solutions, and manufacturing processes have transformed considerably in the last 20

years, it is a more appropriate way to demonstrate these principles through contemporary examples to assist practising designers.

The Enduring Design constituent parts are illustrated in Figure 5-3 and is explicated thereafter.

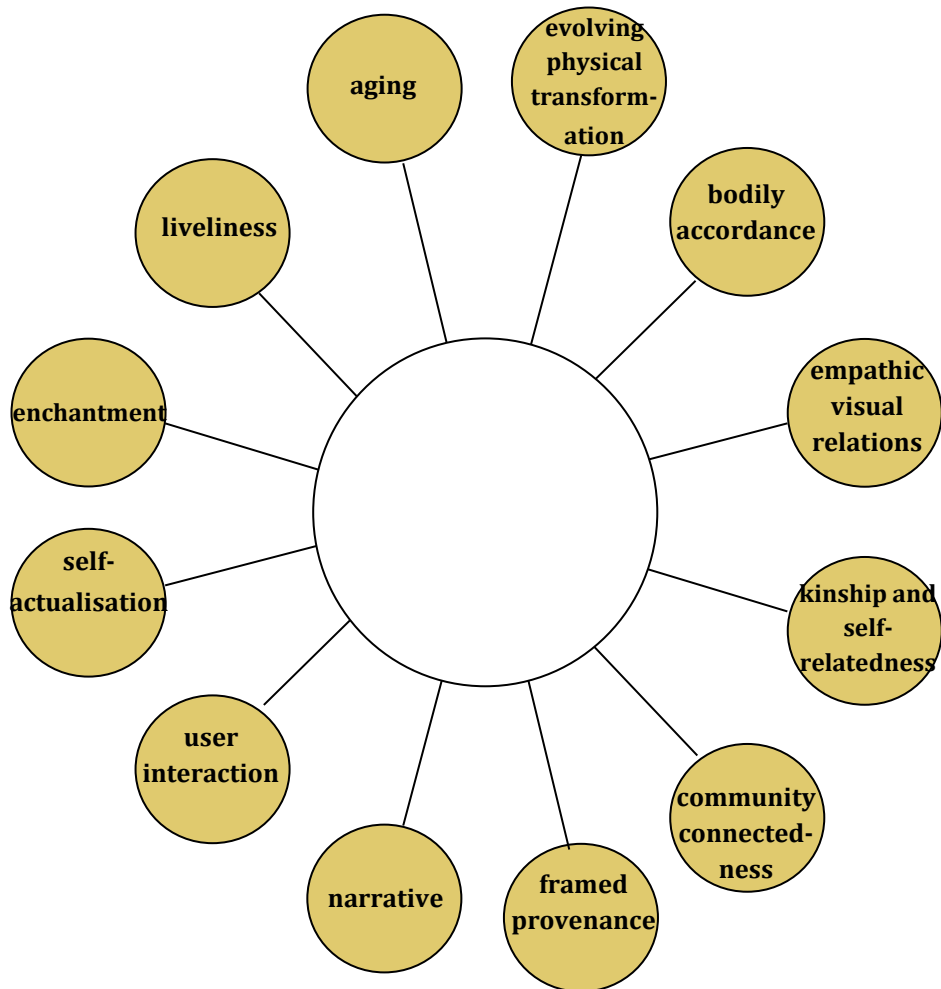


Figure 5-3 Enduring Design Framework of the Twelve Constituent Parts. Forlano, 2018.

5.5 DESIGN FOR BODILY ACCORDANCE

Designing for bodily accordance involves traits intrinsic within the work (without requiring symbolic or cultural interpretation), that emerge from *direct sensory interaction* with the object. They fulfil a mediatory function as an experiential by-product. Particularly relevant to this research is how the form of the artefact can physically accord to bodily movements to seemingly *know* the user, in the way that it conforms easily, moves with the user's movements to provide extreme comfort or is perceived as a perfect fit, and thus feels personalised. The sensorial pleasure and the accumulation of intimacy over time with the artefact increases artefact attachment (Jung

et al. 2011; Schifferstein, Mugge, and Hekkert 2004), and I argue that this can be created within built environment artefacts through bodily accordance.

As theorists of sensory design assert, the machine and modernist aesthetic have largely occluded memory and the full spectrum of the senses (Bachelard 1994; Pallasmaa 2012; Malnar and Vodvarka 2004). Although design practice takes the tactile and ergonomic into consideration, such as the physical contact being pleasurable to touch, it can also consider the ability of artefacts to foster comforting mnemonic experience and be emotive, by virtue of temperature, texture and ergonomics. As Atakan (2014) notes, although not effective for the entire population, individuals who have a non-functional need for touch can develop attachment through “positive haptic stimulation.”

5.5.1 SURFACE AND FORM

Surfaces and forms such as arm rests, head rests, cushions, and table edges provide distinctive opportunities for engagement that provides unique physical and thereby mnemonic comfort. Details such as leather can be sensorially reminiscent of human skin, and soften over time, adapting to the human form. These surfaces and forms can subconsciously evoke the memory of human-to-human comforting actions, such as hand-holding and parent-to-child cradling, for example, with handles that accord to palm of the hand and are warm.

The *Enveloppe Sofa* by Inga Sempe (Figure 5-4), can provide mnemonic comfort by recalling a childhood blanket, soft-toy holding, or evoke the feeling of being hugged by the furniture itself. This artefact extends beyond being merely instrumental or symbolic, and adopts an anthropomorphic and mediative character, shaping human action and adapting to the user. The sofa seems to reciprocate care back to the user in its human-like embrace from the integrated back and wrap around arm.

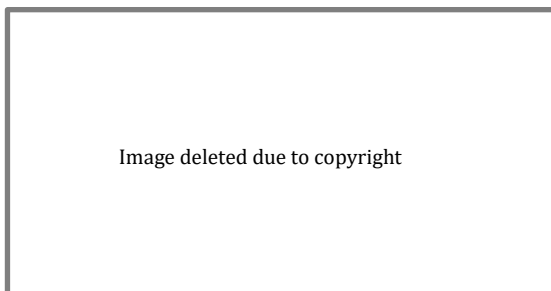


Figure 5-4. Sempe, Inga. *Enveloppe Sofa*, 2008.

Source: Sempe, Inga. Accessed 14 April, 2016, <http://www.ingasempe.fr/enveloppe.html>

The materials and construction may have the capacity to absorb stains and odours, making it difficult for the divestment ritual. However, the ongoing experience of adaptability to give comfort, unlike other comparable sofas, would encourage owner empathy and care for the artefact. This is because objects that give sensorial pleasure can become valued, precious or beloved (Belk 1988; Csikszentmihalyi and Rochberg-Halton 1981).

Surfaces may wear to be perfectly shaped, to be deemed as personalised and perfectly suited to the user. Alternatively, it may be the body that shapes itself to the artifact, like a well-worn ring which leaves a mark on the finger. An “irreplaceable” status, as discussed by Grayson and Schulman (2000) arises once it becomes a tangible, tactile, physical self-extension. Age creates unique surface variety (Pye 1968, 84) that evokes memory and familiarity, which a new equivalent version cannot.

Similarly, the *Smock* chair by Patricia Urquiola is generously shaped to provide comfort that suits different body types, and is wide enough to enable most to sit in the chair in a ‘curled’ up manner. This ability to change position to find an individual’s own comfortable position is also noted by Eero Saarinen (n.d.) as a reason for the “classic” and “timeless” label placed on his *Womb* chair of 1946 (Saarinen, quoted in Feill and Feill 1991, 21).

Urquiola was inspired by her daughter’s dress (Egly-Thompson 2013), with the oversized smocking detail of the leather offering potential recollection of the past; of babies’ christening gowns, girls’ smocked dresses, and seamstress skills, familiar to many. Potentially wide enough for a child and parent, it can also create further positive memories of a nurturing period between family members. Additionally, the ‘skin’ quality of leather and the soft wrapping form evokes a subtle sense of a human skin-like embrace.



Figure 5-5. Urquiola, Patricia. *Smock*, 2005.

Source: Moroso. Accessed 14 March, 2017, <http://moroso.it/famiglia/smock/?lang=en>

Akin to notions of ‘engagement’ (Borgmann 1995), it is the repeated use over time that embeds in memory a uniquely haptic experience that can render the object irreplaceable (Jung et al. 2001, 65). The distinctive tactile quality of a patterned relief in a relative’s tea cup, for example, may act to recall the childhood experience and events related to that teacup and that relative. As Malnar and Vodvarka assert, it is the object in *sensory detail* that is crucial in ensuring the object’s significance (2004, 184).

The importance of addressing the surface by the designers is perhaps reinforced by a surprising result from the survey conducted. It revealed that 95% of respondents seek a ‘beautiful or interesting surface’ in a furniture purchase. These responses highlight the importance of uniquely pleasing surfaces over the mundane or purely practical for furniture, and perhaps reveal an opportunity for designers to consider *enchantment* of the surface not just the form.

The notion of Design for Bodily Accordance, that is, how the body perceives the surface as beautiful or interesting to touch, is explored in my creative practice projects in Chapter 6. Given that a considerable proportion of human communication is via the body (Malandro, Barker and Barker 1989), surface texture and bodily accordance is a valid and significant area for further design testing and research.

5.5.2 MOTION

The *Chinaman's File* rocking chair by Trent Jansen is an exemplar in using bodily movement to evoke memory and emotion. It aims to “simulate the rock[ing] experienced by a baby while being walked by its mother: each rock of the chair is designed to subject the user to the same arc and cadence that a baby experiences during its mother’s single step” (Jansen 2015, paragraph 2). Informed by filmic documentation, the movement aims to evoke “contentment that we have not felt since our infancy” (Ibid.). Despite being inspired as a chair to comfort the Chinese gold rush migrants in a new and alien place (Ibid.), the rocking movement is one that is cross-cultural and intergenerational in meaning, and thus can be equally reminiscent of motherly rocking to render it with an enduring quality.



Figure 5-6. Jansen, Trent. *Chinaman's Chair*, 2004.

Source: Trent Jansen, photography by Scotty Cameron. Accessed: 27 November, 2015, http://broachedcommissions.com/commissions/2013/east/chinamans_file_rocking_chair/index.html

Aspects of the chair, such as the hard seating, back and arms rests may not be of bodily comfort on contact. However, soft accessories can singularise and update the appearance over time if needed, while also protecting the longer-lasting timber component, enabling extended longevity.

In short, bodily accordance can be created through positive emotional and aesthetic sensory experience through direct bodily contact and/or motion.

5.6 DESIGN FOR EMPATHIC VISUAL RELATIONS

Design for Empathic Visual Relations is created through embodying an empathic person-object relationship through the visual and spatial appearance, and is thereby a function of an artefact's visual product language. An example is the *Endless Quilt* (Forlano 2012) project discussed in section 6.1. The work is a series of parts that come together harmoniously to form a whole, symbolically reflecting relational properties of interconnectedness and of the stories graphically expressed.

Rompay and Ludden (2015) argue that 'relational properties' of objects embody characteristics that can in turn influence person-object relationships. Although analysed in relation to electronic products, the principles can be applied to other artefacts. Visual-spatial relationship cues, such as verticality, that is, an object placed up high or towering over others, evokes "dominance, pride, and success" (Ibid., 4); while cues evoking containment, that is, an object expressing visually "restraint... [or] unprotected freedom" and distance may evoke emotional distancing or cosy intimacy (Ibid., 5).

The lounge chair (Figure 5-6) visually evokes relaxation and comfort through its functional role and forms. Through the visual-spatial and empathic cues, the chair expresses support, protection and cosiness without entrapment, and stability through its weightiness and a low centre of gravity. The artefact embodies empathy towards consumers, as if to communicate, here is somewhere to retire, find comfort and relax. These designs stimulate an imaginative 'feeling into' the artefact, allowing the user to anticipate the physical feeling of contact.



Figure 5-7. Eames, Charles and Ray Eames. *Chaise Lounge*, 1956. Forlano, 2017.

5.7 DESIGN FOR KINSHIP AND SELF-RELATEDNESS

Design for Kinship and Self-relatedness focuses on objects that connect the self to a small social and familial grouping, what Heisley and Cours refer to as the 'kinship embedded self' (2007). Kinship qualities can connect the current possessor to significant others, causing singularisation and irreplaceability of the artefact and thereby facilitating psychological endurance.

In response to what was deemed 'special' or an 'heirloom', an archetypal survey response was;

The... family heirloom is a brass and iron bed frame that has been passed [on] through [the] generations...[It] is special because it has a history of my family and it's nice to know it belonged to a relative I never got to meet therefore sustaining a form of connection to [that] relative ... (Survey respondent #17, 18-34 year-old, female, art/design professional, 2016).

Bequeathing of artefacts which reflect nurturing, contemplation and positive family interaction is strongest in women (Csikszentmihalyi and Rochberg-Halton 1981, 118 and 142; Dittmar 1992, 141). Men on the other hand, are more likely to consider 'action' objects worthy of bequeathment (Csikszentmihalyi and Rochberg-Halton 1981, 106; Dittmar 1992, 141). Action objects refer to "self-control through unique acts" (Csikszentmihalyi and Rochberg-Halton 1981, 96), and tend to exclude furniture or built environment artefacts, but include items such as vehicles, TVs, sporting and other equipment (Ibid. 106). These findings were reflected in the survey (Table 5-4) and interviews. This reinforces the literature review findings, that domestic objects are not merely functional, status defining or fashionable things; domestic artefacts are ascribed a depth of meaning deemed special and worth passing on to others.

Table 5-4. Survey responses regarding variations in bequeathment attitudes between males and females, 2017. Forlano, 2017.

Personal items	75%	47%
Furniture	45%	42%
Domestic other than furniture	41%	21%
Leisure (action) objects	8%	21%
Nothing	9%	16%

When considering the design of built environment artefacts, including the personal and the kinship-embedded self in the design of domestic and “contemplative artefacts” (Ibid., 96), can heighten the opportunity for bequeathing and custodial practices, particularly for women, and has been underexplored by designers of built environment artefacts. Therefore, my creative research efforts have concentrated on how to explore and embody this highly personalised and kinship form of relatedness, and the type of process needed. I explain this in detail in Chapter 6.

In consumer society, built environment artefacts such as furniture are used in social family transactions, such as family dinners and significant events, thereby becoming associated with authentic social experience. Objects forming part of social activities can thereby become more imbued with the memory of events (Heisley and Cours 2007). It is the designer’s challenge to create artefacts that become significant during these experiences.

Karanika and Hogg (2012) state that there are four typical trajectory models of object closeness over time. Of the four trajectories, the authors’ ‘rising maturity’ model is the person-object relationship type that endures beyond others. They identify ‘affiliation-related’ objects as increasing value over time “reflecting the gradual building up and accretion of meanings to the possession” to the extent that “respondents experience such possessions as irreplaceable” (Ibid., 6). The affiliation group is predominantly with family and close social others, reinforcing the significance of the artefact’s role as ‘standing in’ or as evidence of ties to social others, or in Maslow’s term of ‘belongingness’.

If objects form part of family identity rituals (Epp and Price 2008) then the objects more likely gain significance for multiple family members, and hence not only minimise risk of loss of the object’s significance to the future heirs, but in fact build upon and strengthen the personal and familial meaning amongst many. This increases the likelihood of a future custodian.

Although designers cannot fully control artefact meaning, designers can encourage ritual and embedding of kinship stories that strengthen the likelihood of mental, physical and emotional engagement. Belongingness can be reinforced through artefact ownership that expresses group inclusion and/or role.

5.8 DESIGN FOR COMMUNITY CONNECTEDNESS

Design for community connectedness creates direct connections to place and people, through material selection and fabrication techniques that are incontestable evidence of the social connectedness, such as a place visited, or a maker met. For example, it is likely that neither an object that is symbolically similar, nor a replica from another maker, could ever maintain the value and emotional endurance or connection to place and people that the original can achieve.

Designed artefacts can incorporate design approaches for emotional connection, including connection to a more 'distant' other (that is outside self-relatedness or kinship), such as our natural environment or a culture. Highly processed or artificial appearing materials, such as plastics, often with 'perfect' surfaces, evoke little connection to environment, place, and the community of makers. The object appears vapid and upon damage to its perfectly artificial surface, becomes identified as broken, irreparable. Without a feeling of connection, artefacts can be guiltlessly disposed of.

In the attempt to create objects for all, the anonymity of many mass-produced goods has resulted in objects stripped of telling signs of their history. I maintain that the *evidential*, (not just the semiotic meaning within artefacts), contributes to social connectedness, which builds enduring qualities. Works that enable a richer or ongoing relational engagement stimulate a longer-term understanding and enriched POR, as reinforced by survey responses and interviews, for example, with the aforementioned meat safe.

Figures 5-7 to 5-10 show a furniture design and manufacturing company, *Koskela* collaborating with the *Echo Island (Yolngu)* weavers, to make furniture elements and lighting with cultural and place relatedness through natural, local materials and traditional techniques, displaying evidence of hand-making and one-off production. The works have both a semiotic and evidential function. They connect to personally known or unknown others and place.



Figure 5-8. Koskela and Yolngu weavers. *Yuta Badayala* lamp shade, 2015.

Source: Koskela. Accessed 14 March, 2017, <https://www.instagram.com/koskela>



Figure 5-9. Koskela. *Yolngu weaver*, n.d.

Source: Koskela. Accessed 14 March, 2017. <https://www.instagram.com/koskela>



Figure 5-10. Koskela. *Yolngu weavers*, n.d.

Source: Koskela. Accessed 14 March, 2017. <https://www.instagram.com/koskela>



Figure 5-11. Koskela. *Koskela staff and Yolngu weaver* n.d.

Source: Koskela. Accessed 14 March, 2017. <https://www.instagram.com/koskela>

An interviewee described his desire for collecting artefacts from his home country, Australia:

Fred: ... a lot of us don't really know... where we've really come from... and some of this [artefact collecting] is trying to... feel a connection. (2016).

Furthermore, this work also embodies human values such as honesty, authenticity and simplicity, and simultaneously evokes contemplation about time and effort in the making, typical of emotionally enduring objects. The heirloom is not only “to weave...my means of narrative, a significance of blood relation” (Stewart 1993, 137) but equally, it is the authentic connection to the ‘real’ thing (Grayson and Shulman 2000), the ‘evidential function’ in the material form; that is, the event, place or person.

Authenticity and irreplaceability are also inextricably linked. In contrast, the inauthentic object highlights our lack of connection, a sense of loss, and can, by extension, be a “symbolic death of the self” (Ferraro, Escalas, and Bettman 2010, 169). As Belk notes, possessors “insist that inauthentic, faked or forged objects, cannot possibly contain the powerful memories of the real thing” (Belk 1990, 671). Ownership of artefacts linked to significant memories verify the past, and without those artefacts it as if the link has been severed or reduced (Grayson and Shulman 2000, 21). Thus, embedding opportunities for connectedness to the makers or place, encourages endurance.

5.9 DESIGN FOR FRAMED PROVENANCE

Design for Framed Provenance can facilitate a person-object relationship based on understanding the object’s provenance, that is, its coming-into-being through extrinsic framing. Artefacts purchased from the studio of a designer-craftsperson may allow the consumer to engage with the maker, their labour, the place it was made, or the origins of the material and its transformation, and the consumer becomes informed of its provenance and the artefact’s social life.

I refer to provenance here as the factual history of the object (in terms of the idea, maker, designer, materials and history) whether a singular object or a reproduced series. *Object framing*²⁴ is the phenomenon identified by anthropologist Daniel Miller (2010) that gives an artwork (but this is equally applicable to built environment artefacts) a biographical, historical, cultural or material *frame* through which to understand it, regardless of the instrumental, visual appearance or trend status. Provenance can be intrinsic, as seen in the last example by *Koskela* and the *Yolngu* weavers. The provenance can be traced directly through the materiality of the artefact itself. The provenance is thus always recoverable or visible within the artefact.

However, designers have underexplored the *extrinsic* opportunity to frame the artefact provenance to create another layer of understanding and connection to incite care. For example, as with the bowls by *Koskela* and the *Yolngu* weavers, a certificate of authenticity or photographs documenting the making process gives evidence of provenance but is an external to the artefact itself. It may be lost, misplaced or difficult to recover, compared to its intrinsic qualities.

²⁴ Based on Goffman’s *Frame Analysis* (Goffman 1974).

Evidence of human labour, place of production and object singularity is hidden beneath the identical packaging, artificial surfaces and mechanised production of mass-produced objects. Individuals do not come to know the designing, making process, nor production location of their domestic mass-produced artefacts as they once did prior to the Industrial Revolution. The human labour invested is largely invisible; the artefact is perceived as common, devoid of 'character', and has no sign of its coming-into-being.

Framing is the social meaning attributed to an artefact through systems such as the item's cost, its imbued meaning by the design elite through museum collections and publications, and signs of authenticity such as brand identification, among others. It singularises the artefact, even when mass-produced, by imbuing it with greater importance that is verified within the framing system.

All objects have a genealogy (Cherrier 2014) that, if traced, can track historical associations and interactions with others throughout its making and distribution (Gell, 1998; Latour, 2005). However, not all possessors have an ability to 'read' the object meaning's (Parsons 2009, 8-9), provenance, rarity, authenticity or other valuable qualities, even if it is self-evident to others.

An authorised production and the exact replica of the same design are not treated in the same manner, due to the consumer's perception and framing of the artefact. A *Herman Miller*²⁵ produced version of the 'DCW' Eames chair would likely be retained and possibly restored due to its provenance, if it is framed, as the chair has been, through the design media, historians, and the manufacturer. A manufacturer's label or certificate allows the consumer to identify it as being special or important. It is often not the object itself but the extrinsic framing that creates meaning.

An absolute equivalent with no verification of provenance would likely be deemed a replica that is not worth repairing and is easily replaceable. Yet the unverified may meet industry's and consumer's conventional view of aesthetic timelessness and Schiermer's (2016) notions of the classic.

Some may argue that quality of construction is identifier enough of a more enduring quality; however, in terms of today's low-cost production methods, quality in some artefacts is extremely hard to differentiate, particularly by the layperson. This highlights

²⁵ A highly reputable and well established leading furniture maker.

the need to view the *evidentiary* function as an essential and legitimate component of artefact endurance. Despite the fact it may sit outside conventional understanding of a designer's role, the provision of evidential intrinsic qualities as well as extrinsic framing qualities is needed.

The survey quote below from a design professional shows the variety of reasons why her two chairs are deemed enduring and alludes to the framing phenomena. The chairs are characterised by multiple enduring qualities: emotional experiences, in this instance signifying the height of personal achievement in her design career, in line with Maslow's esteem and actualisation needs, and Csikszentmihalyi's 'action' objects; memories of a significant past; but significantly it also demonstrates the author's connoisseurship and evidence of the past.

The chairs are also cited as historically significant, and the surface finish is no longer in production, thereby making it difficult to replace. In this example it is the combination of the artefact's framed provenance and the individual's narrative that make the artefact significant. The survey respondent writes:

I have two rosewood veneer [E]ames chairs that ceased production by Knoll in 1986. I would want to pass these onto my daughter. I purchased them at the height of my design career from a wonderful furniture showroom called Artes Studio in Melbourne — it no longer exists. The chairs are sentimental of that period, the people I knew, [and] the circumstances that enabled the purchase of the chairs. They are also representative of one of my favourite design periods when some designers were making dramatic changes to the way we use furniture [in] the 1940-1950s. (Survey respondent, #5. 55-64 year-old, female, art/design professional, 2016)

The chairs could be perceived as the best available quality, overseen by the actual designer from decades past, due to being fabricated by the licensed manufacturer. This assures the possessor of their intrinsic material quality and serves to reinforce her link with a great personal achievement and to a celebrated and prominent designer. The chair is imbued with various social connections, is deemed worthy of bequeathing for its personal, social, aesthetic and actualisation qualities. This is largely grounded in its framed provenance.

It is important to note, however, that not all objects will be designed by revered historical figures or form a narrative in design history. Designers can however look to create authenticity and uniqueness or communicate the object's provenance or history *within*

the object so it is not lost. Alternatively, they can engage in external means to frame the artefact.

Akin to the aforementioned work of *Pamono*, the internet provides a resource to digitally archive the provenance and history of objects in a way that was previously unavailable to designers. The internet and social media also provides opportunities for the design industry to imbue objects with immaterial qualities through authentication, storytelling, provenance, and aficionado-appeal, to encourage custodian-like behaviours.

Contextualising the artefact's provenance through cultural institutions via awards, art or design museum collections and the like, can also frame the object as significant. Connoisseurs of artefacts typically appreciate and demonstrate artefact empathy through their understanding and unique knowledge, and translate to object care by retaining, restoring, or passing on the knowledge and artefact to others.

It is noteworthy, however, that this knowledge must be passed down to future generations or onto others such as a dealer by some means; for example, through a certificate of authenticity or a manufacture's stamp that provides evidence of its provenance to encourage endurance.

The objects of mass production are often stripped of evidential aspects of their history and making, and consequently have an untraceable provenance for the consumer. In this scenario, meaning is predominantly socially constructed and volatile. Advertising, collective stories and public attitudes can then easily shift personal outlook toward things²⁶. The unverifiable, impersonal artefact's meaning shifts easily from fashionable to outdated, successful to unsuccessful or exclusive and luxurious to common and ordinary. Communication of verifiable provenance can however, valorise and re-valorise artefacts.

TOG Furniture, for example, acts as a marketplace for furniture which can be or has been customised by artists or designers to create limited edition or one-off versions from anywhere in the world. The process of fabrication is revealed. The website includes short biographies of the designers, makers and artists, and allows consumers to converse directly with specific individuals about the design which is available to consumers, enabling transparency of the artefact's provenance and a social connection.

²⁶ Additionally, extrinsic framing of provenance can be misused with misleading or false claims leading to ethical issues. While this aspect is worthy of discussion, it is beyond the limits of this exegesis and would be worthy of further study.

The experience is further framed by having a ‘star’ designer, Philippe Starck, as designer and co-founder, and the ability to appoint an artist to customise artefacts. The site allows for maximum customisation through commissioning artists to adapt any product in the range (Figure 5-12) from a standard design (Figure 5-12), (E-Biscus 2016), as will be discussed further in section 5.11.²⁷

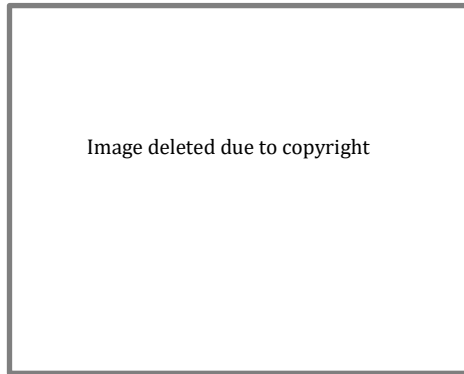


Figure 5-12. Amore, Carlotta Modica & Matteo Orland. *Variant of Vodo Masko*, 2016.

Source: TOG. Accessed 14 March, 2017, <http://www.togallcreatorstogether.com/>

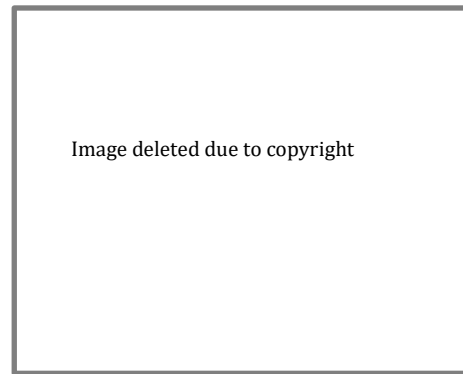


Figure 5-13. Maggiar, Ambrosie. Original (non-customised) design of *Vodo Masko* table and chair set, 2014.

Source: TOG. Accessed 14 March, 2017, <https://www.architonic.com/en/product/tog-vodo-masko/1268256>

Not all consumers will be connoisseurs of artefacts. Consequently, it will often be up to designers to consider how to extend the cared-for lifespan of an object, including it being valued beyond one consumer inter-generationally through *framing*.

5.10 DESIGN FOR NARRATIVE

Design for Narrative explores the *imagined* or informal and *unverifiable* stories, either intrinsic or extrinsic. While framed provenance has its basis in providing factual knowledge of object provenance, narrative tells a social life story about the artefact itself or something external to itself, but which it is associated with. Imagined narrative and provenance can be viewed as a continuum but are worth separating for the design potential they present at both extremes.

²⁷ "TOG provides the consumers... with the perfectly designed "naked" products, mass-produced in Italy, yet enables them to personalise the products if they wish... a do-it-yourself concept in order to foster uniqueness leaving it to the customer's fantasy and creativity. An even further step is selecting a *customiser* from a network of creatives around the world for a bespoke commission." <http://www.togallcreatorstogether.com/whats-tog-2/> accessed 23 November 2016.

Narrative can emerge from real yet unverifiable experience or imagined stories. As evidenced in this survey respondent's thoughts about a phone chair she inherited from her grandmother:

[She] used to sit and call her neighbour every day, twitching the curtains to "surreptitiously" watch what was happening in the street as they gossiped and chatted. [The telephone table] reminds me of friendship and laughter. (Survey respondent, #15, 35-54 year-old, female, non-art/design professional, 2016).

Narrative can also occur as stories of experiences recited to others:

I love hearing the stories from the sellers... A set of drawers we purchased for my daughter came with a 100 year history. (Survey respondent, #37, 35-54 year-old, female, art/design professional, 2016)

Objects of instant gratification leave us "empty and dissatisfied" in the longer term (Kasser 2003, Csikszentmihalyi 2014). However, artefacts offering active engagement and *flow* through contemplation, narrative and interaction enhance well-being and happiness (Borgmann 1995; Csikszentmihalyi 2014), thereby instilling a desire to keep the artefact.

An exemplar of the narrative approach applied extrinsically to the material artefact is in Glenn and Walker's work, *Significant Objects* (2012) which was a 'literary and economic experiment' that gave very low cost and neglected objects from a second-hand retailer an invented history and tested their demand and monetary value. The artefacts were not only reappropriated, thus giving the object an extended life, but their sale price increased substantially when associated with a narrative (Figure 5-13 and Figure 5-15).

The *Significant Objects* (2012) project demonstrates how objects once imbued with a social life through narrative gain a new role in people's lives. What is notable is that the participants were aware these stories were invented and yet the story still increased the artefact's lifespan. In fact, as purchasing the object was part of this experimental project, the object also gained a new factual biography by being part of the experiment, which was reinforced by being documented online.



Figure 5-14. n.a. *Object 10. Duck Nutcracker*, n.d.

Source: Significant Objects. Accessed 14 March, 2017, <http://significantobjects.com/2009/12/14/duck-nutcracker/>



Figure 5-15. Koestembaum, Wayne. *Object 10. Duck Nutcracker description and commencement of imagined narrative*, 2009.

Source: Significant Objects. Accessed 14 March, 2017, <http://significantobjects.com/2009/12/14/duck-nutcracker/>

Narrative can also be implied intrinsically through the object's materiality to encourage consumers to imagine the narrative. As this is a lesser explored approach by the design industry, many of my creative works have explored this to demonstrate how this may manifest in design. *Endless Quilt*, *The Unforgotten*, *Marri-Kingia Past* works, and *For Now, For All-ways* explore this narrative intrinsically through an illustrative surface. This is further explained in Chapter 6.

A key consideration in object endurance is reappropriation. To engage others, the narrative should be directly transferable through story-telling, or indirectly through an ambiguity or curiosity that stimulates what Gregson and Crewe term, *imagined history making* (2003, 147). By enabling a continuation of the narrative across generations in this lively way, the artefact *collects memories*.

5.11 DESIGN FOR USER INTERACTION

Design for Interaction encompasses interacting through use, at one end of the spectrum, to a more immersive co-design enabling creative expression and skill at the other end. Largely generated through a reflection on my own and others' creative practice, I have identified various ways designers can encourage interaction and the outcomes from this interaction, and these are summarised in the table below.

Table 5-5. Designing for various degrees of interaction. Forlano, 2017.

Interaction types	Potential Outcome				
	Change of use	Change of forms	Change of aesthetics/ surface	Develop new skills, creative expression	Enable contemplation and self-actualisation
Design for performative interaction		X	X		
Design for evolving interaction through use	X	X			
Design for interaction through making	X	X	X		
Design for evolving aesthetic transformation			X	X	
Design to co-design to enable creativity or skill	X	X	X	X	X

Low level interactions such as post-fabrication, surface personalisation of appearance has been shown to increase attachment (Mugge, Schoormans, and Schifferstein 2009) while more engaging and varied personalisation through co-design pre-fabrication can elicit a greater sense of value in the possessor through a feeling of accomplishment not otherwise possible (Maclachlan, Harrison, and Wood 2011; Teichmann, Scholl-Grissemann, and Stokburger-Sauer 2016). Design for emotional endurance through user interaction or “user interface design” is extensively discussed in relation to electronic objects; it is lesser explored within non-electronic artefacts or elements of the built environment. I will now articulate these four types of interactions and their outcomes.

5.11.1 DESIGN FOR PERFORMATIVE INTERACTION

Design for Interaction can occur through a performative or sensory experience for the user. This was instinctively developed through the creative production process for the suite of community artefacts, as these components of the built environment are not able to be interacted with, in the same way as furniture can be. Surfaces of buildings are typically static and unable to be held, controlled or manipulated by the user.

Kaleidoscopic Wave explores how surfaces can become visually performative through mirrored surfaces; the façade patterning for *Pugin’s Trellis of Marri-Kingia Creatures* demonstrates how surface illustrations can trigger memory and evoke sensations associated with noises and the feeling of crawling bugs to indirectly interact with the user and how spatial interaction can enable the surface to *act* on the viewer through revealing detail over time. This is further discussed in chapter 6.

5.11.2 EVOLVING INTERACTION THROUGH USE

By encouraging conscious interaction with the artefact, the possessor is more likely to view the object as special, irreplaceable, and layered with multiple associations (Csikszentmihalyi and Rochberg-Halton 1981; Chapman 2005; Curasi, Price and Arnould 2004; Wallendorf and Arnould 1988, 541).

This reinforces Ingold's suggestion for designing for an open future use (2011). Ingold argues that designing for environments and sustainability should be an open-ended process "that do not begin here and end there, but *carry on through*" (Gatt and Ingold 2003, 146), engaging the user.

Multi-functional and adaptable furniture and built environment artefacts that form a particular role in important rituals can maintain this ongoing interaction through use over time.

Artefacts can also become imbued with self-identity (Belk 1988; McCracken 1986). By "appropriating or controlling an object for our own personal use... [we] exercise power over" the artefact and by creating it and knowing it thoroughly (Belk 2004,91) an artefact can *become* part of the self (Belk 2004, Sartre 1943). By becoming part of the self, an enduring relationship has the potential to emerge.

As such, in my creative practice I have explored this through DIY assembly and reconfigurable elements in the *For Now, For All-ways* product. I have incorporated opportunities for ongoing varied arrangements and the ability to add existing components through modularity and rearrangeable parts, in the *Endless Quilt, En-case* and *For Now, For All-ways*, as described in Chapter 6.

As a precedent however, the *606 Universal Shelving System* below is perhaps the most famous and long-lasting, exploiting the potential of a kit of parts system. Designed in 1960, and in constant production since (Vitsoe 2016), it is multi-functional, self-evident in its assembly, and produced in components physically small enough to be easily relocated. It is simple to adapt to various functions, spaces and spatial typographies (Figure 5-16 to Figure 5-20) thus maximising the opportunities for user interaction over time. This product demonstrates how a focus on evolving user needs and interaction can indeed contribute to an enduring design.

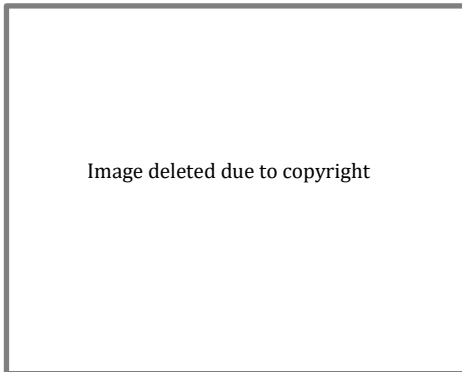


Figure 5-16. Rams, Dieter. *606 Universal Shelving System*, 1960.
Source: Vitsoe. Accessed 14 March, 2017, <https://www.vitsoe.com>

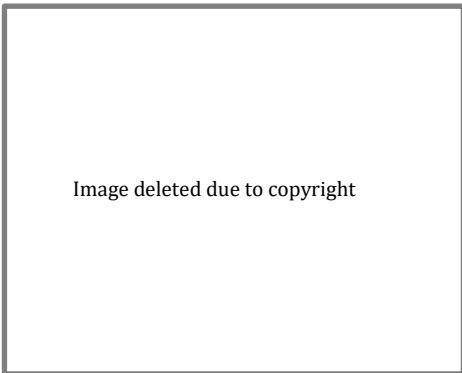


Figure 5-17. Rams, Dieter. *606 Universal Shelving System*, 1960.
Source: Vitsoe. Accessed 14 March, 2017, <https://www.vitsoe.com/rw/606/gallery/kitchen>

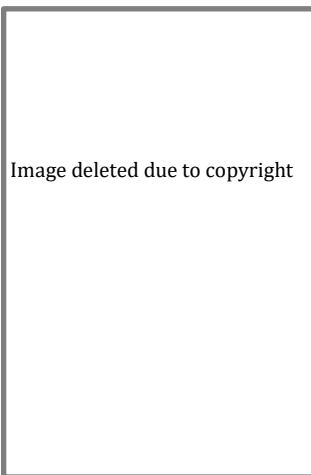


Figure 5-18. Rams, Dieter. *606 Universal Shelving System*, (office context) 1960.
Source: Pinterest. Accessed 14 March, 2017, <https://au.pinterest.com/pin/328270260322575014/>



Figure 5-19. Rams, Dieter. *606 Universal Shelving System*, (kitchen context) 1960.
Source: Pinterest. Accessed 14 March, 2017, <https://au.pinterest.com/vitsoe/>

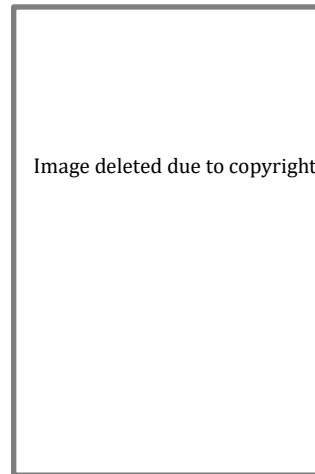


Figure 5-20. Rams, Dieter. *606 Universal Shelving System*, (residential living room context) 1960.
Source: Dwell. Accessed 14 March, 2017, <https://www.dwell.com/product/article>

Furthermore, the *606 Universal Shelving System* also reflects other Enduring Design Framework principles I have raised, rather than purely relying on its instrumental function. The *606 Shelving System* also contains an evidential function relating to status and esteem, due to its framed provenance. It has become an iconic furniture piece reinforced through the design industry media because the designer, Dieter Rams, is highly regarded and it is represented in numerous exhibitions, books and collections, including the *Museum of Modern Art*, New York. Thus, owning it, becomes evidence of connoisseurship.

While the aesthetics may be perceived as alienating in light of my earlier argument, it is successful in this context, because its visual discreteness allows the user to instil the identity *onto* the artefact through use, and by what is displayed on the artefact. In this way it differs from many designs that are in a sense fully controlled by the designer. In use, this artefact becomes a visual backdrop. A “silent performer” as product designers would term it, (Park 2010, 88), in contrast to imposing a design style onto the possessor. Figure 5-18 to Figure 5-21 show how the product is used and the ease of assembly. Designers should ensure that if the constituent materials in its ‘object’ form are no longer wanted, it is possible to design for physical transformation, including concepts such as ‘transparent design’, circular economy, *takeback* schemes and the like.²⁸

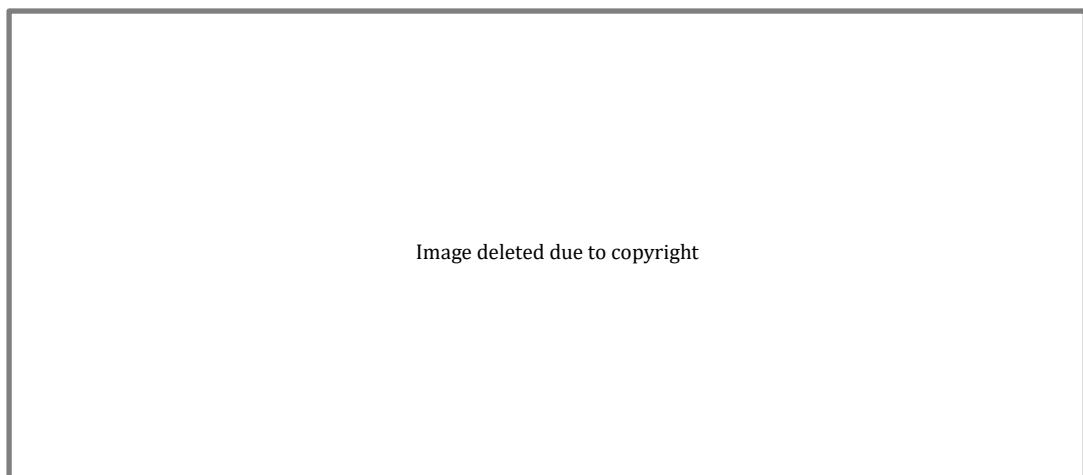


Figure 5-21. Rams, Dieter. *606 Universal Shelving System*, 1960.

Source: Vitsoe. Accessed 14 March, 2017<https://www.vitsoe.com/rw/606/how-it-works>

²⁸ Methods are extensively covered in ESD literature (Bakker et al. 2014; Chapman 2017; Datschefski 2001; Spring and Araujo 2016; Walker 2006b)

5.11.3 INTERACTION THROUGH MAKING

The value of designing to enable making opportunities lies in the ability to capture the *evidence* of one's own or significant others' time, effort and energy invested. This creates the possibility for the artefact to be imbued with traces of the maker. It is not only the visual interpretation, nor the instrumentality of the works that make artefacts enduring. It is the by-product of the making that forms tangible links between the maker and the user (Pye 1968, 83). This evidential embodiment within the artefact strengthens the artefact meaning and value, and encourages an enduring person-object relationship. As Forlano and Smith state, "making with one's hands involves even greater personal engagement. Investment is not only visual and intellectual but also bodily and kinaesthetic, as the material is manipulated and refined to become the object" (2012, 1).

Personalisation by the possessor enables a lengthened experience of acquisition in lieu of an easy, quick purchase, as endorsed by the Slow Movement (Fuad-Luke 2010; Strauss and Fuad-Luke 2008) and Manzini (2007). As Verbeek concludes "if products are to be designed to encourage attachment, it is necessary to design them so that humans deal with the product *themselves* and not only with what they do or signify" (Verbeek 2005, 323).

Customisation gives rise to its increased perceived value where there is sufficient opportunity to self-design to meet personal preferences (Franke, Schreier, and Kaiser 2010, 127-128). Importantly, the increased level of customisation and personal input increases opportunities for engagement and emotional endurance. While the assembling of a pre-determined outcome such as an IKEA DIY product may generate very limited to no engagement, greater opportunities for personalised modification such as offered by *IKEA Hack*²⁹ can generate potentially more meaningful engagement.

Artefacts that engage the consumer to invest time and effort into an artefact, such as maintenance, (Jung et al. 2011) co-creation, or other forms of interaction, can elevate the artefact's significance as the consumer singularises (Kopytoff 1986) and "ascri[bes]... rarity to that object" (Jung et. al. 2011, 65). This is reaffirmed by the interviewee quoted on page 51 and the following survey respondent's remarks about their most precious possessions either made by themselves or an immediate family member:

²⁹ *IKEA Hack* is a movement that informs consumers of ways to personalise and modify mass-produced *IKEA* products.

[A] custom made lounge. Designed and built [by] myself out of quality materials.. (Survey respondent #19, 35-54 year-old, male, art/design professional, 2016).

Jarraah dining table made by my husband from the wood reclaimed from our first house. (Survey respondent #83; 18-34 years-old, female, non-design/art professional, 2016).

5.11.4 EVOLVING AESTHETIC TRANSFORMATION

Designing for evolving aesthetic transformation may be subtler yet still effective, through consumer choices of available options offered by manufacturers. Personal customisation to change the visual aesthetics to express personal taste preferences has been shown to build perceived value and sense of self embodied in the artefact (Franke and Schreier 2010).

Customisable furniture such as *Ola Chic* by Philippe Starck (Figure 5-22) has optional cushions and arm rests, in standard finishes or fully customised, one-off finishes, created by appointed artists or designers. Most significant about this work is that the components most likely to be damaged or worn over time can easily be replaced or removed without specialised tools or skills, thereby minimising costs, and increasing the likelihood of repair and maintenance.

The customised parts (including table inserts, cushions and customised shrouds, as seen in Figure 5-23) allow for unlimited aesthetic choices (TOG 2017b), while the main, physically lasting component is what Schiermer would likely say has few 'points of attack' (2016), thereby being a classic form when uncovered. The customisable parts are akin to accessories, enabling individual aesthetics and personalisation, while the structural parts are physically long-lasting, thus supporting intergenerational use.

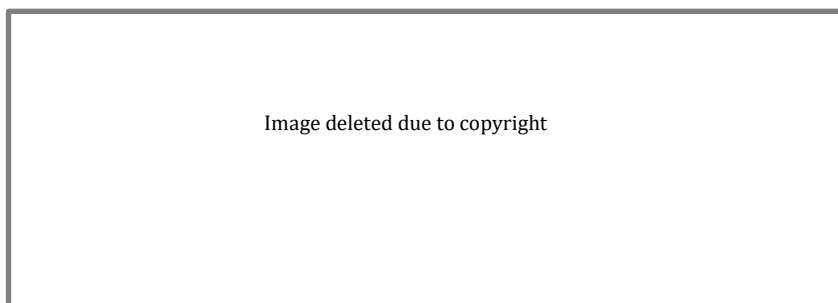


Figure 5-22. Starck, Philippe. *Ola Chic* (chair and sofa), 2014.

Source: TOG. Accessed 14 March, 2017, <http://www.togallcreatorstogether.com/collections/families/ola-chic/>

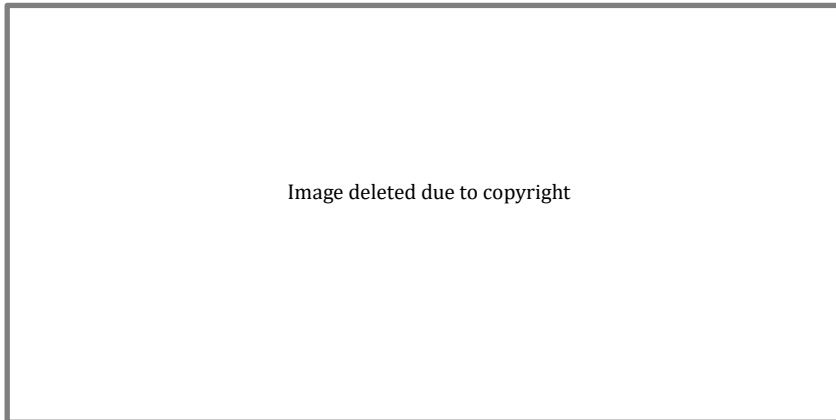


Figure 5-23. Starck, Philippe. *Ola Chic (chair with cover)*, 2014.

Source: TOG. Accessed 14 March, 2017, <http://www.togallcreatorstogether.com/collections/families/ola-chic/>

The marketing campaign, the association with a celebrated designer in Starck, and the emphasis on quality production and provenance, further enhance the potential longevity of the furniture by simultaneously demonstrating the Design for Framed Provenance principle strongly.

5.11.5 CO-DESIGN TO ENABLE CREATIVITY OR SKILL

Design for co-design, that enables someone to reach their full potential through skills or creativity, is somewhat rare in furniture and particularly in fixed built environment design. Co-creation can contribute to a meaningful ‘engagement’ and addresses multiple well-being factors (Fuad-Luke 2007, 32-38), including Maslow’s esteem and self-actualisation motivations for the user. The growth of interest in craft workshops, personal co-creation and self-made goods demonstrates user’s needs or desires to express their own creativity and skills in contemporary consumer culture (Kotler 1986, para. 36).

If the consumption process can enable the user to develop new or hone existing skills, or reveal creativity of a high and desired level, the artefact can become the evidence and reminder of one’s achievement and drive toward self-actualisation. As noted in Franke, Schreier and Kaiser’s study even “short and virtual design processes evoked ... strong emotions [and the works contained a] spirit... [due to the] *I designed it myself* [accomplishment] motive” (2010, 129).

Comprehensive analysis and discussion of the varieties of co-creation are various and explored by other designers and theorists (Fuad-Luke 2007; Greenbaum and Loi 2012, Lee 2008; Prahalad and Ramaswamy 2004; Sanders and Stappers 2008) but rarely specifically in the field of the built environment. Digital mass customisation tools have opened this area of discussion, but it is still a relatively new area.

As such, I have sought to explore this creatively to reveal new ways of using digital fabrication tools and consider how online platforms can enable greater opportunity, not only for user co-design, but also for personalised narrative from the user, to become the instigator of designs. This resultant co-design process captures taste and aesthetics, as well as meaning and contemplation.

An online platform for potential aesthetic and spatial customisations enables the owner to be mentally and emotionally invested into the artefact design. Extensive opportunities for user choice through colour, dimensions, materiality, composition and arrangements maximises the co-creation investment. Customised engravings and digital printing in the final projects, *En-case* and *For Now, For All-ways* offers the most intensive and meaningful engagement through narrative opportunities. The engravings and printing can be uploaded by the co-creator to offer unlimited aesthetic personalisation (see section 6.4) while simultaneously contributing to the semiotic and evidential meaning and creativity of selecting and combining a range of surfaces.

Consumers that are able to co-create an artefact through sufficiently variable mass customisation tools can express creativity, develop skills, and feel a creative accomplishment and enjoyment that they couldn't achieve otherwise (Franke and Schreier 2010; Franke, Schreier, and Kaiser 2010). Co-creators then believe this accomplishment is embodied in the artefact and holds special value (2010).

Co-design has the potential to be more immersive than merely interacting through user or making. Although artefacts can encourage creativity, as discussed by Lidwell et. al. (2003, 124), they can go further, enabling users' self-actualisation, to achieve beyond what was previously thought possible, and allowing one to feel a critical contribution to the work's coming-into-being. By doing this, the extended-self becomes embodied within the artefact, resulting in a potentially enduring person-object relationship (Belk 1988).

Walker's example of a prayer mat (Walker 2011b), illustrates the enduring nature of functionally religious artefacts; that is, artefacts that enable Maslow's highest needs of self-actualisation through the spiritual. However, religious artefacts or tools and places of worship are typically institutionally bound, and outside the designer's control. As artefacts embodying spiritual values, these artefacts do however illustrate a person-object relationship bound in contemplation and values, which can become enduring. Furthermore effort, enjoyment, and a final outcome that is pleasing to the creator (Franke and Schreier 2010) also contribute to the contemplative nature of the artefact and thereby its endurance.

Enjoyment of the co-creation process is important, as frustration (Valenzuela, Dhar, and Zettelmeyer 2009), stress (Moreau and Herd 2009), or too many options without guidance, cause confusion (Huffman and Kahn 1998; Miceli, Ricotta, and Costabile 2007, Piller, Schubert, Koch, and Möslein 2005; Valenzuela, Dhar, and Zettelmeyer 2009), and thus negate positive attachment opportunities.

Researchers such as Franke, Schreier and Kaiser (2010) and others haven't explicitly linked customisation to Maslow's self-actualisation needs. However, consumer behaviour research findings on the increased perceived value of products through accomplishment, enjoyment, and a reflection of the personal would be consistent with Maslow's theory of needs to the level of 'esteem'. If an artefact embodies values, spiritual meaning, or achievement beyond one's previously imagined capabilities, then it potentially leads to contemplation, and embody Maslow's self-actualisation.

Although the value of creative accomplishments embodied within artefacts has been recently researched, actual visual examples were difficult to find. Additionally, what is personally meaningful to one through co-creation, reaching one's full potential, or self-actualisation, would not necessarily communicate self-actualisation to others as it is embedded in its evidence, not the visual outcome. The way in which artefacts can reflect self-actualisation through co-creation is an area worthy of further research.

5.12 DESIGN FOR SELF-ACTUALISATION

To design for self-actualisation is to create an artefact that is mnemonic or instrumental to reaching higher needs. A mnemonic form can be achieved through designing artefacts that visually evoke spiritual or emotional virtues such as honesty, simplicity, integrity, and balance of strength with vulnerability, pride with humility. An instrumental form can be a religious or awe-inspiring artefact.

A religious artefact can enable self-actualisation, however the functional role of the built environment artefact is rarely the choice of the designer, as previously discussed. Like the aforementioned prayer mat, one of Walker's three classifications of enduring objects includes the 'inspirational/spiritual' which is similar but differs from this. Walker's artefact types in his category are limited to "religious statuary and icons, and fine art objects...that refer to or convey the inspiring, sacred or spiritual ideas" (Walker 2006b, 40), based on research of museum artefacts (Walker 2006a, 21). However, I take a broader interpretation of how Maslow's self-actualisation may inform the design of the enduring, and here focus on the semiotic and mnemonic approach of reminding one of higher goals and values associated with self-actualisation.

Maslow's theory is based upon the notion that once basic needs, such as physiological maintenance, safety, belongingness, love, respect, and self-esteem are met, humans then are primarily motivated toward self-actualisation (Maslow 1968, 31). He defines actualisation as the dynamic process, ongoing in life, that enables one toward meeting their full potential, thus fulfilling a call, not a temporary or ego-filled state, but one that is enduring and of wholeness.

Self-actualising involves an acceptance of one's intrinsic nature, yet with a goal to improve (Ibid., 31-32), to contemplate yet act (130-134), and other behaviours that exhibit balance and a move toward transcendence and highest goals. As self-actualisation is itself ongoing (32), artefacts that enable this process to be ongoing have the potential to remain enduring also. Self-actualisation is not dependent on material possession; however, the material artefact may enable the process.

In further contrast to Walker, my principle of *design for self-actualisation* is also based on objects still in use that enable or are mnemonic of ongoing personal growth and fulfillment, interpreted through material culture and consumer behaviour research in contemporary culture and the survey and interview data. It is the artefacts that can enable the experience of, or remind one to grow toward, higher needs that can be enduring. These artefact types remain relevant as reminders to maintain ongoing growth.

Furthermore, Maslow states it is the “self-actualizing, authentic persons ... [that] resolve the dichotomy between pride and humility” (1968, 125), of “self-hood yet transcending of itself” (117), and “contemplation and action” (133). I maintain that this balance of human qualities and virtues that are sought by the self-actualising person, and the emotional experience with the artefact can be embodied within a design.

This wholeness and balance within a designed artefact is, I believe often perceived as classic or timeless (Schiermer 2016). This balance also embodies human virtues, such as those that are high quality and exceptional in fabrication yet humble in material, strong yet light and vulnerable (Figure 5-23 and Figure 5-25), simple yet complex.

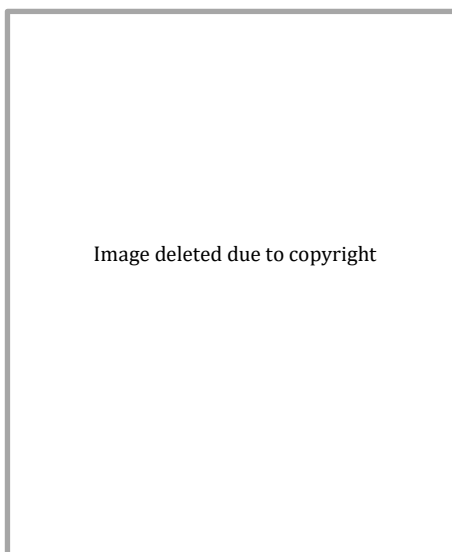


Figure 5-24. Wegner, Hans. *CH24 Wishbone* chair, 1950.

Source: Hive Modern. Accessed 12 December 2017, <https://hivemodern.com/pages/product/202/carl-hansen-hans-wegner-ch24-wishbone-chair>

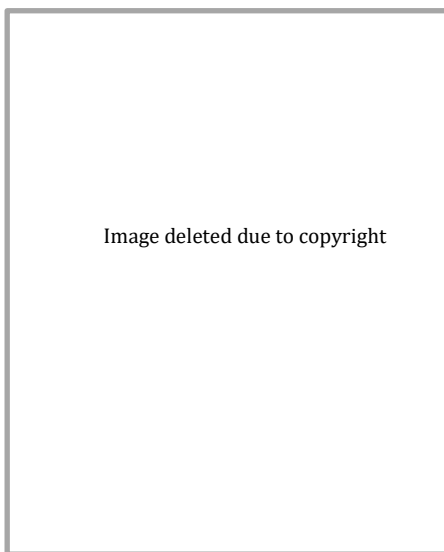


Figure 5-25. Ponti, Gio. *699 Superleggera* chair, 1957.

Source: Cassina. Accessed 12 December 2017, <https://www.architonic.com/en/product/cassina-699-superleggera/1138675#&gid=1&pid=3>

However, embodiment of self-actualisation traits is only *part* of designing for endurance. As shown in table 5-1, the visual function of artefacts is not a prime reason for endurance; it is the experiential which is most powerful in evoking attachment and endurance. Therefore, while this principle is effective to a point, when it is combined with others that are experiential, it affords a more effective approach to designing for endurance.

5.13 DESIGN FOR ENCHANTMENT

Design for Enchantment tangibly communicates the skill of the designer and/or maker, embodying time, care and effort in the works to evoke enchantment. The ‘workmanship of risk’³⁰ (Pye and Nevelson 1973) or a rare and remarkable quality that makes its coming-into-being difficult to understand, can create an enchantment. As an interviewee stated;

Fred: “*Someone’s put sweat and time into that... but it’s almost as though this has ... got a spirit or something. It’s had... energy, thought, care put into it.*” (2016)

Artefacts that express evidence of human effort act as reminders of the time and effort invested by another (Jung et. al. 2011, 65; Kopytoff 1986; Pye 1968, 83). Artefacts of mass-production limit opportunities for meaning-making through place and time.

Longitudinal studies on product attachment describe the active and evolving emotional bond to ordinary products used daily. A series of studies highlight ‘pleasure’ as key components of long-term product attachment (Schifferstein, Mugge, and Hekkert 2004; Richins 1994). Within the category of pleasure, they discuss “superior functionality, aesthetic pleasure... or [pleasurable] benefits such as entertainment or relaxation” (Mugge, Schifferstein, and Schoormans 2006, 641). However, ever-changing technology can quickly render obsolete what was once ‘superior’.

Designers should perhaps aim for a stronger form of pleasure, for an *enchantment*. This form of pleasure is more closely aligned to notions of awe, wonder and magic, as explained in the writings of Alfred Gell (1998) and Jane Bennett (2001; 2009). Bennett goes further, arguing that some objects have a powerful force which enchants us and actually forces us to move, to touch it or be moved emotionally (Bennett 2001a, 4-5). Enchantment is less bound to functionality or changeable aesthetics, thereby inherently less temporal.

Similarly, Walter Benjamin highlights how unique objects and artworks have an aura that engages the audience in contemplation and immersion, allowing abandonment of the self (Benjamin 1936, 304). Reproducibility minimises contemplation. Gell expands on the notion of enchantment:

³⁰ “[The workmanship of risk being the] idea...that the quality of the result is continually at risk during the process of making” (Pye 1968, reprinted 2002, 19).

(T)he power of art objects stems from the technical processes they objectively embody: the technology of enchantment is founded on the enchantment of technology. The enchantment of technology is the power that technical processes have of casting a spell over us so that we see the real world in an enchanted form. Art, as a separate kind of technical activity, only carries further, through a kind of involution, the enchantment which is imminent in all kinds of technical activity (Gell 1992, 44).

Gell implies that artworks and designed artefacts, have two forms of power over the individual; one is a psychological effect of being 'spellbound' by the artwork, at times manifested cognitively, for example, through its symbolism or message. Gell calls this the *enchantment of technology*. The *technology of enchantment* on the other hand, works through the dedicated skill, prowess and awe of human control of tools.

According to Gell, enchanting objects are difficult to comprehend. Our awe stems from the difficulty "...in mentally encompassing their coming-into-being as objects in the world... which, since it transcends [our] understanding, [we are] forced to construe [them] as magical" (Gell 1992, 49). This reflects Maslow's aforementioned aesthetic needs, but also the cognitive needs, through this ongoing process of appreciating and attempting to understand the object's technical achievements, in what Borgmann (1995) terms *engagement*.

When engagement is dulled or pleasure dissipates, pleasure is then sought through consumption of the new (Campbell 1987); thus, an ongoing engagement through enchantment can extend artefact life.

Maslow speaks specifically about the person-object (or person-environment) experience that creates 'peak experiences' possible in people in a state of self-actualisation:

[T]he emotional reaction in the peak experiences has a special flavor of wonder, of awe, of reverence, of humility and surrender ... Perhaps this is in part a hanging onto the experience and a reluctance to go down from this peak into the valley of ordinary existence... [and] an aspect of the profound sense of humility, smallness, unworthiness before the enormity of the experience. (1968, 98)

This hints at the opportunity for artefacts that evoke these emotions, have a profound meaningfulness, and thus can be enduring, as opposed to the superficial artefact that evokes no such contemplation or only temporarily satisfies.

Furthermore, the effectiveness of the enchantment is through “the magical power *emanating* [from it] ... [it] is a physical token [acting as evidence] ... of magical prowess on the part of the owner which is important” (Gell 1992, 46). Interestingly he raises the point that artworks and man-made artefacts both possess the expertise of the artist or maker *and* reflect this expertise onto the owner. Thus, the enchanted object simultaneously acts to reinforce perceived actualisation in the possessor, contributing to status, thereby fulfilling multiple needs identified by Maslow. Achievement of multiple needs, as previously discussed, builds a stronger likelihood of attaining attachment to the object and of its enduring status.

In some ways, to ‘transcend understanding’ contradicts my prior discussion on object knowledge and revealing the narrative or provenance of its coming-into-being. What enchantment can do is to keep at least part of that story intriguing, to evoke preciousness through the making process and craftsmanship. An enchanted artefact possesses its own autonomous character, independent of its place within trend cycles. This is indicated by the continued demand for quality handmade antiques in the marketplace.

Enchantment in an artefact illustrates the aforementioned *evidential function*. It is the effort, skill and time made tangible. It further enhances the artefact’s authenticity, rarity, and endurance.

Although unique hand skills are typical of ‘enchantment’, I have chosen the *Cinderella table*, by Jeroen Verhoeven (Figure 5-25). It expresses both the technology of enchantment through artistry in the use of tools (CAD/CAM technology and timber), human effort and ordinary material (plywood) to produce an artefact of extraordinary complexity, as well as the enchantment of technology, which is created through the symbolism and message inferred. By combining seventeenth and eighteenth-century furniture silhouettes (V&A Museum 2016) with computer technology, the form, meaning and fabrication approach invites the viewer to take time to contemplate and understand, and it is likely to create awe in the viewer of the designer’s process and outcome.

Although not able to be verified, one could assume that due to this complexity, rarity and enchantment, coupled with the framed provenance of it being a limited-edition work, and collected by museums, that this work would be deemed worthy of restoration or repair, rather than disposal in a domestic setting.

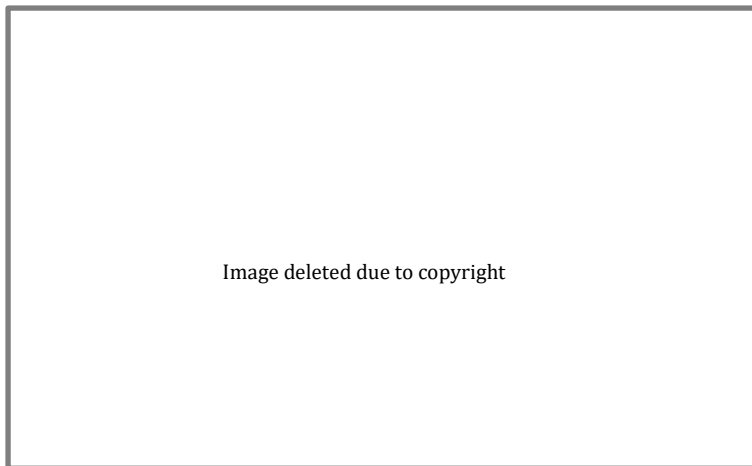


Figure 5-26. Verhoeven, Jeroen. *Cinderella table*, 2005.

Source: Art Gallery of Western Australia. Accessed 14 March, 2017, <http://www.artgallery.wa.gov.au/exhibitions/Thing.asp>

5.14 DESIGN FOR LIVELINESS

Design for Liveliness is when designers animate or enliven an artefact so that the possessor sees the commodity as not just inanimate material, but something of worth which has animate qualities and is worth caring for, saving or rescuing, as is typical of the custodian-heirloom relationship. For this study, two forms of liveliness are most relevant; visual anthropomorphism and relational anthropomorphism.

5.14.1 VISUAL ANTHROPOMORPHISM

Typically, design discourse has taken a semiotic view of liveliness as a visual anthropomorphism most notably in objects that recall human qualities, such as a floor lamp that stands up when someone enters the room (Figure 5-27) or cars that visually depict human or animalistic forms through movement and response (Marenko 2014) or a combination of these visual traits.

Visual anthropomorphism can also be interpreted as including Wabi-Sabi,³¹ patina, broken surfaces, rust and weathering, that express this liveliness through a visible transformation over time³² (Figure 5-27). The artefact is no longer entirely static, but slowly ages, recalling that which is living.

³¹ Although Wabi-Sabi focuses on the impermanent and incomplete (Koren 1994,40) and there are other cross-overs, this thesis does not attempt to make a thorough comparison to the Japanese aesthetic philosophy. For further information see Koren (1994) and Juniper (2003).

³² Recent design research and creative production by Keulemans (2015) complements this area of research.

Visual anthropomorphism has been identified as being conducive to object endurance, because it incites empathy and custodianship through its lively qualities (Chandler and Schwarz 2010). This is generally acknowledged as a means to endurance. I now turn to explain relational anthropomorphism in greater detail.



Figure 5-27. Front Design. *Awakening Lamp*, 2003.

Source: Front Design. Accessed 1 November, 2017, <http://www.frontdesign.se/lighting-projects>



Figure 5-28. Scarpa, Carlo. *Olivetti Building* (detail), 1958. Venice, Italy.

Photo by author.

5.14.2 RELATIONAL ANTHROPOMORPHISM

Verbeek's post-phenomenological and Actor-Network Theory (ANT) view identifies a third, *relational* kind of *anthropomorphism* as extending to incorporate the object 'standing' in for a human other; for example, a wedding ring as a stand-in for a spouse, or an heirloom standing in for an ancestor. It is this mediatory, networked and relational role of artefacts that previous design discourse on enduring artefacts has mainly discussed in relation to electronic artefacts that seemingly 'respond' to user input. Discourse on enduring design does not discuss this phenomenon in relation to the built environment. However, through reflection on my creative practice, it became obvious that creating a relational other is possible in artefacts for the built environment.

By conscious design or not, artefacts do have agency toward humans (Cherrier, Türe, and Özçağlar-Toulouse 2014; Latour 2005; Miller 2005, 11; Verbeek 2005) at times acting as a quasi-other (Gell 1998). People can also easily anthropomorphise objects when it suits (Epley 2008; Gell 1998). If consumers believe objects have an intentionality or agency, the artefact can form the role of a 'social other,' entering into a relationship

with the person (Epley 2008; Gell 1998) and reducing the likelihood of replacement (Chandler and Schwarz, 2010; Cherrier, Türe, and Özçağlar-Toulouse 2014, 105). Designers can thus embody liveliness and the role of a social other in artefacts to support custodial practices and lessen disposal frequency.

Lastovicka and Sirianni (2013) argue that as object attachment grows, objects may become ends in themselves, rather than merely a means to an end. Through this person-object relationship, the person starts to treat the object with more care and attention, akin to a person-person relationship. Although their study and Chandler and Schwarz's studies related to motor cars, it demonstrates that people care for artefacts as if for a person (Ibid. 59). Here, anthropomorphising is not in its visual form, but in its relational status.

Through these authors' research, they assert that an object is a carrier of an "undeleteable past", a factual, *evidential* past that is unchangeable by human agency (Ibid., 105). As noted in the quote below by a survey respondent, the artefacts' containment of history is perceived as physically embedded within photos and an object the respondent found in their great grandfather's abandoned home in a small village in Sicily:

These [objects] are special as they were untouched for decades and contained generations of family history dating back to the 1800s. (Survey Respondent #47. 18-34 year-old, female, non-art-design professional, 2016)

Another of the survey respondent infers that an artefact is an embodiment of a relative's love, and thereby can act to 'stand in' for a social other;

Hand-made blankets (from mother-in-law). I see the time she put into it as a declaration of love. (Survey Respondent #4, 18-34 year-old, female, art/ design professional, 2016)

An artefact imbued with life, that is having a liveliness *emanating* from it, enables the possessor to 'feel into' it, evoking empathy (Curtis and Elliott 2014, 359), and creating a step towards a custodian-heirloom relationship.

This indicates an unexplored opportunity for designers to consider this further evidential function of artefacts beyond the mediatory role in use. The full potential of anthropomorphism can be holistically considered to combine the visual with the

relational.³³ Combining these design opportunities, such as evoking personality, human form, and agentic human-like action, the object's liveliness can be strengthened.

The work *Broken White* by Simon Heijdens below is an exemplar of this approach. The artefact transforms in a subtle but seemingly animate way (Figures 5-28 to 5-31). Akin to wrinkling with age, his ceramic works develop visual cracks that eventually “form a floral decoration that grows like a real flower” (Heijdens 2004, 2nd para.). He simultaneously creates something lively yet static, contemporary yet referencing historical ceramic patterning, that has the potential to trigger memory and be enchanting as it grows with the possessor.



Figure 5-29. Heijdens, Simon. *Broken White*, (ceramic bowl), 2004.

Source: Simon Heijdens. Accessed: 14 March, 2017, www.simonheijdens.com



Figure 5-30. Heijdens, Simon. *Broken White*, (bowl detail), 2004.

Source: Simon Heijdens. Accessed: 14 March, 2017, www.simonheijdens.com



Figure 5-31. Heijdens, Simon. *Broken White*, (bowl detail), 2004.

Source: Simon Heijdens. Accessed: 14 March, 2017, www.simonheijdens.com



Figure 5-32. Heijdens, Simon. *Broken White*, (bowl detail), 2004.

Source: Simon Heijdens. Accessed: 14 March, 2017, www.simonheijdens.com

³³ Also referred to as alterity relations (Verbeek 2005) and quasi-other by Don Ihde (1979).

My creative work also explores this notion of artefacts as a relational other, particularly in the domestic artefacts and the Perth Airport project. The works act to stand in for a human, to reveal stories and trigger memory of historical places, people or events.

5.15 DESIGN FOR AGING

Designing for Aging embodies the quality of the construction and the ability for the artefact to age gracefully while meeting enduring needs. A common characteristic of 'conscious consumers' is the desire to use environmentally or socially superior products or services that physically and aesthetically age well (Marchand, Walker and Cooper 2010).

Custodian practices reveals significant insights into reappropriation, particularly as custodians aim for objects to outlive themselves (Belk 2006). Enduring objects such as the sacred, the ritual, the contemplative, and the heirloom objects, have long-term durable meaning and message, and are built to last, or at least age well or be restored. It is not expected that all artefacts that age well can become treasured, but it is a requirement that the artefact itself can age gracefully, materially and symbolically.

5.15.1 MATERIAL AGING

Furniture surfaces with a perfect colour consistency express newness and unrealistic perfection. Disruption to artificially perfect surfaces abruptly evokes negative connotations, ensuring aesthetic obsolescence. On the other hand, surfaces which more positively accept the passage of time or develop a pleasing patina can acquire evidence of their age, signifying their survival over time. In eras past, patina signified the duration of ownership of possessions, thus authenticating the extent of one's status through past lineage (Curasi, Price, and Arnould 2004, 620). Despite cultural change, patina still implies quality. It is well-established by many theorists, including Chapman (2005), that material qualities should age well for emotional endurance.

My creative production process revealed that designers can design the surface itself to better accept or conceal changes over time; this feature of design was not found in literature on aging gracefully and enduring design. Thus, through my creative works, I have explored the possibilities of surface qualities to engage in the person-object-

relationship over time, as well as accept or obscure aging or slight damage.³⁴

What is deemed to be non-graceful aging of materials and surfaces is also socially embedded and influences psychological obsolescence by implying transience and the temporary (Garvey 2013,83; Hebrok 2014). Surfaces that age 'better' or do not require maintenance by the time-poor are less likely to be disposed of. Surfaces that age can also evoke empathy, allowing one to fall into the work (Bruno 2014; Gell 1998), as well as having a haptic experiential quality of touch, touching, and being touched in return (Stewart 1999, 32).

Figure 5-33 indicates the power of expressing time in surfaces and the multi-layering of enduring principles. Interestingly, the surface not only evokes time and aging, but the aging of the artefact reinforces its bodily accordance through its evident wear, a sense of comfort and privacy by being able to 'feel into' it; the tactility of leather evokes a lively and warm skin-like quality. This chair is also framed by the design industry as timeless and collectible, with verifiable provenance. The patching with what appears to be tape is revealing, proving that despite its wear and tear, this particular artefact has indeed been cared for and rescued through repair, albeit an amateur repair, and is still, despite this, valued. An exact equivalent that was not made with quality materials that age gracefully would likely not have been maintained.



Figure 5-33. Eames, Charles and Ray Eames. *Lounge Chair*, 1956.

Source: Form Republikan, posted 3 March, 2017. Accessed 14 March, 2017, <https://www.instagram.com/formrepublikan/>

³⁴ Inauthentic or stylised aging, however, is generally ineffective, as the fake aging is instantly revealed as such when damage happens in use, and negatively signifies fakery for the possessor.

Although there is a resurgence in refurbishment of ‘classic’ furniture, some designers are specifically addressing the re-finishing of discarded furniture in creative ways, beyond the typical DIY up-cycling or professional restoration. Regarding their *Spoken Leftovers* table designs (Figures 5-33 and 5-34), the group *Design by Leftovers* states the exploration of time in their work, which enables a recontextualization of the furniture and considers surface as both an opportunity for narrative as well as obscuring future damage:

Something to trigger that deliciously fleeting laughter, the wry smile of irony or an insightful nod... Words – captured and cast in a new light. To move, rouse, inspire, provoke. Because they are worth hearing, seeing and feeling – over and over again. (Design by Leftovers, n.d.)

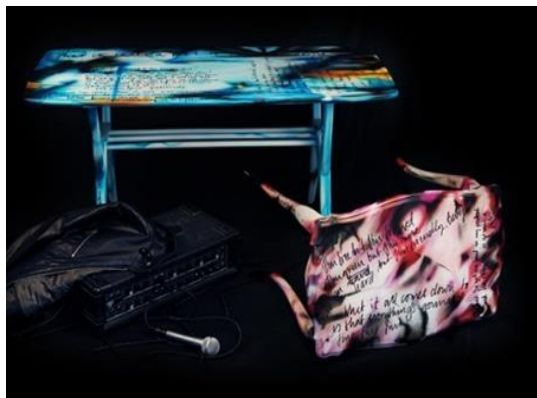


Figure 5-34. Netsman, Linda and Jona Netsman. *Spoken Leftovers* tables, n.d.

Source: Design by Leftovers. Accessed: 14 March, 2017. Source: <http://designbyleftovers.se>

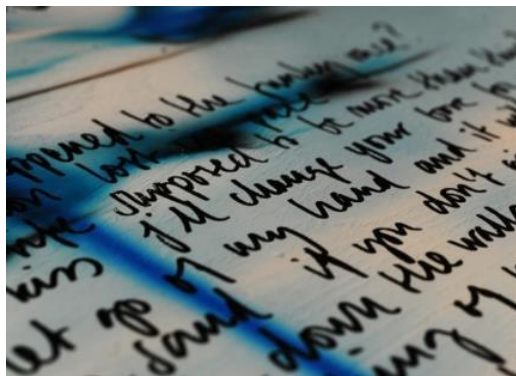


Figure 5-35. Netsman, Linda and Jona Netsman. *Spoken Leftovers* tables (detail), n.d.

Source: Design by Leftovers. Accessed: 14 March, 2017. Source: <http://designbyleftovers.se>

5.15.2 SYMBOLIC AGING

Symbolic qualities should also age gracefully, in terms of an object’s meaning. For example, an authentic hide of an endangered species, complete with head and paws, would likely imply negative connotations within contemporary consumer culture compared to decades past. For design to be enduring, the design should thus consider future cultural shifts. Although this may be difficult to anticipate, the designer should consider the full history of the materials sourced and the fabrication, as well as the symbolic meaning, and make ethical judgements to minimise the risk of future negative connotations. Designers can consider focusing on durable meanings and messages that have remained unchanged over long expanses of time.

Cultural shifts and longevity of meaning have been explored directly in my creative production of the community, built environment artefacts. The symbolic meaning and concepts that drive the designs specifically address shared and positive associations over large expanses of time. Briefly, *From the Skies* is based upon stories of the constellations and telling of stories under the stars for millennia; *Kaleidoscopic Wave* evokes the reflective ripples of the ocean's surface to connect to place and community activities; and the series *Marri-Kingia Past* references the fauna and flora, and its use by humans over the millennia to also connect to the site.

Leftover by Design's customised chairs (Figure 5-36) also demonstrate a creative way of designing for aging while also meeting other Enduring Design Framework principles, such as *design for evolving physical transformation* (by transforming existing damaged chairs), *design for narrative* (by encouraging an imaginative reconstruction), and *design for liveliness* (through personality and uniqueness of each chair). Their design potentially enables appropriation of a 'favourite' chair by different people in the household, creating direct emotional connection and relatedness, while the aesthetics draw upon symbolically enduring elements, configured in a contemporary manner. The chairs allow for future additions despite material obsolescence, as similar but different upholstery would still be aesthetically harmonious to the whole. Provenance of the materials and original chair history can also be woven into an imaginative narrative.



Figure 5-36. Netsman, Linda and Jona Netsman. Custom designed range of chairs, n.d. Source: Design by Leftovers. Accessed 14 March, 2017, designbyleftovers.se/wp-content/uploads/2013/04/g13.jpg

5.16 DESIGN FOR EVOLVING PHYSICAL TRANSFORMATION

Designing for evolving physical transformation accepts that designers can't fully anticipate exactly how objects are functionally used, and future functional requirements. This includes but goes beyond recyclability, repurposing, and upcycling. Designers can

support change by considering ambiguity in use, modularity, adaptability, and spatial transformation needs over time. As Gregson and Crewe (2003) note, artefacts that cannot be disassembled or rearranged can make reappropriation too difficult. “The secret of sustainability in time... is in [the designer] being prepared to let go, to not try and define each and every property and quality of a product in advance” (van Hinte 2004, 187 & 189).

Lifestyle and domestic space requirements change over time, yet furniture is often discarded due to its physical limitations, because it no longer fits spatially or aesthetically. Ensuring objects are adaptable seems an obvious yet largely ignored consideration by designers. Although some tables may be able to expand or contract, chairs may be stacked away or modular lounges reconfigured, these are still in the minority of cases.

It is necessary for artefacts to have segregated components allowing the user to appropriate and use parts in new and unexpected ways (van Hinte 2004, 193). This can account for future, uncertain uses. Many have argued for this, and is commonly termed ‘transparency’, in relation to the making of electronic objects (van Hinte 2004; Verbeek 2005). However, this can also be applied to furniture.

Physical transformation enables a never-ending process of ‘re-enchantment’ (Gregson and Crewe 2003, 112), reappropriation by subsequent owners, and the rescuing of objects from the waste cycle. As one survey respondent stated in relation to one of their precious items;

...[a]n old brass standing lamp. It's vintage and my sister restored it and designed the shades that sit on it. It's one of a kind and guests always admire it. (Survey Respondent # 18-34 year old female, 2016)

Re-making, hacking or reclaiming furniture or used materials for new use has been recently re-examined by theorists (Malewitz 2014) and designers (Rubenis 2015; Holman 2015), largely in response to environmental demands. In fact, the term “gap exploiters”³⁵ is used for many of these practices (Bakker 2014, 63).

Some consumers also practice a DIY approach with re-use of furniture and furniture materials, while some designers/makers such as Piet Hein Eek and Martino Gamper

³⁵ *Gap exploiters* are entrepreneurs seeking gaps in the commercial market that they can exploit to make money, which involves “an existing product and, that the exploitation concerns leftover value and lifespan” (Bakker 2014: 63)

(Figure 5-37 and Figure 5-38 respectively) reappropriate used construction or furniture materials. Others encourage DIY reappropriation of existing furniture or hacking practice; that is, physically modifying the original, through instructional books (Bruno and Baillet 2016), and websites (www.ikeahacker.net).

In viewing the work of Gamper specifically, one must ask if this form of re-designing as a 'critical design' (Fuad-Luke 2009, 120) act only creates a short delay before it re-enters the waste cycle? In contrast, Piet Hein Eek's chair uses 'waste' material to create a chair that would age better materially, symbolically and physically, and visually appears to be comfortable. This highlights the importance of embodying multiple Enduring Design Framework principles to enhance the potential lifespan of built environment artefacts.



Figure 5-37. Hein Eek, Piet. *Waste Waste 40 x 40 chair*, 2014.

Source: Piet Hein Eek.

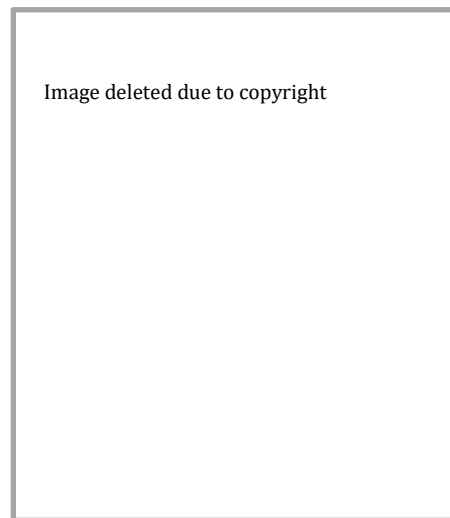


Figure 5-38. Gamper, Martino. *100 chairs in 100 days project*, 2007.

Source: Martino Gamper. Accessed 14 March, 2017. <http://martinogamper.com/project/a-100-chairs-in-a-100-days/>

The *Piano Credenza* by Adam Goodrum exemplifies the opportunities for the professional designer and/or maker to radically transform existing products into a new functioning form. The owner commissioned the designer to use her piano as components for a new furniture piece (Broached Commissions, 2015). The pre-existing relationship with the piano ensures the materials are already imbued with positive association. The design demonstrates how pre-loved materials can be reappropriated for an entirely new functional use — in this instance a functioning sideboard, resulting in something that is unique, highly crafted, imbued with emotion and evidence of past people, place, and events and provenance.

The strength of this design lies in the imbued history that is not only symbolically understood by the current possessor, but the musical origins of the materials are self-evident and presented in an unexpected manner, thus stimulating a future possessor's desire to understand and construct an imaginative narrative. This invites reappropriation by others not party to the artefact's exact history. The *Piano Credenza* (Figures 5-38 to 5-41) addresses the parallel issues of meaningful and historical signification, objectification of social relationships, and consumption as curation or preservation of history, thereby encouraging custodial practices.

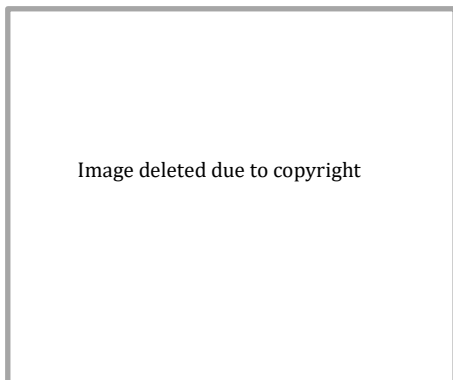


Figure 5-39. Goodrum, Adam. *Piano Credenza*, 2014.
Source: Broached Commissions. Accessed: 14 March, 2015, <http://broachedcommissions.com/piano>

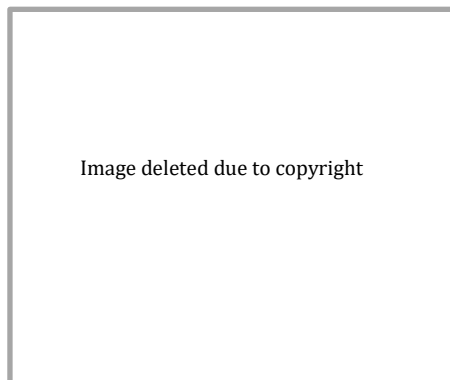


Figure 5-40. Goodrum, Adam. *Piano Credenza* (detail of top), 2014.
Source: Broached Commissions. Accessed: 14 March, 2015, <http://broachedcommissions.com/piano>

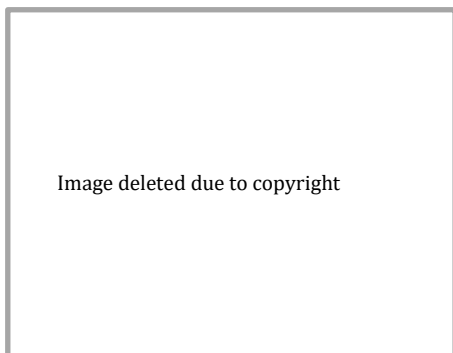


Figure 5-41. Goodrum, Adam. *Piano Credenza* (detail), 2014.
Source: Broached Commissions. Accessed: 14 March, 2015, <http://broachedcommissions.com/piano>

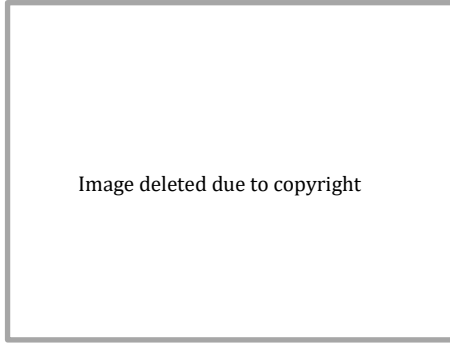


Figure 5-42. Goodrum, Adam. *Piano Credenza*, 2014.
Source: Broached Commissions. Accessed: 14 March, 2015, <http://broachedcommissions.com/piano>

5.17 REFLECTIONS ON THE ENDURING DESIGN FRAMEWORK

The proposed Enduring Design Framework is framed by the post-phenomenological perspective of enduring objects and focuses on extending object endurance via a person-object relationship. Because people and their things can exchange properties (Bennett 2009, 9; Cherrier, 2014), artefacts can give rise to memory, emotions and imbue the artefact with the properties of ‘another’ to heighten potential as an heirloom or an enduring status.

Enduring artefacts can stimulate a sense of responsibility in the owner to care for them, and become a custodian, forming a custodian-heirloom relationship. This new framework articulates the ways designers can encourage the enduring custodian-heirloom relationship by drawing on disparate research from the fields of material culture, anthropology, consumer behaviour and design.

Understanding reappropriation rituals are crucial, as they enable an artefact to be transferred to another when the current owner is relinquishing ownership. Reappropriation rituals, including recovery, divestment, and transformative rituals, were identified by Gregson and Crewe (2003). I have demonstrated how these rituals can imbue objects with meaning and encourage imagined narratives and feelings, or engender empathy for the object. Through interaction and evolving physical transformation, each has the potential to save the artefact from being considered waste.

I have incorporated two additional rituals — custodial priming and curatorial framing. Designers can extend artefact life by considering these rituals; for instance, they can embed a recoverable provenance or narrative in the artefact.

Designers should then *prioritise* qualities that are in themselves more enduring and time dependent and experiential. Designers can introduce elements of discovery, narrative, contemplation, imagined narrative, interaction, community and kinship connectedness, and liveliness, that support unchanging, enduring needs. Although aesthetic and instrumental functions are components of the framework, an emphasis should be placed on imbuing the artefact with memory, evidence or liveliness to strengthen the person-object relationship.

Aesthetic qualities are to be considered as a supplementary, not primary consideration, as the survey results from consumers reveal. From my research, the evidential functions of history and narrative largely inform the irreplaceability and custodianship of unique heirlooms and precious artefacts.

Additionally, heirlooms are rarely one-dimensional in significance. Using multiple constituent parts of the Enduring Design Framework encourages multiple opportunities for the possessor to build and potentially accrue various meanings and significance to further heighten the person-object relationship intensity. This layering of meaning, understanding and value through experience over time, is also rarely mentioned or raised in design discourse, and yet has been revealed through this research as being significant to the evolution of enduring artefacts.

The survey outcomes further suggest that designing for intergenerational endurance of mobile artefacts necessitates appealing to the qualities that connect to memory and kinship relations which are most sought after by females, as they engage most in bequeathing behaviours.

This framework concedes that designers have no ultimate control over the post-acquisition experience; however, design considerations can encourage custodianship by shaping the emotive response of consumers to artefacts. This has been both purposefully and intuitively (Claxton, 2000) explored in my subsequent creative practice throughout the action research cycle. The following chapter presents the creative practice outcomes in relation to the literature review, framework and intuitive design process.

In summary, the EDF principles and how they may be implemented in practice by designers and manufacturers are listed in Table 5-6.

Table 5-6. Summary of Enduring Design Framework principles and implementation examples

Design for bodily accordance	Consider tactility for mnemonic reference, through forms or surfaces that evoke an embrace, positive associations or motion that evokes comfort.
	Employ surfaces that adapt to the body through repeated bodily actions to generate unique comfort for the user over time or wear, such as becoming smoother or softer over time.
Design for empathic visual relations	Encourage a ' <i>feeling into</i> ' the visual form that evokes empathy toward the object, or the object appears to express empathy toward the user.
Design for kinship and self-relatedness	Evoke visual characteristics, such as form, symbolism and materials specific to the kinship or community group, akin to a totem.
	Create unique or personalised artefacts that reflect or recognise kinship identity, significant past life stories or events.
	Integrate symbolism or visual expression that triggers community or kinship belongingness and a sense of place within one's community.
Design for community connectedness	Use locally sourced or culturally relevant materials for the market, to connect to place as it relates to either homeland or host land, from a migrant's perspective.
	Preference materials with minimal processing or materials with irregularity, to highlight the natural quality and origin of the materials; for example, natural grass fibres, wood grain, stone veining and natural surface finishes, rather than surfaces that evoke artificiality, such as a high gloss finish.
	Provide traces or evidence of the maker, to impart human identity to the object, e.g. through hand fabrication, subtle inconsistency of fabrication.
	Incorporate unique craftsmanship that is evidently not possible through machine fabrication.
	Create a sense of connectedness to the individual or groups of individuals as part of the network of the artefact's coming-into-being; this also enhances the 'framed provenance' principle.

Design for framed provenance

Communicate the limited-edition or one-off production process evidenced explicitly on the artefact, through branded stamps, certification etc., or communicated through external media.

Communicate the high quality or unique craftsmanship extrinsically to the artefact, such as through online media platforms.

Collaborate with artists or renowned designers, for exclusive variations (colour, patterning, surface etc.) to enhance the sense of authenticity and creating rarity, thereby attracting collectors, connoisseurs or develop 'aficionado-appeal'.

Develop a way of recording ownership or the object's involvement in special events, use by renowned people, or evidence of its place of origin within or extrinsic to the artefact. This can be achieved through transmission of production and design information (such as live recordings or imagery, through social media such as Instagram) or through accompanying physical or digital products. *Bemoir* is a phone app that records events, details, and the artefact history through photos, words and audio recordings which can later be forwarded onto to others, thereby sharing the artefact's social life (Mo Works CreativeAgency 2015).

Reveal object history such as material origins, ideation origins, fabrication origins, meeting the makers through various means, such as person-to-person, print, online or other media.

There is an increasing interest in the hand-made (Luckman 2015) and open house artist/design maker studios, and factory tours. There exist opportunities for designers and manufacturers to further 'frame' and provide object biography in an authentic way, as opposed to advertising (Parsons 2009, 29), to create understanding and connection to objects, while cushioning the impact of commercial advertising that tacitly promotes discarding of the used.

Explore opportunities for uniqueness such as using upholstery fabrics with irregular or unpredictable patterning, or an excessively long pattern repeat or texture, which, when applied to a form, create unique variants each time. For example, in the design of *Repeat Classic Print Textile* by Hella Jongerius, designed in 2001 (Roberts 2007, 181).

Design for narrative

Construct a narrative that is told *about* the object (extrinsically), for example online, through partnered activities such as marketing or advertising, textual or visual myth-making,³⁶ with the packaging or material object itself, through verbal discussion or print material available, perhaps made available at point of sale.

Tell a story *through* the object (intrinsically) on the object surface, inside the object, or through a paired digital or physical artefact.

³⁶ Although Walker's examples are not aimed at consumers, his 'visual myth' posters tell a story about his designed artefacts that are "supplementary...provides insights about the creative process" (Walker 2011b, 105).

Design for narrative (continued)	Design to trigger discussions with others so the object builds up experiences over time.
	Integrate narratives. Narrative may be false and entirely imagined or hinted at and open to interpretation. This approach facilitates the imagined historical reconstruction behaviour found predominantly in male second-hand consumers and reinforced in my survey and interviews. Narrative may be clear and defined or ambiguous.
Design for user interaction	Enable user participation in the conception of the project such as commissioning and providing the brief or materials for its manufacture. This is typical of a one-off bespoke approach and may be cost prohibitive for many consumers.
	Enable users to continue to interact with the artefact during use, i.e. modifying configurations and functions
	Enable the adaptation of an existing object for completion by the consumer; termed the 'unfinished object' by Parsons (2008). Designs can afford adaptation and personalisation by having predetermined or open options for customisation. For example, websites such as IKEAhackers.net empower affordance via DIY alterations to existing objects, suggesting how IKEA surfaces that are intentionally left can be user decorated, or designed components can be added to the existing to modify or personalise the design. These products are often lower cost and thereby available to more people, while simultaneously creating 'transparency' advocated by design theorists (Marchand, 2009; Walker, 2010).
	Consider the artefact as a visual 'background' or as a 'silent performer', that is something that goes unnoticed until it fails, it is not associated with social status (Park 2010, 88) and therefore does not fall out of 'fashion' or trends in social status.
	Integrate co-creation in the design phase through online interactive generative programs that allows the user to modify parameters of a design for personalised aesthetic, function or features. ³⁷ Sometimes called 'open source', 'mass customisation' or 'open design' (Thorpe 2007, 145).
	Provide personal customisation at point of order to create one-off or limited-edition customisation also raises its perceived value and self-relatedness ³⁸ .
Design for self-actualisation	Invite contemplation, slowing down, or enabling a spiritual ritual.
	Consider how to incorporate reminders of transcendent and enduring human virtues, such as humility, honesty, commitment and dignity.

³⁷ Although some furniture manufacturers have embraced the customisation of furniture, when customisation is limited to colour or material, personalisation is minimal. Digital production processes allow a far higher degree of variation and cost effectiveness.

³⁸ "TOG goes further, with a focus on the final user customisation: a do-it-yourself concept in order to foster uniqueness leaving it to the customer's fantasy and creativity... [or] selecting a customiser from a network of creatives around the world for a bespoke commission." (TOG 2017b, 2nd paragraph).

Design for enchantment	Employ techniques which demonstrate a workmanship of risk.
	Effectively communicate to the consumer, an enchantment and appreciation of value in craftsmanship and manufacturing skills.
	Tangibly embody time, care and effort in the work.
	Create artefacts which imply difficulty in their coming-into-being.
Design for liveliness	Use or create surfaces that have a natural, evolved or 'lived' quality, akin to or resulting from nature, through texture, patina, pattern, gradation or variation in colour, grain and the like. Integrate variability in production processes so no two objects are exactly alike, akin to something alive.
	Endow the artefact with narrative which stories can be told <i>through</i> , akin to the way we use photos; a defining feature of heirlooms; it acts as a stand in/a relational other.
	Maximise the opportunity to collect memories through a possessor's experience with it, that is to be used in daily life or multiple ways.
	Embed an ambiguity or curiosity that stimulates <i>imaginative history making</i> (Gregson and Crewe, 2003, 147) so as to be perceived as imbued with social other.
	Make tangible object biography or personality.
	Express other relational anthropomorphism qualities such as a helpful or supportive function that 'stands in' for a social other.
Design for aging	Design for variation within the work where a new component of a differing age or time will not be seen as incongruous (see Figure 5-36).
	Design to be engaging over time, such as irregular or textural surfaces and enchanting qualities that take time to experience, discover or attempt to understand.
	Design the surface and material to harmoniously absorb or deflect the impact of time and use, such as scratches, dents and even cracks. ³⁹
	Consider meaning beyond the 'now' and consider possible future and intergenerational interpretations.
	Design for discovery over time, with elements revealing new information through use or reconfiguration.
	Design with quality construction and materials.

³⁹ Wear and use however should take a considered approach, as bodily smell and stains often devalue possessions (Gregson and Crewe, 2003) and thus evidence of wear and use should be in a form that can be appropriated yet maintain value.

Design for evolving physical transformation	Design to facilitate the future re-processing of the material beyond the 'first' artefact life of the material.
	Reuse existing artefacts or materials that allow an artefact to evolve (with the potential to add ambiguous symbolic meaning to entice <i>imaginative</i> and <i>creative</i> engagement).
	Design to maximise reappropriation, modification, reconfiguration, modularity, compatibility and functional role over long time periods, including introducing new parts to adapt the existing over time.
	Design for flexibility of parts over time, in particular ensuring parts are easily separable and replaceable with no need for specialist tools or equipment which may become obsolete over time.
	Employ manufacturing techniques or materials that are less likely to succumb to obsolescence, thereby enabling future addition of matching parts if needed.
	Design shrouds or skins that can provide both protection of the original and simultaneously signify a temporary new user preference. For example, preserving a fading trend under a cover which can be removed later if the trend returns. This extends the life span of the original object, and potentially dealing with the non-self relationship problems with unwanted or disliked aesthetics of inherited products; Working akin to 'Gap Exploiters' (Bakker et al. 2014, 63)
	Create the opportunity for reappropriation, reconfiguration or co-creation by the user, i.e. a kit-of-parts system make connections or disassembly self-evident, multi-functional, simple and easily understood, small, easily transportable and lightweight components, and to minimise disengagement or confusion.

CHAPTER 6 ENDURING ARTEFACTS THROUGH CREATIVE PRACTICE

This creative practice component of the doctoral research is to explore and speculate on approaches to enduring design through contemporary fabrication processes and propose creative and tangible alternatives to the existing approaches.

To explore the concept of enduring design with a wide scope, my creative production research encompasses built environment artefacts at a small scale, such as furniture, and larger scaled (up to 200sqm) public artefacts. It was important to consider how artefacts may be transferred between family members, as well as considering how objects can connect to an unknown audience to maximise reappropriation and the potential to be enduring. Additionally, the projects range from bespoke, one-off, highly crafted artefacts to propositions for DIY and Open Source, co-created products.

The artefact's role as evidence offers new opportunities for design by encouraging ways in which artefacts can act to stimulate mental engagement and rituals, form connections, and build new experiences and narrative. This doesn't imply that the domestic artefacts will replace or embody witnessing in the same way as photographs may, nor is this the only way to make artefacts enduring. Rather, a balance and combination of approaches is proposed across instrumentality, aesthetic and semiotic considerations, while incorporating evidence (through participation or historical narrative) to support the opportunity to trigger memory. This combination of artefact functions can be emotionally evocative and afford custodianship.

While form has long been explored as a mode of expression, I instinctively explored how the surface can invoke contemplation and a deep reading of the work, to facilitate rich interpretations and trigger memory. Personal experience is always user dependent and outside designers' full control, but this doesn't imply that designers must surrender their influence on the communicative role of the surface.

By exploring this new path for attachment, the creative production described here demonstrates how design can engage with concepts of time, enrich opportunities for constructing meaning, create opportunities for real and imaginative historical

reconstruction, and keep stories alive to engage with future custodians. The surface of public or private artefacts provides an impetus for discussion to stimulate sensory engagement, and inspire contemplation.

In the previous chapter, I have reflected upon how the Enduring Design Framework relates to existing practice by highlighting what I have interpreted to be amongst the exemplary works of each of the twelve constituent parts. I subsequently explored intuitively what I felt were neglected design opportunities in response to the research questions.

The creative production commences with examination of my own children's extended family going back four generations, as a way of piloting discussions, freely exploring and testing ideas without external limitations or client expectations, to create a bespoke, intimately scaled heirloom artefact titled *Endless Quilt*. I created another work, *The Unforgotten*, examining one daughter and her mother's relationship through narrative and memory.

To push the applicability of the emerging framework, I then explore the framework through a series of what I have termed community artefacts within the built environment. I examine how narrative can be applied at the public scale in a 90sqm acoustic wall installation, *From the Skies*, addressing a vastly diverse community of international and local audience at the Perth Airport. Further, I explore more integrated public artworks, *Kaleidoscopic Wave* and *Marri-Kingia Past*, both at senior schools, communicating past memory and site history to give contemporary relevance and awareness of past events, places and others to the current young custodians of the space.

The final works are two iterations of a self-assembly design, a prototype, *En-case* and *For Now, For All-ways*, that explore a user consultation model for commercially viable domestic furniture.

As mentioned in the methodology section, expert reviewers were appointed to critique the *Endless Quilt* and *The Unforgotten* works. The feedback largely reiterated my views, my research and direction. This supported my personal critique, but also raised questions about enduring design and low-cost artefacts, which are addressed by *For Now, For All-ways*. Although the reviews are not directly addressed within this section, they are included in the appendix for reference.

As a result of the creative practice process, I integrated and explored new techniques to treat artefact surfaces that became integral to the works. I developed and refined ways of exploring the surface, from: texture — both shallow and deep engravings with self-designed illustrations; to the use of images, words and illustrations; to photographs of sentimental artefacts with 3D engraving, to create mnemonic texture. Additionally, at a larger scale I explored creating surface texture and visual representation through perforations, and thereby blurring the boundary between surface and form. I also examined ceramic printing of self-designed illustrations on glass, to ephemeral collaging of photographs digitally printed onto timber. This enabled me to explore narrative at various scales and levels of intimacy, for various audience sizes.

By discussing my work informally with audiences and watching their behaviour, I noted that the *imaginary historical reconstruction* that Gregson and Crewe discuss was evident in the audience. I noted the sense of discovery evoked through ephemeral or assemblage techniques of engagement was particularly effective in the audience, as they would be physically drawn into the work to discover its meaning and ask questions.

The design process also informed the Enduring Design Framework in ways I had not anticipated. Through these projects I came to realise, for example, that design for aging can go beyond merely selecting materials that age elegantly. Instead, designers can modify standard supplied surfaces to yield rarity and uniqueness, personalisation and user participation; on a practical note, it also serves to redirect attention away from incidental damage or scratches. Additionally, the design process enabled me to intuitively explore symbolic meaning and narrative deeply embedded over multiple generations, to seek ways of surpassing fashion, trends or status-seeking newness, to give rise to the concept of designing for *symbolic aging*.

Similarly, the *Endless Quilt* spurred interest in exploring *design for bodily accordance*, *design for liveliness* and *design for empathic visual relations*, thus far not explored by design theorists addressing enduring design approaches.

I will now discuss the details of each project independently, and indicate which principles from the Enduring Design Framework have manifested materially.

6.1 DOMESTIC ARTEFACT: *ENDLESS QUILT*

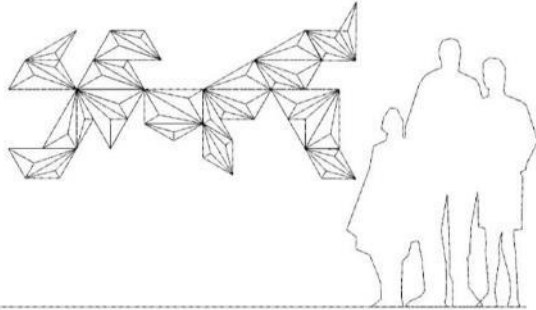


Figure 6-1. Forlano, Penelope. *Endless Quilt*, 2012. Elevation diagram. Forlano, 2017.



Figure 6-2. Forlano, Penelope. *Endless Quilt*, (overall closed view), 2012. Forlano, 2017.

Dimensions: 2,100mm W x 1,100mm H x 120-350mm D

Materials: Reclaimed WA Blackbutt timber, pre-impregnated fibreglass and mild steel, PVA glue, Dacron, battery and LEDs. Manufacturer: Forlano Design and Composite Components

Exhibition: IDEA International Symposium research exhibition, 'An Interior Affair; A State of Becoming', FORM Gallery, King St, Perth. September 7- October 6, 2012.

The *Endless Quilt* was the first experimental, doctoral creative work; an artefact expressing kinship-embedded self, revealing family history and identity as open-ended and in a “state of *becoming*” (Forlano 2012, 30). Driven by research on artefacts mnemonic of significant persons, places and events, this work creates a new site for the expression of past and future development of emotional attachment and the extended self.

This project has enabled an understanding of how consumers may participate in a design process while also learning about, constructing, or seeing their identity in a new mode. The symbolism creates an opportunity for recollection, mapping a chosen history and a curation of family history explored through surface.

Materialisation of Design for Kinship, Self-relatedness and Narrative

I reflected on my own and my husband's memories, stories about kin, and held informal discussions with family about what shaped their lives and their parents' lives to represent four generations of stories. I visually mapped the most evocative and strongest stories (Figure 6-3). This aimed to express the shared kinship-embedded self for my family and children.

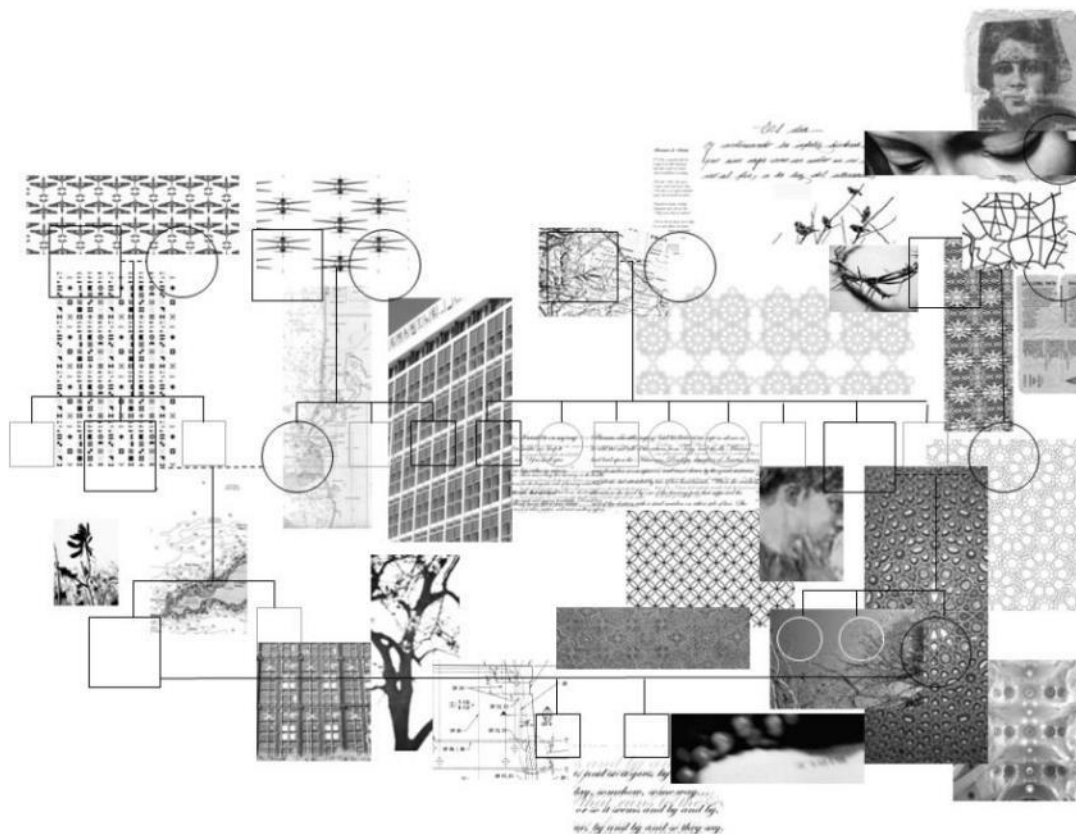


Figure 6-3. Composite family tree and visual mapping. Forlano, 2012.

The form was inspired by quilt-making techniques for its association with traditional quilt making and storytelling. Quilt making was traditionally practised through the *women's work* of sewing and making objects of family significance. Quilts materially bear witness to women's invested time and their handcraft and are also typically constructed by the matriarch. The quilt is a material embodiment of her family role as mother, nurturer, and provider of warmth and protection. In this sense it mirrors me, the maker,

and my role as mother, constructing an heirloom for my children and is thereby particularly apt, imbuing the work with my effort, time and creativity.

As exemplified in this heavily embroidered *Westbury Quilt* (Figure 6-4 and Figure 6-5), women often embroidered illustrations, stories and poems or words to evoke place, memories, and to keep family stories alive and visually present within domestic space. This embroidered and narrative aspect for quilting is implied through the laser engravings.



Figure 6-4. Hampson, Misses. *The Westbury Quilt* (detail) c. 1900-1903, (Fabric quilt). Photo by author.

National Gallery of Victoria, Melbourne.



Figure 6-5. Hampson, Misses. *The Westbury Quilt* c. 1900-1903, (Fabric quilt). Photo by author.

National Gallery of Victoria, Melbourne.

Endless Quilt is the first creative work in my professional practice in which I integrated illustrations, graphics and text via laser engraving techniques and visual narrative. The digital data for engraving emerged from various techniques including photography, digital illustration (using various programs) and scanning of three dimensional artefacts. I also experimented with various effects from shallow to deep and 3D engraving to evoke various levels of intensity, detail and visual attention in the work. Most significantly, engraving allowed me to create extremely small and intricate detail akin to the fine thread of needlework, to draw in the viewer, create a person-object intimacy, and encourage a tactile engagement.

Materialisation of Design for Enchantment

Further responding to sustainability issues, the traditional quilt expresses itself as an assemblage of off-cut fabrics considered less useful, and transformed into a useful artefact. In the *Endless Quilt*, the major materials — timber, metal, Dacron and fibreglass — are all off-cut ‘waste’ materials transformed through craft and intricate techniques to become engaging and valued, akin to an artwork. The timber is from domestic floorboard off-cuts, the fibreglass and metal are off-cuts from our family fabrication business, and the Dacron strips (for the live hinges) are recovered from a local sail-making company. Through the processes of joining, cutting, machining, engraving and assembling, the off-cut materials become something of increased use, exchange and emotional value.

Quilt making emerged as a ‘make do’ or patchwork product, frequently trimmed into geometric forms, stitched together to grow larger and larger over time, and this is echoed in the *Endless Quilt*. The object form of the *Endless Quilt* references this quilt making tradition with triangular geometry as this is the most graphically mnemonic of quilting (Figure 6-6 and 6-7).



Figure 6-6. MacArthur, Elizabeth. *Quilt*, c1840.

Photo by author, 2015. National Gallery of Victoria, Melbourne.



Figure 6-7. Unknown creator. *Quilt*, (detail) c1840.

Photo by author, 2015. National Gallery of Victoria, Melbourne.

Quilts are both crafted artworks and practical objects. Conceived as bedding, they are also viewed as an artform in their own right, at times hung on walls as textile art. My creative work is similarly conceived as somewhat ambiguous; a wall mounted contemporary (quilted) bed-head with semi-concealed functions, or a wall-mounted artwork. Particular modules have small functions, intended as a discovery for the possessor to know, but to be semi-concealed to the casual observer.

This semi-concealed function was designed as a way to reveal something to the possessor that the casual observer is unlikely to notice, creating a personal engagement with the object⁴⁰ and a sense of discovery. Additionally, it reinforces the ambiguous purpose of the work. Of the three operable components, two can be lifted up and magnetically held in place to form bedside reading lights, and the other can be folded down and used as a shelf, to place reading glasses or jewellery just before sleeping (Figure 6-8).



Figure 6-8. Forlano, Penelope. *Endless Quilt*, (components in open position), 2012.

Photo courtesy of FORM and IDEA.

Gell (1992) describes enchantment as when the possessor is in awe of the object and desires to be “possessed in an intellectual sense rather than a material sense... (of the object’s) coming-into-being” (49). If this can be achieved, the object nurtures a custodial relationship, as it appears to transcend the ordinary and everyday, and is more likely to be worthy of bequeathment. The *Endless Quilt* has been designed to have intricate detail, demand craftsmanship, and require the possessor to contemplate its meaning and unique fabrication to generate an enchantment.

⁴⁰ Elements within the form that suggest a peeling away from the wall are able to be grasped and hinged open. Sandwiched between components, the white Dacron is only barely visible and acts as a *live* hinge.

Materialisation of Design for Interaction and Evolving Physical Transformation

The modular geometry and potential for ongoing expansion enables parts to be replaced if irreparably damaged or the meaning of representations shift negatively over time. New parts can also be added to contribute new stories. Whereas large or heavy timber heirlooms require their new possessor to have the required space to accommodate such a piece, this intentional breakdown of small and lightweight parts allows the work to be spread throughout someone's dwelling, assembled together, or be split between custodians in order to increase the likelihood of the longevity of the object. This is depicted in the visual series (Figures 6-9 to 6-11).

Furthermore, the modular design requires the user to make decisions as to whether its goal is purely decorative or requires functional parts, how it is configured, and the quantity of parts — what Verbeek and Borgmann refer to as *active engagement* (Forlano 2012, 30).

The 'flexibility' dimension allows the user to configure the modules in endless ways, allowing users to add or subtract depending on their life situation. The user can appropriate, control, modify and adapt the work over time so it is a constantly evolving work. The person-object relationship and personal knowing of the object are strengthened by the user's control, revealing or concealing the internal components and hidden uses. (Forlano 2012, 31)

Materialisation of Design for Narrative

As the faceted or triangular form created was simultaneously becoming 'fashionable' across various design disciplines at the time, there may be the assumption that the form is intentionally designed to be on-trend. Although it references traditional quilting, the form may 'fall out of style'. As the triangular geometry also incorporates the engraving, however, it has a distinctly narrative association and I propose that it thereby extends the design beyond the purely visual form to genuinely reflect quilting and authenticity in its design. It is anticipated that the richness of meaning and the detailing that draws in the viewer evokes curiosity and imaginative narrative (Figures 6-12 to 6-17).

An alternative viewpoint is that in the future, it may be seen as being 'of its time' and capturing the aesthetic spirit; however, this can only be determined through future research.



Figure 6-9. Forlano, Penelope. *Endless Quilt* (five components), 2012.



Figure 6-10. Forlano, Penelope. *Endless Quilt* (eight components), 2012.



Figure 6-11. Forlano, Penelope. *Endless Quilt* (eight components), 2012.



Figure 6-12. Forlano, Penelope. *Endless Quilt* (detail of Italian poetry), 2012.



Figure 6-13. Forlano, Penelope. *Endless Quilt* (engraving details of Madrid streets and nautical flag graphics), 2012.



Figure 6-14. Forlano, Penelope. *Endless Quilt* (engraving details of lyrics and Alcazar building details), 2012.

Photography by Critchett, Kyle 2013.



Figure 6-15. Forlano, Penelope. *Endless Quilt* (engraving details of lacework), 2012.

Photography by Critchett, Kyle 2013.



Figure 6-16. Forlano, Penelope. *Endless Quilt* (engraving details of cranes), 2012.

Image courtesy of FORM.



Figure 6-17. Forlano, Penelope. *Endless Quilt* (engraving details of “Penelope, the weaver”), 2012.

Photography by Critchett, Kyle 2013.

With no clear starting or end point to the storyline sequence and relation of parts, it reflects memory itself as fragmented and incomplete and a blurred notion of time (Figures 6-12 – 6-17). This design approach is intended to be suggestive and alluring, drawing one into the story to contemplate its meaning, to engage with it carefully and intimately, to uncover details, or to construct an imagined history allowing for a ‘recovery ritual’ process.

The form and inscriptions suggest stories, to allow for an interpretation by the viewer, such as: a partial sailing chart of Rottneest Island reflecting the family’s sailing pastime and a six-month residency at the island; a geometric pattern made of sailing flags (Figure 6-13); a well-known poem by a famous Italian in his home town dialect (Figure 6-12), which is not only about family, but the author was my paternal grandmother’s friend, and the poem is a favourite of my father’s.

The engravings reflect intimate family knowledge to reinforce its personalisation, and to recall memories of those who hear the stories, or to create a re-imagined narrative if reappropriated by others. The symbolism in the surface, combined with the formal-aesthetic design and evidential story-telling role, enables personal experience, contemplation, and narrative construction, as essential components of emotional connection and long-term ‘feeling into’ the work.

Materialisation of Liveliness

It is through these multiple approaches and layering of principles that I expected it to transcend the purely visual or symbolic role. The narrative element of the engraving has an evidential role, to act as a story-telling device, and to evoke discussion through the multifarious symbolic messages.

Stories from my family's past are suggested and implied, but not entirely explicit. Less a literal autobiography of family 'facts' such as family photos, significant dates or data, the imagery is represented as if stumbling upon fragments of a story which is yet to be fully constructed or revealed. Laser engravings predominantly finish at the edge of the surface, as if graphics and illustrations are cut abruptly and incomplete, so to appear as partial messages to be decoded. Other surfaces are blank, perhaps erased or yet to be inscribed. The form itself has an incompleteness yet continuity; spaces between the timber components suggest missing elements, or space for future elements to be inserted, to imply the story is still evolving, still living.

The work also looks to the future. By making these memory fragments visible, they become present in the here and now, in the space, and a stimulus for discussion.⁴¹ The intention is that discussions of the work aims to incite potential future custodians' emotional attachment by appealing to the shared elements of the kinship-embedded self. As we live with the work personally, it stimulates discussion with my children to hear stories, explain the engravings' significance and gives an insight into family heritage. This demonstrates a way to encourage the priming of future possessors and custodial knowledge transfer to avoid disposal of the object.

This collaged effect of moments, stories, places, events, and histories, weave together to give a historical 'picture' of who this family is, in a very specific, connected and inalienable manner. This form of montage, with no clear beginning or end, allows the viewer to make their own creative associations and connections between the surface representations and personal memory of stories and the like.

⁴¹ In contemporary western lifestyles, sitting around the dinner table or fire telling stories of the past is fading. I believe the need for interrupting the everyday to stimulate personal and family discussions assists us to meet the 'higher needs' that Maslow discusses, through moments that stimulate self-reflection.

Embodied within the work are several 'others' (ancestors), each telling their own story across time and space. For the possessor, it reflects what elements they choose to present within the home to others and what they decide to add and give to their future heirs.

In her book *Surface*, Bruno argues that just as a sense of place is constructed of the various visual (and other sensory) representations in the arts, over time and through the 'flow' of memory (Bruno 2014), so too can a 'sense of self' be constructed. The *Endless Quilt* reflects this process of visually reflecting the past through stories and representations of significant life events of self and others. They are embedded into the artefact's surface to be lived with, and enable self-identity to become somewhat tangible, reflecting back in a particular "mode of seeing" (Bruno 2014, 188).

Informal feedback

When *Endless Quilt* was completed and exhibited in 2012, the audience feedback proved valuable. Without explaining the project verbally or with text to the audience, the informal discussions revealed that the audience perceived the work as highly personal, despite not being clear on exactly what personal story was being revealed. It was also remarked many times that it appears to have been a long making process heavily invested with the maker's time. This indicates that the project successfully evokes narrative, kinship and self-relatedness, liveliness as a storytelling other, and the enchantment principles I aimed to evoke. However, the depth of knowledge of family history required for this project is evident, and thus with the associated time and cost, it has limited commercial applicability.

As a designer, this project sparked interest in developing areas I felt were a gap in the design of enduring artefacts and practice in general. Most notably these gaps were identified as design of the surface itself, rather than relying on manufacturer's options and the kinaesthetic understanding of the work through the moving parts. The former is explored in all future projects, and the later was mostly explored in the *En-case* and *For Now, For All-ways* projects. Additionally, in combination with theory, the design of this project gave rise to the Enduring Design Framework concepts of *design for liveliness*.

6.2 DOMESTIC ARTEFACT: *THE UNFORGOTTEN*

Section 6.2 is adapted from the article 'Resurfacing Memories; Mnemonic and Tactile Representations of Family History in the Making of New Heirlooms' in *Interstices* Journal 'Return to Origins', Issue 17, 2017

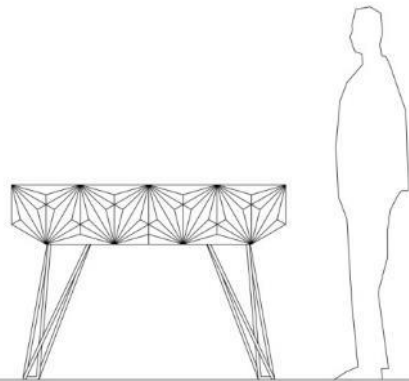


Figure 6-18. Forlano, Penelope. *The Unforgotten*, hall console, 2013. Elevation diagram.



Figure 6-19. Forlano, Penelope. *The Unforgotten*, hall console, 2013.

Photography by Eva Fernandez, courtesy of FORM, Contemporary Craft and Design.

Dimensions: 1,380mm W x 950mm H x 335mm D. Materials: *American black walnut* timber and stainless steel. Exhibited: "From the Atelier", FORM Gallery, Perth, Australia. 13 June - 29 August, 2013.

As the entry of the home is a powerful signifier of personal space and identity, *The Unforgotten* hallway cabinet was designed to be an entry marker reflecting the essential concerns of the resident, intertwining emotional gravitas with product durability (Figure 6-18 and Figure 6-19). The geometric and faceted timber front and sides of the cabinetwork facilitate the expression of past memory as distinct life episodes *collaged* together in a traditional quilt-style narrative, similar to the *Endless Quilt*. The cabinet's form creates a series of variegated surfaces into which the narrative of the client can be read as distinct yet connected stories in order to reify social relations and memory.

Materialisation of Design for Aging

The Unforgotten is made of solid stainless-steel rod and solid American Walnut timber finished in natural, non-toxic furniture oil and wax, to ensure material longevity and potential surface renewal as it ages. The low sheen finished timber and the electro-polished stainless steel (solid) rods and use of premium quality materials increase its potential to be valued inter-generationally.

The timber also characterises age, not only in the decorative application of 'past' memories, but also in the growth swirls timber grain. The natural aging of the timber contrasts with the slower metallurgical aging of the base, reinforcing a passing of time over long periods, denying the ephemerality of the artefact.

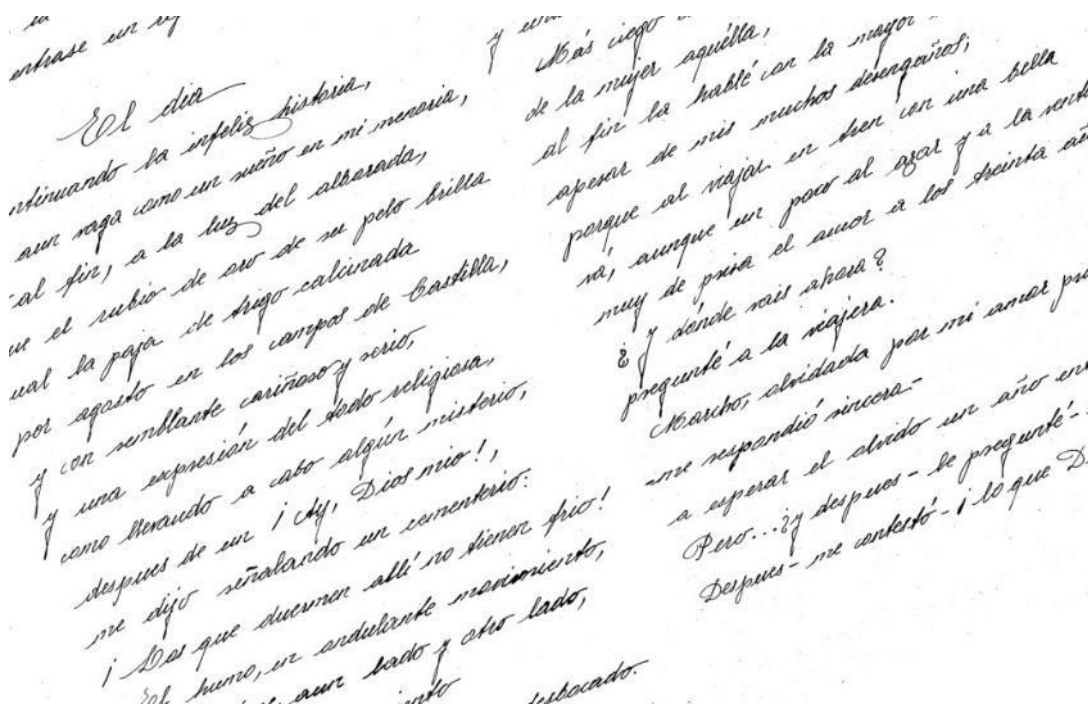
The design also references quilting with a series of engravings which is intended to evoke uniqueness and narrative in both form and surface, being key to irreplaceability of artefacts, while also not being 'on trend', to maintain longevity in its symbolic meaning. The engravings are of symbolism or objects that are 60 years old or more, reinforcing a long view of time.

Materialisation of Design for Narrative and Kinship

The Unforgotten exemplifies opportunities for emotional connection through tactile experiences and mnemonic qualities, and by beckoning the viewer to be drawn in and create intimacy through touch. It was revealed through an informal interview that the client possessed some disparate and highly personal objects kept hidden for over 60 years in a small box, which served as the driving force to reflect personal history and intergenerational narrative in the hallway cabinet. These objects — the only physical possessions remaining of the client's mother after her passing during child birth — had

been stored away so as not to be damaged by time, from handling, from light, and other intrusive environmental elements. Amongst the possessions were her mother's handwritten poetry (Figure 6-20), hand-made silk embroidery (Figure 6-21), newspaper cuttings, and hand-drawn diagrams of embroidery never completed (Figure 6-23).

The texture of the silk (Figure 6-21) now partly decomposed, is captured in the cabinet's surface treatment. It reflects a moment in time, and the time in between spanning its first completion in 1950 and sometime in the future when it will have completely decomposed. Surfaced in the cabinet is both the 'thing' (the silk) as a tangible object, and the 'time' constituting an intergenerational heirloom artefact. As a further example, the hand-written words and diagrams on pieces of decomposing paper, are now inscribed in a more robust material while also providing a new character not evident in the original possession—that is, the text as textured material.



El día
continuando la infeliz historia,
aun saga como un niño en mi memoria,
al fin, a la luz del alborada,
en el rubio de sus de su pelo bella
ual la paja de trigo calibrada
por agosto en los campos de Castilla,
y con semblante cariñoso y serio,
y una expresión del todo religiosa,
como llorando a cato algún misterio,
después de un ¡dij, Dios mío!,
me dijo señalando un cementerio:
¡Dios que duermen allí no tienen frío!
En humo, en ardiente manicomio,
aun bajo y otro lado,
¡abocado.

¿Vas ciego
de la mujer aquella,
al fin la hablé con la mayor
esperar de mis muchos desengaños,
porque al mirar en sus con una bella
ra, aunque un poco al notar y a la vez
muy de prisa el amor a los treinta años
¿y donde vas ahora?
pregunté a la mujer.
¡Carito, olvidada por mi amor ya
me suspendió sincera-
a separar el clavo un año en
Pero... ¿y después - lo pregunté -
Después - me contestó - ¡lo que D.

Figure 6-20. Faerna, Maruja Rodriguez. Handwritten transcribed poetry (portion). c1949 (scanned image 2013).



Figure 6-21. Faerna, Maruja Rodriguez. Handmade silk handkerchief, c1950.

Materialisation of Design for Liveliness

Through digital processes including 3D laser engraving, the characteristics of the ‘things’ become both visual and textural, eliciting an invitation to touch and become more familiar with the previously ‘untouchable’ precious object. As Stewart states, “The transitivity and motility of touch are key to legends and myths of animation... of a living thing bringing a dead thing to life through the transitivity of touch” (1999, 33).

This reflects the enduring design approach of liveliness in an unexpected way, through intimate engagement with the work of a significant other, an ancestor, similar to the engravings in the *Endless Quilt*.

What was once hidden away has now been re-surfaced and presents significant life memories, bringing the intimate family stories and the past back into the living present, to the everyday.



Figure 6-22. Forlano, Penelope. *The Unforgotten* (detail) 2013.
Photograph by Eva Fernandez, courtesy of FORM.

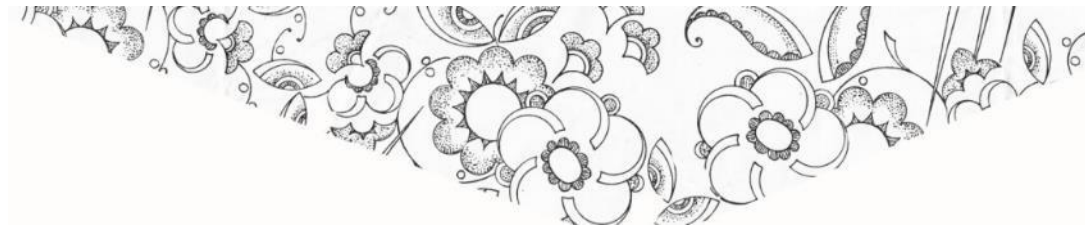


Figure 6-23. Faerna, Maruja Rodriguez and Penelope Forlano. *Embroidery illustration*. Scanned and recomposed illustration by Maruja. c 1949, composition 2013.



Figure 6-24. Faerna, Maruja Rodriguez. *Maruja's lacework* c1949.
Photographed and prepared for engraving by Forlano, Penelope, 2013.

The work does not gain its meaning through physically presenting or being a container for personal things; the inalienable and precious things are presented anew and embedded within the artefact. This contemporary object takes on both the inalienable character of the original decomposing or fragile artefact, and provides the opportunity for new, richer meaning within its new context, meaning that extends the life of the artefacts.

Materialisation of Design for Empathic Visual Relations

Separating the artefact from the container component to 'raise' it up, as a plinth raises a statue, denotes importance. By using characteristically different materials, the separation of the elements becomes distinctive. The base is visually diminished by being open, contiguous and visually light, in contrast to the 'container' which is solid, voluminous and implies heaviness. The metal legs subtly reflect the surroundings' colour, again to diminish its presence, while the timber container with its decoration at the smallest scale, to the CNC machined pyramid components, and the overall form cutaway at base corners, demand attention and focus.

The timber component is characterised by solid, premium quality materials to evoke high exchange value, but the rarity and authenticity is materialised through the bespoke detailing and form, to incorporate further potential attachment determinants, such as individual narrative (and the associated custodial ritual) or product knowledge (and the curatorial ritual); but the memories are literally represented, to capture opportunities for 'recovery ritual' by others outside the kinship group if the piece is not wanted by immediate family.

The Unforgotten invites long term custodianship through beckoning the viewer into the intricate surface detailing and encouraging the interpreter to cognitively attempt to construct its meaning, run their eyes and skin over the seemingly disparate representations, and engage in a conversation with the owner or a future custodian.

This bespoke piece is designed to maximise the factors affecting the enduring person-object relationship by being both personal and intimately connected, and highly crafted to evoke authenticity and irreplaceability (through uniqueness), as noted in Table 5-2. However, as this shuts out many consumers and perhaps is the easy answer, I then sought to create furniture that was entirely machine-made and DIY to address this gap.

6.3 SUITE OF COMMUNITY ARTEFACTS

A series of public artworks integrated into architecture, and thus considered built environment artefacts, were undertaken. The goal was to explore the significance, viability and potential influence the developed framework may have on designing for a wider group than a family, and beyond the domestic to the public space, and if this may feed back into the framework development through the creative process.

Each commission was appointed to me via a competitive submission process with real deadlines, budgets and participants, to test how the thinking may be applicable commercially. The first, *From the Skies*, was commissioned privately by the Perth Airport. The second and third projects were commissioned by government departments for secondary public schools. Selected images from the design process and construction are included in Appendix I.

6.3.1 FROM THE SKIES, PERTH AIRPORT

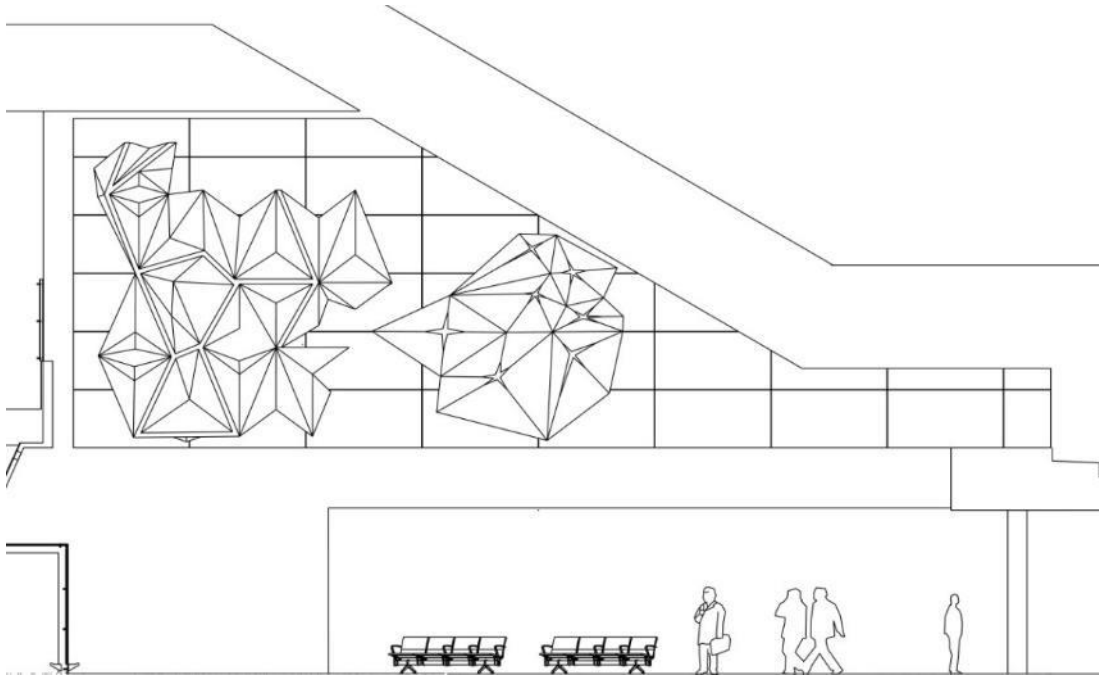


Figure 6-25. Forlano, Penelope. *From the Skies*, public art sculpture/acoustic wall, elevation (diagram), 2015.



Figure 6-26. Forlano, Penelope. *From the Skies*, public art sculpture/ acoustic wall, overall view, 2015.

Acoustic sculptures - Dimensions: 6,200mm W x 6,200mm H x 500mm D and 5,200mm W x 4,300mm H x 430mm D. Materials: WA blackbutt veneer, fibreboard, LED lighting, aluminium. Fabricator: Composite Components.

Acoustic wall - Dimensions: 20,250mm W x 6,850m H x 18mm D (90 sqm). Materials: Two-pack enamel, medium density fibreboard, aluminium. Fabricator: Décor Systems. Photo by Robert Frith of Acorn Photography courtesy of FORM and Perth Airport.



Figure 6-27. Forlano, Penelope. *From the Skies*, (detail of perforations and quote), 2015. Photo by Robert Frith of Acorn Photography, courtesy of FORM and Perth Airport



Figure 6-28. Forlano, Penelope. *From the Skies* (detail), 2015.

Photo by Robert Frith of Acorn Photography, courtesy of FORM and Perth Airport.

Moving outside of domestic consumption goods and into a public space, this work needed to communicate to a vastly diverse cultural group, including over four million international passengers per year that pass through the gates (Perth Airport, 2017). This artwork also functions as an acoustic wall installation, diffusing and reflecting sound through the faceted surfaces, perforations and acoustic baffle behind.

This is the first artwork one encounters after leaving the international customs area and entering the arrival hall, as a profound introduction to 'this place'. Furthermore, it is located above the seating area where locals may spend hours waiting for arrivals, offering long-term visual interest with layers of detail to discover, as well as immediate graphic impact for those passing through rapidly.

Design for Aging of Symbolic Meaning

Australia has the oldest living culture in the world, and the specific location of the Perth Airport is originally a part of Munday Swamp, a significant Aboriginal site (Register of the National Estate 2015). Artefacts found here have dated Aboriginal occupation of this site for at least 38,000 years (Larkin 2013c; Yates 2014). The work references the uniqueness of place and activities of this ancient culture to connect to enduring symbolic meaning that has shifted little over time. It references the common mythology of the constellations of Orion and Pleiades (the Hunter and the Seven Sisters), storytelling under the stars, stars as navigational tools and the unique animals of the area which have special significance to the Aboriginal people (see Appendix I for further information). The symbolism is drawn from distant and deep time of land formation, stars and culture, spanning millennia. In this way, the symbolic function of the work will likely have enduring meaning over its anticipated minimum 50-year life span⁴².

Materialisation of Design for Interaction, Embodied Spirituality and Community Connectedness

Community participation as collaborative and co-authored in the public art sector is widely debated (Bishop 2012). What I seek to explore here is the professional's role in creating built environment artefacts that connect to community beyond the participating individuals.

⁴² This expected life-span was a requirement of the artwork stipulated by the Perth Airport. The timber elements are able to be dismantled in parts off the mounting track for relocation if needed. The work is part of the Airport's art collection and is part of a maintenance regime to maximise its lifespan.

For *From the Skies*, I selected key community leaders, including the *Perth Airport Aboriginal Partnership Group* (with the assistance of the Perth Airport) and Doolan Leisha Eatts, through the assistance of the South West Aboriginal Land and Sea Council. The partnership group has a direct kinship linkage to ancestors who lived off the land prior to the establishment of the airport. They shared their ancestral and recent elders' stories with me to understand the site's history. Through this process I could gather information that involves these individuals yet extends beyond to others. I discussed my ideas with them to ensure cultural sensitivity and gain their approval for the overall design. The work references the traditional totem animal of an Aboriginal group, and animals that are endemic to the area that represent spiritual meaning within wider Aboriginal culture. The process enabled me to create a work that embodied Aboriginal spirituality and connectedness to the local Aboriginal community.

Materialisation of Design for Narrative, Kinship, Liveliness

I also spoke to respected Whudjuk/Piblemnan/Nyungah woman elder Doolan Leisha Eatts, because of her direct linkage to ancestors that encountered the first English colonists, and her kinship stories. Eatts provided a quotation that linked the conceptual ideas of the artwork directly to the Nyungah people, and this was commissioned as part of the project. The text is large and easily legible, perforated into the white acoustic panelling (Figure 6-27 to Figure 6-28). It reads:

'At night again and again, my elders used to tell us dreamtime stories, they used to show us the stars...' by Doolan Leisha Eatts (nee Garlett Yarran).⁴³

This enabled a direct community voice to be heard to evoke a liveliness. It simultaneously stimulates viewers' thoughts on the linkages between the text, the entire work, the community, and place more generally. In this way, the work most directly tells a narrative and thereby evokes a *relational anthropomorphism*; a 'stand in' for a person making a verbal statement. This intends to stimulate all English speakers to understand the story being told throughout the work. This aspect of the work also provides direct evidence of connection to community and an individual's story.

⁴³ "A *Whudjuk/Piblemnan/Nyungah woman elder (2014)*. *Doolan Leisha Eatts is a well-respected Nyungah elder that tells the stories of her people that are millennia old, as well as that of her ancestor's direct contact with the first Europeans to sail the Swan River/*Derbarl Yerrigan*. The text was commissioned by the artist for inclusion in the artwork." (Forlano, 2016. Paragraph 6)

Materialisation of Design for Community Connectedness

Animals, land formation and star references provide another narrative referencing both Noongar (Nyungah) and Western mythology, thereby connecting disparate cultural backgrounds to the same artwork, maximising its potential meaning to a wide community.

The intention with this artwork is to allow a multiplicity of interpretations based on one's own experience. If one is unfamiliar with one element, for example the constellation expressed in the two timber elements (Figure 6-26), other elements begin to inform the viewer of the significance of this place, such as the perforated representations of local animals. The layering of symbolism offers the opportunity for a broader audience connection, and to cognitively engage as one recognises more elements of the artwork. Its meaning and interpretation can grow richer over time.

In reflection, the combination of surface patterning (in the perforations), form and large text enables a broad audience to engage with the work. The text in particular is useful to those less familiar with constellations or art interpretation. The embedded lighting (as described in the appendix) work well to draw attention to the work and signify its importance as a focal point in the space. The representations in the perforated surfaces become more obvious upon closer inspection and act on the audience to 'feel into' the artefact.

6.3.2 KALEIDOSCOPIC WAVE, FREMANTLE COLLEGE

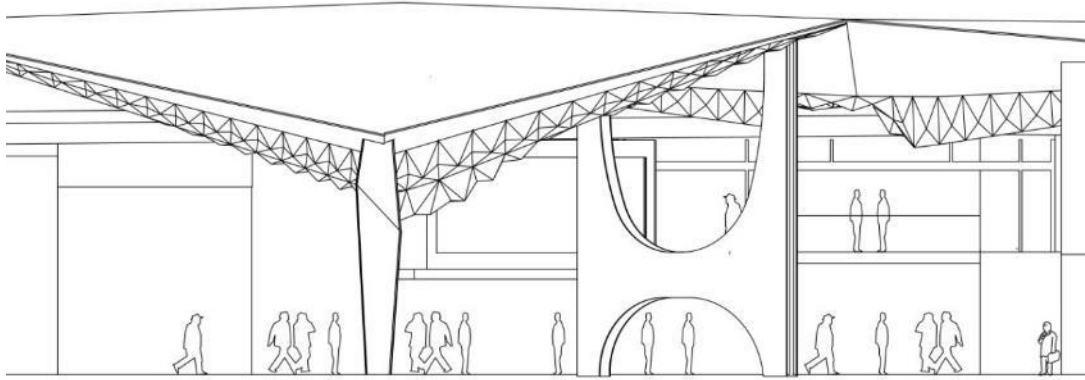


Figure 6-29. Forlano, Penelope. *Kaleidoscopic Wave*, Fremantle College. Elevation drawing, Forlano, 2017.

This soffit design was commissioned as part of a new school upgrade including performance spaces (Figure 6-29 to Figure 6-32). This undercover area would be a secondary performance space, meeting and social space, and for the community's weekend craft and farmer's market; the project brief called for a 'kaleidoscopic' mirrored installation. This provided a unique opportunity to explore community participation through engagement with the reflections, and seeing self and others in the surface of the work.

Due to the school's specialist range of maritime teaching programs, its location within a region significant to Aboriginal culture for its wetlands, and the proximity to the local beach and port activities, the artwork aimed to reference water. The soffit was designed to be entirely reflective and evoke a rippling ocean surface. The forms suggest waves or swells, with an aperture through one to mimic the sunlight piercing the water's surface.

Materialisation of Design for Community Connectedness, Interaction and Enchantment

While building a sense of community can occur through co-design or co-production strategies, I sought to explore a way in which future users could feel continued interaction with the work. Here *design for interaction* takes another perspective through ongoing and even unintended interaction with the work, as the continuous reflections through movement create a performative surface to engage the users over time.

The work captures the phenomenon of the moment and its physical location. Segments of people and the place are fractured, repeated and reassembled across the highly-polished stainless-steel surfaces (Figure 6-30 to Figure 6-32). Faceted panels capture

and reflect back snippets of the place and people in real time, with the intent to create engagement and enchantment. The work intends to engage and *draw in* the audience to create new memories about this place. Its complexity, scale and precision aim to evoke some wonder and enchantment in the technology and making of the work. The surface becomes 'performative' as it appears to change and move when the viewer is walking through, thereby forming a feedback loop with the viewer to interact with it.



Figure 6-30. Forlano, Penelope. *Kaleidoscopic Wave* (partial view eastern side), 2017.

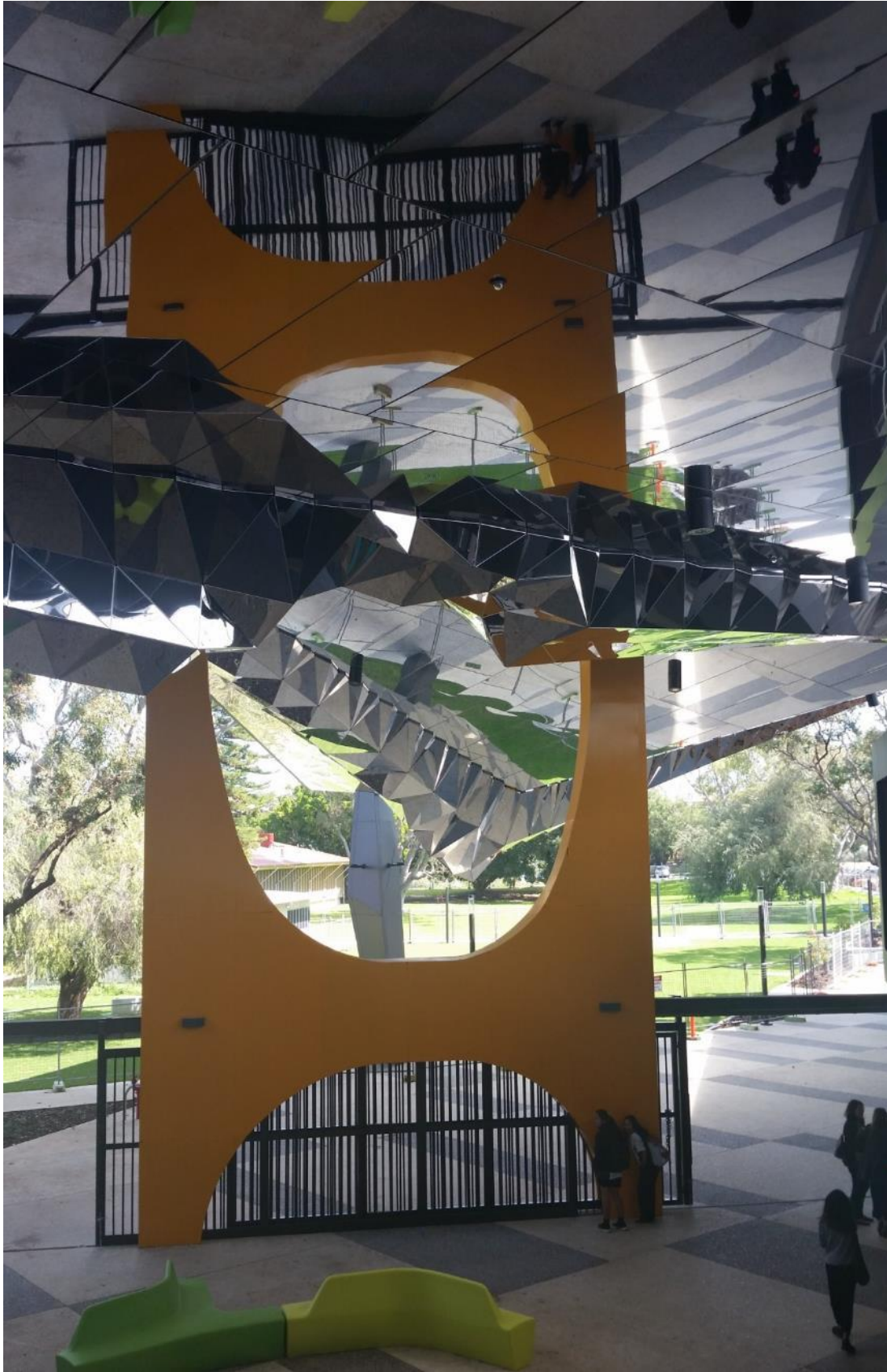


Figure 6-31. Forlano, Penelope. *Kaleidoscopic Wave*, 2017.

Dimensions: 30,100mm W x 3,600m H x 2,600mm D and 29,000mm W x 5,800mm H x 4,600mm W (approx. 200sqm) Materials: Highly polished 1.2mm stainless-steel sheet and stainless-steel rods and fixings, sub-frame galvanised steel.



Figure 6-32. Forlano, Penelope. *Kaleidoscopic Wave* (west end), 2017.



Figure 6-33. Forlano, Penelope. *Kaleidoscopic Wave* (view up through skylight), 2017.

Materialisation of Design for Symbolic Aging

As referred to above, the design refers to enduring concepts related to landscape that are unchanging. The artwork would still remain relevant if the school were to no longer offer specialist maritime studies. The stainless-steel panels to the soffit also pay tribute to Fremantle's architectural and industrial heritage, from shipbuilding to the decorative pressed tin ceilings of nineteenth century interiors and verandas, thus connecting it to enduring references to place to enable positive future association and symbolic aging.

Generative computer modelling programs (Rhinceros 5.0, Grasshopper and Solidworks) and current digital fabrication techniques were used to laser cut and fold the stainless-steel sheet to create a work evocative of the current technological era, which further acts as a marker of time and provenance.

Materialisation of Design for Material Aging

The materials and fabrication methods enable minimal maintenance due to the high polished finish on the stainless steel. This surface minimises the potential for tea staining. Additionally, being outside of human reach at six metres above ground at its lowest point, it will retain the finish for over 30 years, with limited opportunities for damage. It is constructed of large (9m x 3m x 3m) stainless steel only components that

can be removed via 6 -10 fixings. This incidentally enables ease of future recycling, if required.

Materialisation of Design for Performative Interaction

The mirrored surface also enables a performative interaction with the work. Reflecting upon this, I noted that the mirrored surface gave the illusion of appearing further away after the protected covering was removed, by exaggerating the distance between the audience and the faceted, undulating surface, with less opportunity for a performative interaction than I had anticipated. However, informal discussions with the school reflect that it has been well received by the students and staff, and although there is some level of engagement, it is perhaps less than had been anticipated.

This distance to the soffit was outside of my scope in the project; had I been able to extend the work vertically or at human eye level, there would be more opportunity for user engagement.

The first three works thus far have triangular faceted forms. The *Endless Quilt* and *The Unforgotten* were intentionally developed to be mnemonic of quilting. As these projects were then used to present the idea of fragmentation and assemblage of stories to the client, the commission was based on that aesthetic. *From the Skies* follows the same path. Although it was initially unintended, *Kaleidoscopic Wave* again followed this path.

Creatively, I wanted to step away from the triangular facets to explore other ideas. However, this faceted exploration was an exploration at different levels and scales; in *The Unforgotten* it is a surface, in the *Endless Quilt* it is a driver for modules, with hinged forms to transform its shape, and *Kaleidoscopic Wave* embodied swelling forms at a large scale, creating fractured reflections, evoking water surface and an overall twisting and in *From the Skies* it evokes typical visual representations of constellations and is symbolic of typical star shapes.

6.3.3 MARRI-KINGIA PAST, BYFORD SECONDARY COLLEGE

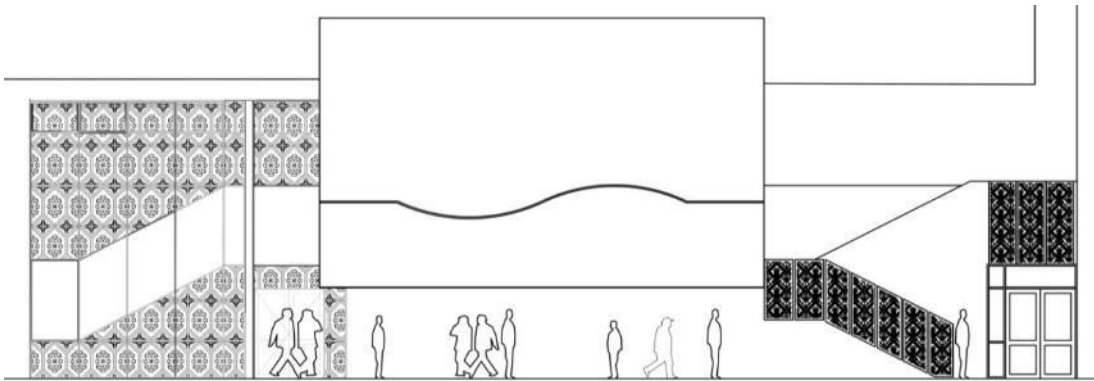


Figure 6-34. Forlano, Penelope. *Marri-Kingia Past* series for Byford Secondary College. Elevation diagram, 2016.

The construction of the final stage of Byford Secondary College included offices and teaching spaces for senior students. The commissioned Percent for Art installations for the previous construction stages of the college celebrated the teaching activities, and the site's recent history in the twentieth century as farmland. To build upon this narrative of place, I looked to the more distant past, to expose the Aboriginal story and the impact of colonisation of the land.

For millennia, the Byford site was occupied by Noongar Aboriginals, with a Marri-Kingia ecology prior to land clearing. This ecology is dominated by the *Marri* (*Corymbia calophylla*) tree and the *Kingia Australis* grass tree. For the indigenous people, this ecology was rich in medicinal *kino* (or gum/resin) from these two dominant plant species. This distinct ecology is now endangered and restricted to a small *Forever Bushland* site as its last and only place of preservation (Department of the Environment 2017). My works aim to recall and restore this almost forgotten memory for the next generation.

Materialisation of Design for Narrative and Community Connection.

The fully integrated public artworks *Pugin's Trellis of Marri-Kingia Creatures* (Figure 6-37) and *Pugin's Trellis of Marri-Kingia Insects* (Figure 6-34 and Figure 6-36) include a patterned façade (frit glass) and balustrade respectively. The pattern layout and design echo the geometry and aesthetics of Augustus Pugin's wallpaper *Trellis* (Figure 6-35) popular in domestic Australian residences in the mid-nineteenth century (Historic Houses Trust, nd.).

My design substitutes the English floral motifs for insects of the *Marri-Kingia* ecology (Figure 6-38), interpreted through contemporary materials and technology, including laser-cut aluminium balustrade (Figure 6-39 to Figure 6-40) and white ceramic bonded onto the glass panes of the façade to act as screening (Figure 6-41–Figure 6-42).

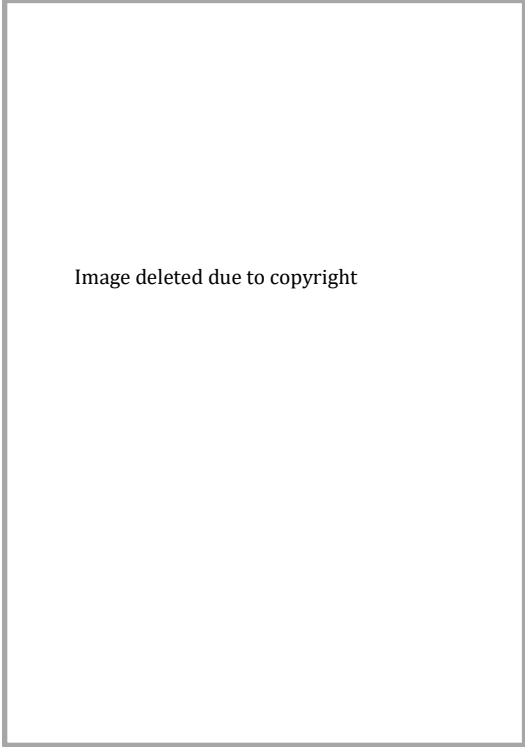


Figure 6-35. Pugin, Augustus. *Trellis*, c1874 (1980's reprint).

Figure 6-36. Forlano, Penelope. *Pugin's Trellis of Marri-Kingia Insects*, partial shop drawing, 2016.

Source: Historic Houses Trust. Accessed 13 May, 2015, <https://www.hht.net.au/research/library>

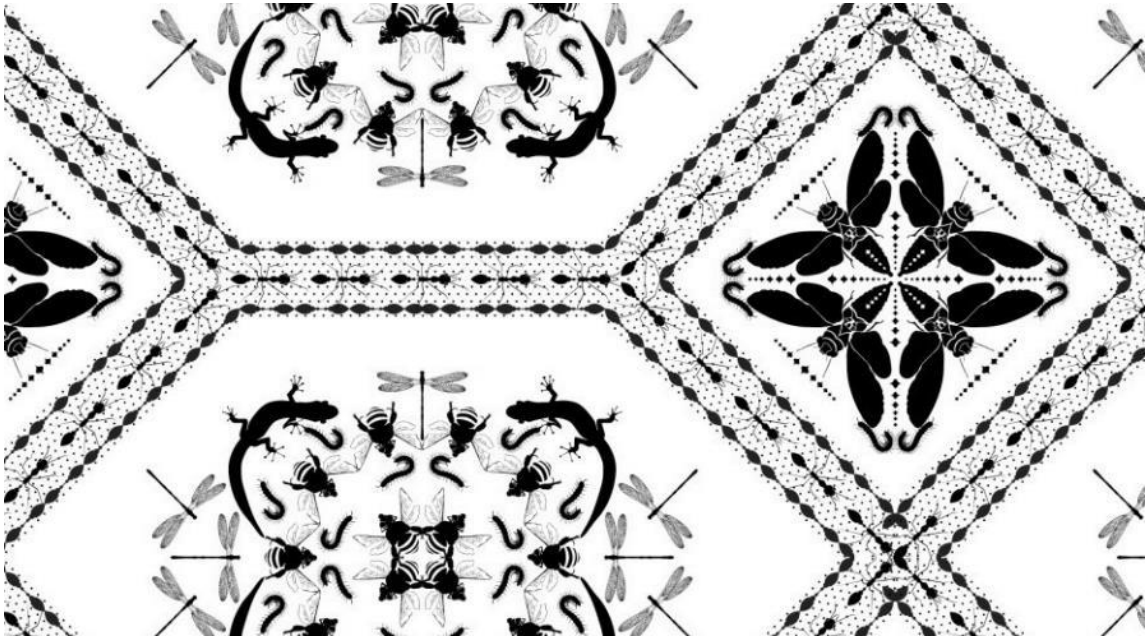


Figure 6-37. Forlano, Penelope. *Pugin's Trellis of Marri-Kingia Creatures* (repeat pattern), 2016.

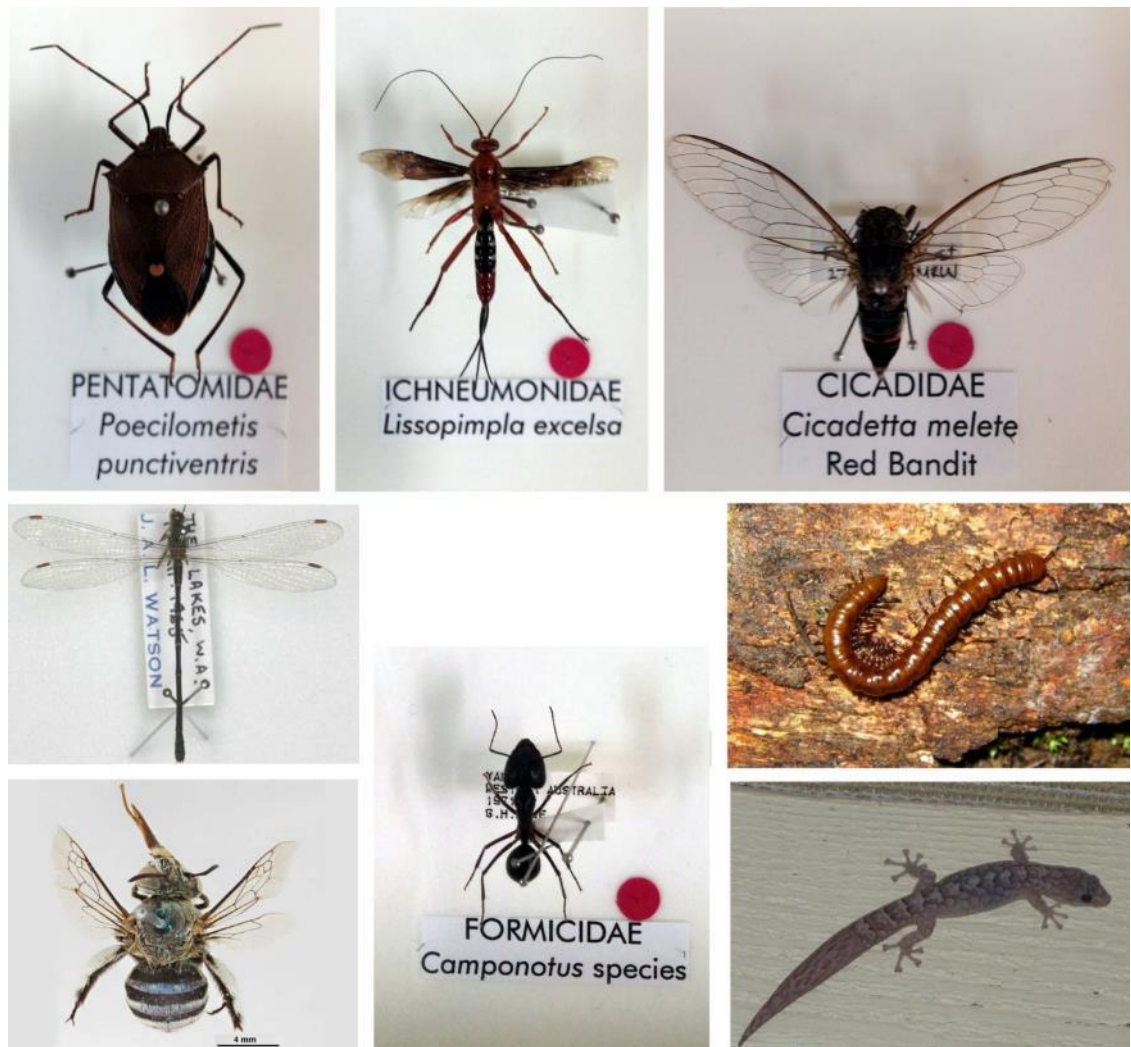


Figure 6-38. Fauna of the Marri-Kingia Ecology (photographs) WA Museum, 2016.

Clock-wise from Top Left:

Pentatomidae, *Poecilometis punctiventris* (Needle Bug). WA Museum, 2016;

Ichneumonidae; *Lissopimpla excelsa* (Local Wasp). WA Museum 2016;

Cicadidae; *Cicadetta melete* (Red Bandit Cicada). WA Museum 2016;

Antichiropus variabilis (Marri Keeled Millipede) Source: museum.wa.gov.au Accessed 28 January, 2016, <http://museum.wa.gov.au/explore/articles/meet-marri-keeled-millipede>;

Christinus marmoratus (Gecko prolific to Perth region, incl. Marri tree) Source: museum.wa.gov.au;

Formicidae, *Camponotus* species (Common WA metropolitan Ant) WA Museum, 2016;

Amegilla chlorocyanea (Blue-banded bee). Source: Department of Agriculture. Accessed 28 January, 2016, <http://www.padil.gov.au/pollinators/pest/main/138580>;

Australestes aleison (Western Ringtail Dragonfly). WA Museum 2016.

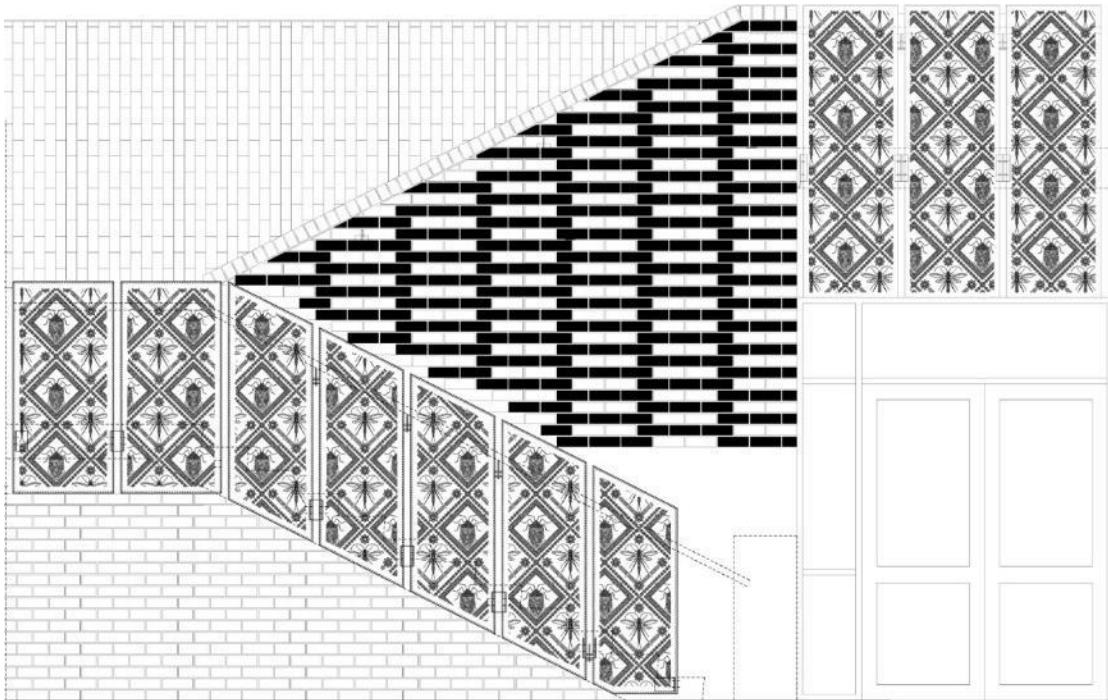


Figure 6-39. Forlano, Penelope. *Pugin's Trellis of Marri-Kingia Insects*, presentation drawing showing each individualised pattern integrated into the architectural elevation, 2016.

Dimensions (overall): 8,170mm W x 5,110mm H x 1,200mm D

Materials: 6mm thick CNC laser cut, folded, and powder coated aluminium.



Figure 6-40. Forlano, Penelope. *Pugin's Trellis of Marri-Kingia Insects*, balustrade installed. Forlano, 2017.



Figure 6-41. Forlano, Penelope. *Pugin's Trellis of Marri-Kingia Creatures* (façade viewed from exterior), 2017.

Dimensions: 8,400mm W x 7,400mm H x 12mm D (glass thickness).

Materials: Ceramic bond printed (*frit*) laminated glass.



Figure 6-42. Forlano, Penelope. *Pugin's Trellis of Marri-Kingia Creatures*, façade viewed from interior, 2017.

This work is a visual reminder of what has been lost through colonial occupation of the land and the importance of care and custodianship. Through this approach, the narrative established by the other public artists has now been expanded upon to be inclusive of the distant absent landscape. This creates a level of engagement, contemplation and it is hoped an *enchantment of technology*, to use Gell's term, to enable the viewer to decipher and consider the meaning within the work.

Materialisation of Design for User Interaction and Enchantment

The particular species selected are the now silenced, disappeared and largely forgotten previous occupants. Through repetition of the insects, it is intended to trigger the visible and audible sensations of a mass of crawling and buzzing creatures. This approach aims to create a level of empathy for and connection to the environment, create a reminder of its loss and need for custodianship, through mnemonic interaction. Although the surface may not be physically touched, the mass of visual creatures that appear to be crawling along or flying onto the glass can trigger this memory.

Reflecting on the outcome, the scale of this project enabled me to reflect upon how to interact through use with an artefact that is large, not able to be held, manipulated or possessed. Approached from a distance, the aforementioned patterns are read from the dominant local culture, that is European or English. Yet in a somewhat subversive or surprising way, the pattern is revealed to be less comfortable and familiar; not flora at all. Upon closer inspection, the graphics reveal estranged creatures that once inhabited this place. It is through this visual interaction and change of distance, that engagement can occur with a static object.

Viewing from the inside, the façade patterning created an unanticipated relationship to the site. The indigenous insects and creatures representing the past become large and overlaid on the seemingly small buildings, with the views of contemporary architecture in the distance. The new landscape and its past inhabitants are seen together, with roles reversed, as the insects dominate in size from this perspective (Figure 6-43).



Figure 6-43. Forlano, Penelope. *Pugin's Trellis of Marri-Kingia Creatures*, (detail of façade viewed from interior), 2017.

Similarly, the screen and soffit component of the series, titled *Marri Healing* (Figure 6-45 to 6-47), celebrates the Aboriginal use of the land which is now absent. It becomes more obvious upon multiple visits, rather than revealing its narrative immediately, to prolong the engagement and discovery, as the text incorporated into the soffit is intentionally discrete. It reads: *Marri, the Noongar medicine tree*. This provokes the students to consider the history of the landscape and previous inhabitants.

The Marri (translated to blood in the Noongar language) provides *kino*, which is a red gum which seeps from the trunk, and has been used as an antiseptic and pain reliever by the Aboriginals for millennia (South West Aboriginal Land and Sea Council, 2012). The screen is visually reminiscent of the bark's physical form and of the seeping *kino* (Figure 6-44). The splitting, bleeding and tearing pattern within the screen also reinforces the sense of loss, removal and absent history, inviting the viewer to consider their custodianship role in maintaining community stories, and create intergenerational connections.



Figure 6-44. Forlano, Penelope, 2018. *Detail of Marri tree bark and kino* (photograph).



Figure 6-45. Forlano, Penelope. *Marri Healing* (soffit), 2017.
Dimensions: 9,030mm W x 1,965mm D. Materials: 4mm thick powder coated aluminium.



Figure 6-46. Forlano, Penelope. *Marri Healing* (soffit detail), 2017.



Figure 6-47. Forlano, Penelope. *Marri Healing*, Corten steel screen and soffit, photo by Douglas Mark Black, 2017.

Screen materials: 5mm thick Corten Steel, galvanised fixings to concrete footing.
Dimensions: 5,800mm W x 1,950mm H x 100m D.

Materialisation of Design for Liveliness and Material Aging

As in *From the Skies*, text is used to directly make clear the link between the narrative and the design, particularly to those who are unaware of Noongar customs. The work acts as a human other, using words to tell the story.

Scratching into the surface to graffiti, as students tend to do, will over time, be covered over by the natural rusting surface of the Corten. This enables students to make their mark, yet it can also be removed by time and nature, as if the screen has its own agency, and thus can be somewhat lively. This constant material change by students and nature intends to provoke questions of ownership and custodianship of place, not just in the here and now, but ever-changing through time; a fusion of generations within one work to evoke intergenerational identity.

The public projects have raised questions about how users uncover meaning in the works. Examining audience feedback through qualitative and quantitative research, particularly at the schools, where the audience engages frequently with the works, would be worthy of future research.

6.4 DOMESTIC ARTEFACT 3 & 4: *EN-CASE* AND *FOR NOW, FOR ALL-WAYS*

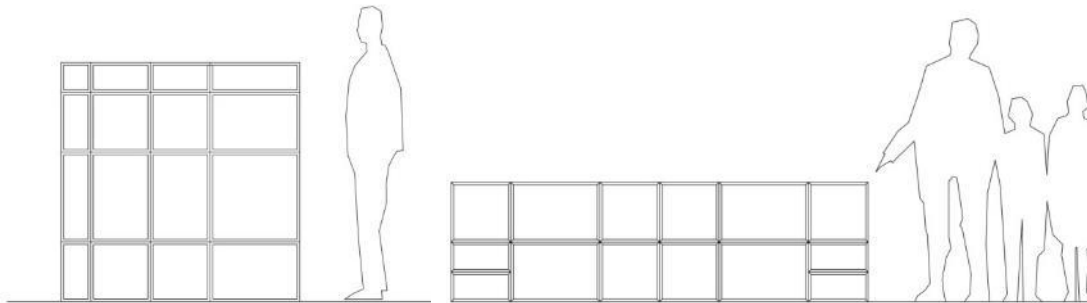


Figure 6-48. Forlano, Penelope. *Encase*, elevation, 2015-16.

Figure 6-49. Forlano, Penelope. *For Now, For All-ways*, elevation diagram, 2016-17.

Encase Design Registration Number: 201613566 issued by Australian Government Dept. IP Australia. IP Design Registration period: 06 July 2016 - 06 July 2021 (see Appendix D)
IP Right Certified on: 03 November 2016 (see Appendix D)

The *Encase* prototype (Figure 6-48) and subsequent iteration, *For Now, For All-ways*, (Figure 6-49), build upon the explorations of previous projects in regard to materialisation of surface narrative, modularity, and evolving transformation and kinship to demonstrate a lower cost scenario of possessor participation.

When consumers purchase items that are perceived as high cost, particularly with a craftsman's investment of effort and time, these items are often better cared for because of the financial investment. This project then asks, how can designers use affordable, everyday materials and manufacturing processes that minimise specialist craftsman labour; that is, an alternative to the IKEA offering, to create an emotionally enduring, every-day, useful, domestic, self-assembly artefact? The prototypes explore scalability, meaning-making through co-participation, and realising the surface potentiality of otherwise ordinary materials.

Firstly, I will discuss the prototype design, user interaction and its problems, and then the subsequent revised proposition.

***Encase* brief**

The intention was to create an offering halfway between middle-market identically produced furniture and high-cost commission-based furniture. The brief was to create a form with minimal production processes to reduce cost and handling, with the

uniqueness primarily in the surface personalisation. *En-case* was conceived as a potentially commercially viable product, necessitating product differentiation and licensing through Design Registration. A unique design joinery detail machined by CNC was designed to create differentiation, a sense of precision and quality crafting, while being scalable and repeatable. The forms are modular and edges flush, to be stacked in a limitless number of storage and/or room-divider arrangements (Figure 6-50 to Figure 6-52).



Figure 6-50. Forlano, Penelope. *En-case*, storage; 2015-16.

Configuration dimensions: 2,775mm W x 1,295mm H x 450mm D. Materials: Valchromat (low VOC high density fibreboard, organic dyed fibres), walnut timber veneer on plywood, PVA, Danish oil and cabinetmaker's wax. Fabrication process: 3 Axis CNC router cutting. Surface treatment: Laser engraving.



Figure 6-51. Forlano, Penelope. *En-case*, storage, 2015-16.

Configuration dimensions: 2,940mm W x 1,665mm H x 450mm D.



Figure 6-52. Forlano, Penelope. *En-case*, low configuration storage 2016.

***En-case* Fabrication**

Typical 3-Axis CNC overcut tenon joints (exposed divots) or edge-lap joints (Figure 6-53 and Figure 6-54 respectively), aesthetically imply imprecise and ‘cheap’ making and disposability. My design instead aimed to create a more refined and crafted solution with flush joints via a 9mm diameter typical router and a 4.5mm ‘rounding-over’ router bit (Figure 6-55 and Figure 6-56), yet still authentically machine-made. This solution is two-fold, reducing labour costs while maintaining aesthetic preconceptions of quality making (that is, no gaps or overlaps as shown in Figures 6-55 and 6-56) and to maximise stacking ease.

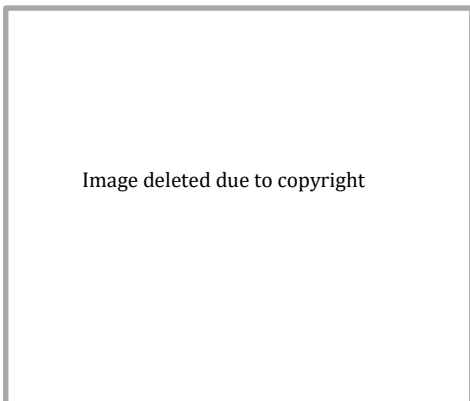


Figure 6-53. Meier, Mark. Typical 3-Axis CNC tenon joints (closed and open), n.d. Posted: 24 August, 2014. Accessed 16 June, 2015, <http://mkmra2.blogspot.com.au/2014/08/cnc-cut-wood-joinery.html>

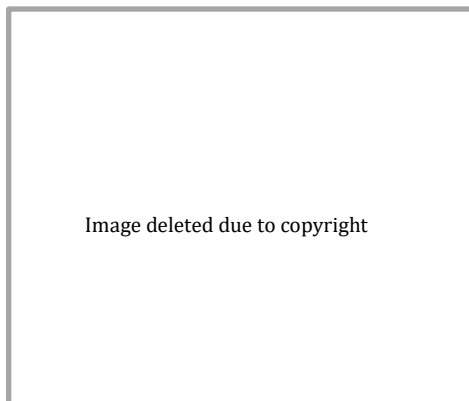


Figure 6-54. Fuzil, Denis. *Kuka chair*, n.d. Source: OpenDesk. Accessed 16 December, 2017, <http://ockhm.com.au/opendesk-1/>

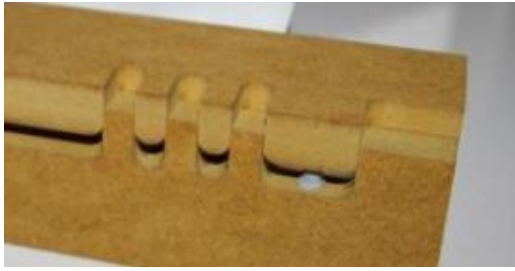


Figure 6-55. Forlano, Penelope. Detail of partially closed joint prototype, 2015.



Figure 6-56. Forlano, Penelope. Detail of closed joint of *En-case*. 2015.

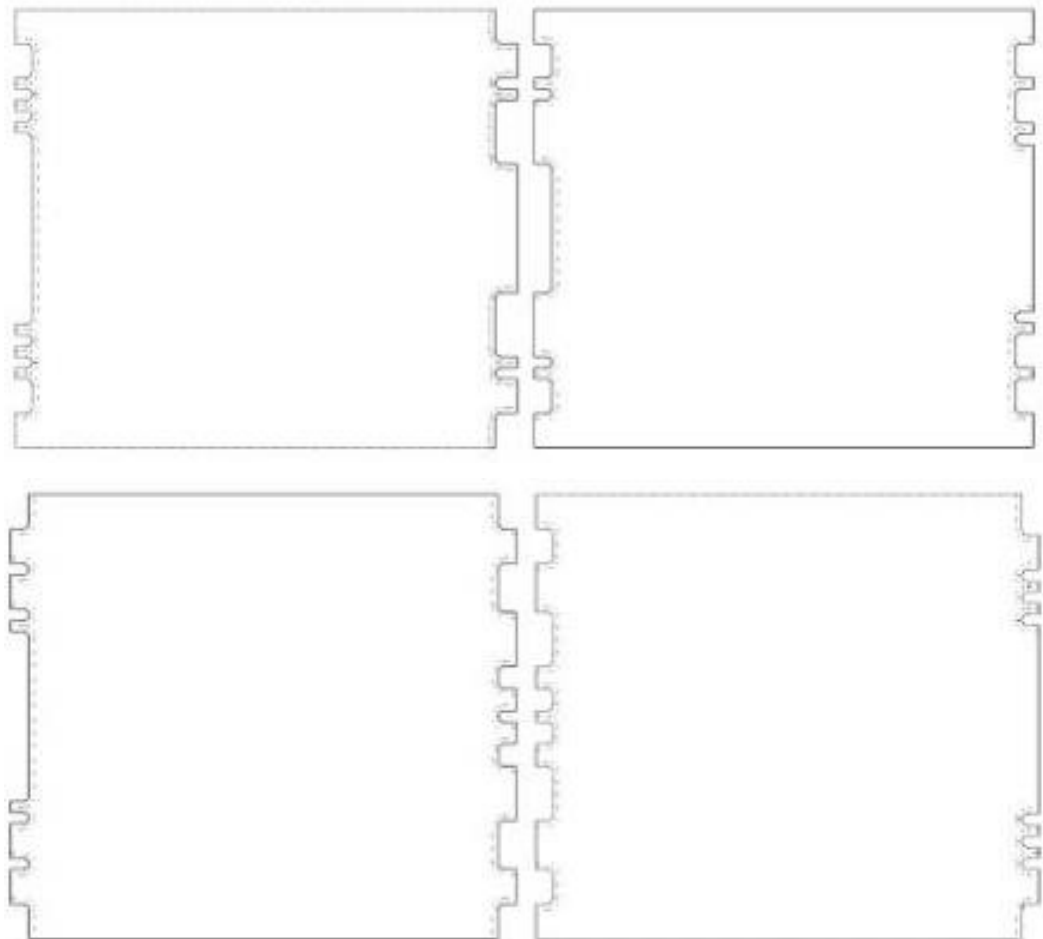


Figure 6-57. Forlano, Penelope. Drawing: Four unique junctions to *En-case*, 2016.

Each junction is a unique configuration of 'fingers' to simplify the DIY assembly. With only one assembly form possible, it ensures the correct faces, with any co-created patterning, are assembled without necessitating visual or textual instructions, nor requiring disassembly if errors are made (Figure 6-57).

The artefacts were to be used as a room divider and storage by the client. The carcass with the rounded over CNC joints was made of High Density Fibreboard, Valchromat™ due to its consistent colour, excellent machining properties, moisture resistance, higher mechanical strength and resistance to bending (Investwood n.d.). The material is also recyclable, and is E1 and CARB 2 Certified. The superior consistent material thickness

from an engineered HDF also ensures the accuracy required for the CNC machining of the detail (as shown in detail, Figure 6-56)

Rear panels slide into a square rebate and are made of 6mm veneered plywood with engraving on one face to reflect kinship narrative. The engraved face is exposed on whichever side the end user decides to display it. After the panels were completed, the male adult of Family A agreed to complete the assembly. Instructions were supplied on how to glue the joints and seal the surfaces. During a follow-up discussion and visual inspection some months later, it was revealed that the end-user did not glue the panels together correctly nor seal the surfaces for fear of damaging the product. The client applied too little glue to avoid clean up and or spill over of the glue onto the visible areas, and failed to adequately seal the engraving timber because he didn't want to change the timber or engraving colour, and wanted to be 'extra careful' to not dirty the surface (Family A, pers. Comm., February 2017).

Further to this, one 'box' was used as a coffee table, (which was not anticipated) and the timber surface had a patch of colour change from UV light exposure and shade from an object placed long-term on the surface (pers. obs., July 2017). Spilt liquid had evidently collected on the surface by the reveal from the side panels, caused some minor swelling to the improperly sealed plywood (pers. obs., July 2017). Reflecting upon this, user participation needed to be less subject to error.

For Now, For All-ways (FNFA) brief

The brief for the subsequent iteration thus acknowledges that although physical making participation elicits connection to artefacts, it should not be a priority and risk negatively impacting upon the quality of the fabrication or design.

The surfaces must be pre-sealed for users, junctions should be such that less skill is required, and the assembly self-evident, viewed more so as an Open-source product for amateur makers rather than the broad public. Further consideration was also given to the artefact being used in further, unexpected circumstances (multi-stability).

Although 'halfway'⁴⁴ and customised products are not new, I focus on personalisation that supports attachment and meaning-making, primarily through a surface pattern that is custom designed and applied professionally (by artist, designer or graphic design and

⁴⁴ Fuad-Luke explains "[i]n a 'halfway' product the designer/ maker/ manufacturer only takes the product so far, leaving a space for the user to complete the making" (Fuad-Luke 2009, 95).

engraving service) specifically for a consumer. Interpreting kinship stories into a visual that can be integrated into the surface customises the artefact in a personal way yet uses professional skills to ensure a quality outcome. Incidentally, it creates an entirely new employment opportunity for illustrators, designers and artists.

The intended emotional endurance of the design lies not in typical Western notions of beauty, proportion or completeness, but instead through its experience, incompleteness and interpretation. The employed fabrication methods and materials explicitly seek to address the enduring in non-typical means, that is through common, low exchange value materials embedded with visual storytelling of personal history.

FNFA fabrication and assembly

For Now, For All-ways, (2017) is constructed of European Birch plywood (plantation timber), nylon cord, and finished in water-based polyurethane and similarly to *En-case* is modular and adaptable (Figures 6-58 to 6-63).



Figure 6-58. Forlano, Penelope. *For Now, For All-ways*, 2017.

Materials: European Birch plywood (plantation timber), nylon cord, water-based polyurethane.



Figure 6-59. Forlano, Penelope. *For Now, For All-ways*, (example arrangement), 2017.



Figure 6-60. Forlano, Penelope. *For Now, For All-ways*, (example arrangement), 2017.



Figure 6-61. Forlano, Penelope. *For Now, For All-ways*, (example arrangement), 2017. Forlano, 2017.



Figure 6-62. Forlano, Penelope. *For Now, For All-ways*, (example arrangement), 2017.



Figure 6-63. Forlano, Penelope. *For Now, For All-ways*, (example arrangement), 2017.

During the development of the *En-case* product I attempted to create a removeable fixing to enable individual panels, rather than entire 'boxes' to be replaced as required. However, this was never entirely successful for various reasons, it was decided that the best solution at that stage was to retain the unique finger detail and glue the joints. But it was clear from testing with Family A that self-assembly of this nature by the end user was still too open to error, and the boxes should be supplied to consumers prefinished, by an open-source manufacturer.

Glued boxes results in entire boxes being replaced if only one panel is damaged, if a surface treatment is no longer desired, or its meaning changes negatively for the user. Thus, the *FNFA* variation aimed to create a lower cost option and one that enabled client self-assembly and replacement of individual panels or reconfiguring of sizes with a simple, tool-less assembly method, with less room for error (Figure 6-58 to Figure 6-64).

My proposition features the mitre joints with CNC routed slots to two or three sides, with a supplied cord for lashing. This maximises assembly flexibility and replacement of parts. The lashing slot is made with a 3mm router cutter on a CNC machine which is widely available, and the CAD files can be open-source, enabling localised production. The cord is a low cost 3mm diameter nylon cord available for about AUD \$0.30 a metre.

The simplicity of the panel cutting offers a more viable option to seamlessly add or replace parts, as each panel has the same lashing detail and 45-degree mitre. Lashing

instructions and a crochet needle to assist the pushing through of the cord through the slot (if needed) can be supplied by the manufacturer. The only possible difficulty I can perceive would be in the end user ensuring there is sufficient tension, however it is as simple as tying shoe laces tightly (Figure 6-64).

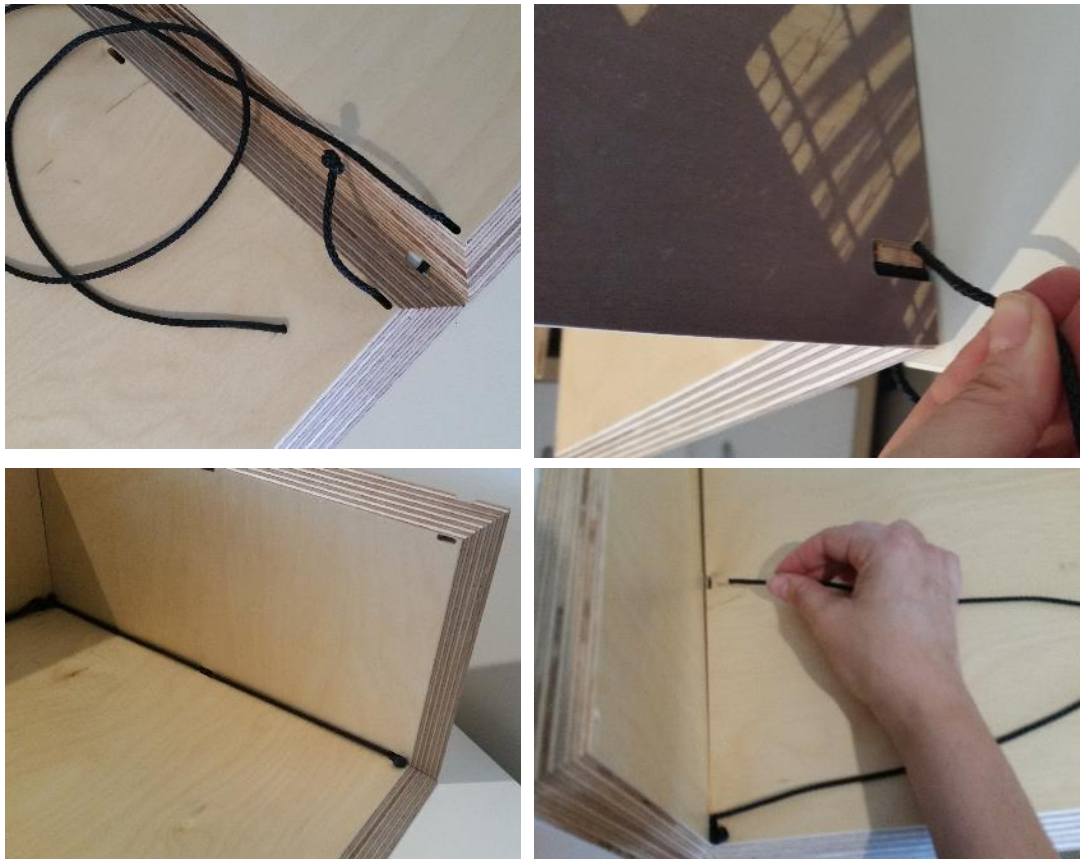


Figure 6-64. Forlano, Penelope. *For Now, For All-ways* assembly process (clockwise from top left) 2017.

Manifestation of design for evolving physical reappropriation and interaction

This product goal is to have customisable depths, heights and widths, surface treatment and cord colours upon request via an online platform. The standard depth would be 370mm. The units prototyped are modular in multiples of 185mm, that is, 185mm, 370mm and 555mm to both the height and width, with flush surfaces allowing the cubes to be configured with maximum flexibility. The components include open units (up to 370 x 185 x 185mm only) and closed-back cubes, soft and hard planes, and an optional base. This 185mm module enables standard stacking heights to meet ergonomic requirements, that is, to align with standard work-desk height of 740mm, and 925mm for use as a bench or 1110mm as a credenza or higher as shelving (Figure 6-65 to Figure 6-52).

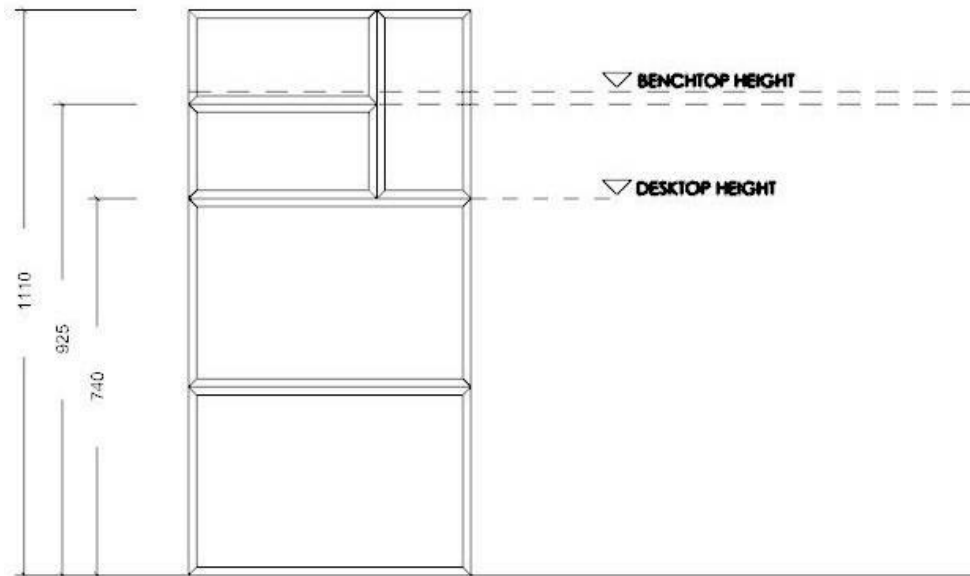


Figure 6-65. Forlano, Penelope. Drawing showing heights, 2017.

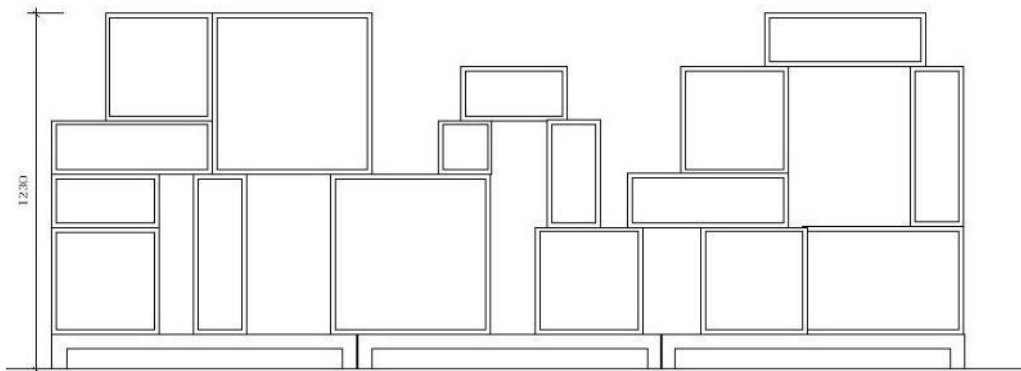


Figure 6-66. Forlano, Penelope. *FNFA* diagram, example of long credenza style configuration with base, 2016.

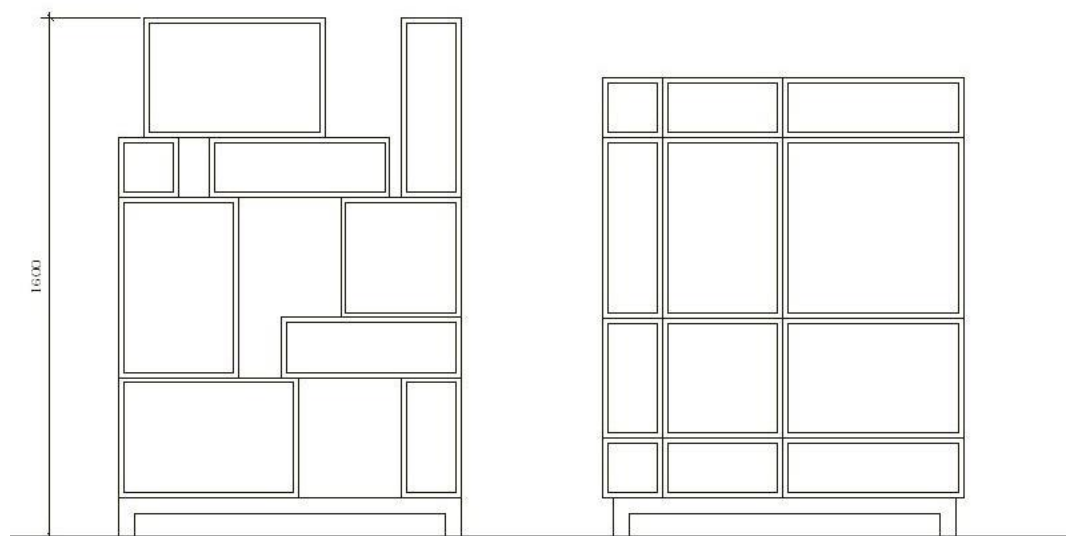


Figure 6-67. Forlano, Penelope. *FNFA* diagram (examples of possible configurations, medium height with base), 2016.

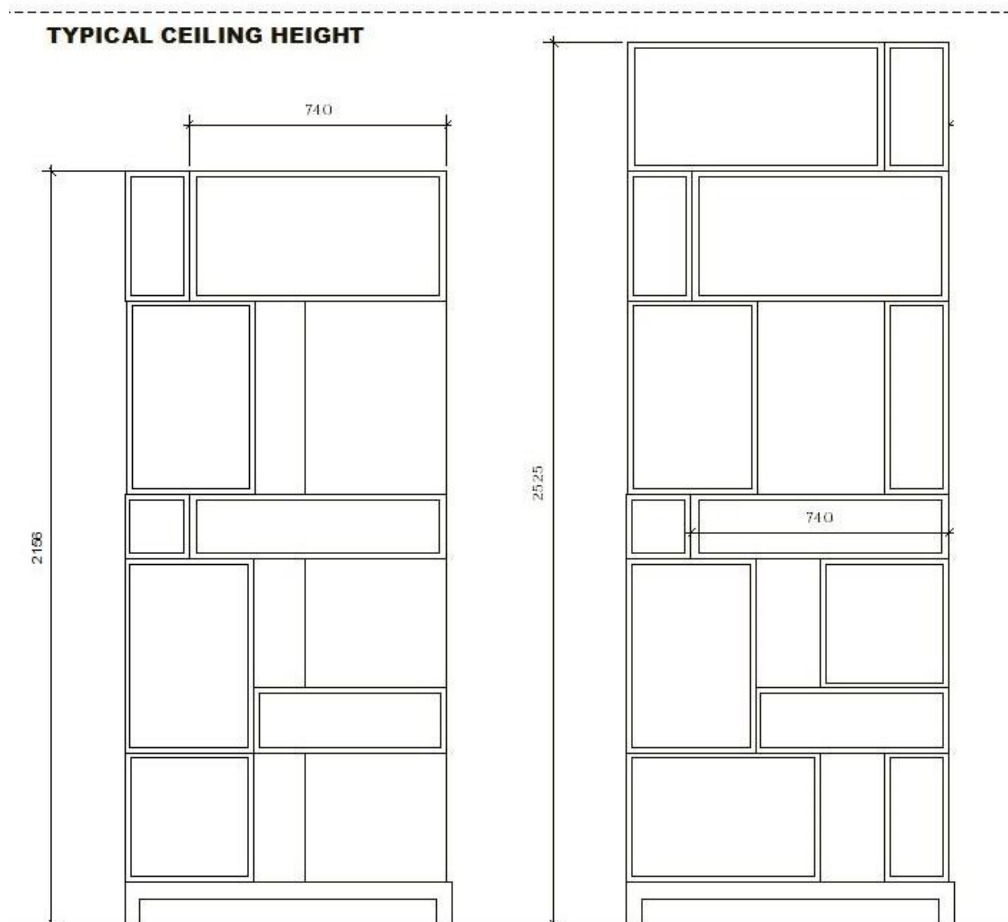


Figure 6-68. Forlano, Penelope. *FNFA* diagram, corner configuration with side facing units or all units facing one way, with bases, 2016.

An online parametric ordering system allows for customisation, but depths are recommended to be 370mm for standard shelving. In this scenario, a plywood panel of 740mm or wider can be lashed to two back-to-back open storage units to act as a work or bench surface⁴⁵.

Individual or multiple units can also be upturned as side/coffee tables. The evolving physical reappropriation of use and arrangements combined with the ease of disassembly and replacement of parts empowers the possessor to control its use to suit changing needs indefinitely.

Although not prototypes, planar surfaces include soft wool mats (as a seating mat or to assist in floor levelling), and hard planes as a benchtop that can also be lashed to open

⁴⁵ It is acknowledged that extensive choice often immobilises a consumer against purchase, due to the complexity of making the best or correct decision. This phenomenon is typically referred to as the “paradox of choice” (Kinjo and Ebina 2015). Despite the extensive choice available it is expected that in practice, the website and/or a service to be facilitate choice would be enabled by an online or local designer.

backed units. The design directly engages the possessor to determine use and visual exposure of the decorative surfaces.

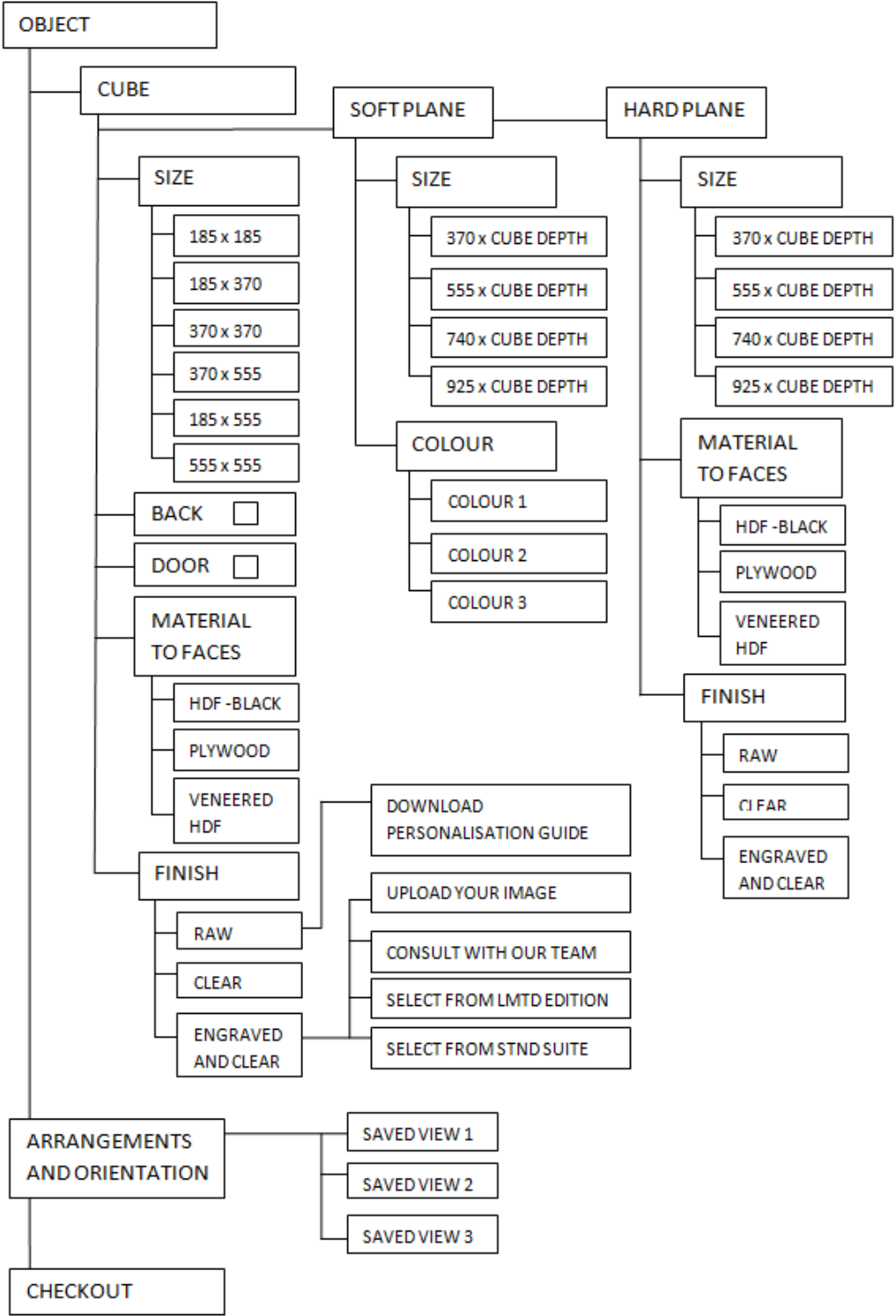
In the long-term scenario, the units are of manageable sizes and easily transported, and can be used during the transportation process as containers. Units can function independently in separate rooms, or broken down and passed onto others when downsizing. This negates the need to discard the entire collection due to changing lifestyle or needs and for passing on to multiple heirs, similarly to the *Endless Quilt* range.

The designs can provide a range of price points. It is proposed that through the online store, customers have a customisable, on-demand offering available for collection from a local manufacturer, as the manufacturing requirements are simple for any cabinetmaker. At the most cost effective, an unfinished and simple mitred unit can be supplied as a self-assembly flat-pack, maximising DIY opportunities of self-finishing options. At the other extreme, a highly decorated, pre-finished version with customised or limited-edition engravings by a well-known artist or designer is possible. This maximises the audience range and enables the work to 'grow' with the user, their life circumstances and changing tastes.

Table 6-1 indicates a proposed online ordering map from the selection of part type, with customisation enabled through the configuration, size, colour and finishes. This process would allow a multitude of options, a DIY guide for how to prepare surfaces for custom paint finishes etc. The user could then download the open source information for localised production to minimise transportation costs, or place orders from a central maker. The *FNFA* prototype demonstrates the plywood option, however the HDF and veneered board as shown in the *En-case* prototype are equally possible, providing a wide range of material and quality options.

The online presence could also include a community page to encouraging the uploading of individual solutions, how users have arranged and used it in their house, akin to an online forum or IKEA hack style site. This form of participatory engagement enables rich experiences to fit various personalised, financial, spatial and aesthetic needs, and facilitates future adaptation.

Table 6-1. Indicative online customisation and ordering map



Although this proposal is similar to existing online opportunities, for example, *NOMI* Australia, (Figure 6-69), and *OpenDesk*, UK, (Figure 6-70), I believe that my option is novel in design, as it provides an extensive range of customisation, material choice and custom surface patterning.

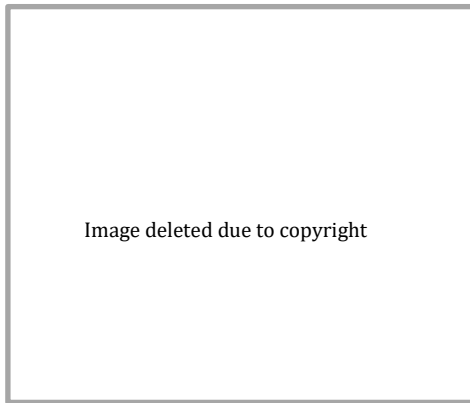


Figure 6-69. Typical example of the NOMI on-demand ordering website.

Source: NOMI. Accessed 13th August 2016, <https://app.nomi.com.au/design-studio/add/design/2742>.

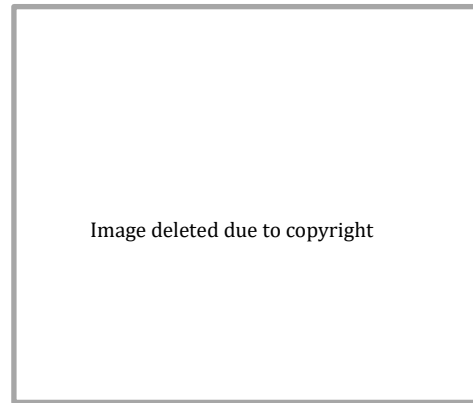


Figure 6-70. Typical example of the AtFAB open source ordering website.

Source: AtFAB. Accessed 13th August 2016, <http://atfab.co/?portfolio=90-minute-lounge-chair>.

This offering thus provides more opportunities for attachment, personalisation and uniqueness. Furthermore, other design offerings rarely allow for multi-stability, that is, for objects to be used in a variety of ways; typically, products are designed for fixed function, which, as speculated in Chapter 5, may explicitly encourage premature obsolescence and drive increasing profits for manufacturers and or designers.

Reappropriation is built into the very form and intent of the *FNFA* product to encourage object longevity over manufacturer profits. However, the involvement of surface design can provide a new income stream for designers and artists through direct commissioning, limited edition, or standard designs, which offer a design royalty or other payment form.

The kit of parts invites the possessor to be critically engaged in the appropriation of the object at various stages, from the co-design of component selection, determining its functional use and arrangement, co-participation in surface choices and making, and transfer to others. In the case of *FNFA*, the DIY assembly and ability to exchange and replace or renew individual parts increases this engagement.

Manifestation of design for aging of symbolic meaning

The surface finishing remains integral to my exploration of the emotionally enduring quality of these products. The *FNFA* prototype explores digital printing, as it is becoming increasingly more widely available and is reducing in cost. Faster, lower cost engraving was employed to create a subtle yet still personal and symbolic meaning.

The surface treatments of the *FNFA* are subtler, to reflect the ephemerality of memories, as well as materially more superficial, so it may be sanded off and removed if meaning changes and/or it is no longer desirable.

Manifestation of design for narrative (*En-case*)

The design process for both projects included interviews to ascertain significant meaning for the families; samples and process drawings were shared with the families to gain feedback, with subsequent feedback attained after use in the home (Appendix A). In this section I will discuss both the *FNFA* and *En-case* approach, as these surface treatments are independent of the construction type.

In contrast to mainstream contemporary design, which largely ignores the personal, my shift to the narrative based and highly communicative surface provokes individualised interpretation, challenging the viewer to understand it beyond the merely visual categorisation of style or trend. The engravings and patterns aim to capture these idealised memories. Through customer interviews, patterns with symbols that trigger memory create the surface treatment designs.

In the *En-case* prototype, Hong Kong was a special place for the clients and was interpreted to capture the mood of their experience of hurriedness and density. This is captured in the graphic 'Hong Kong Skyline' developed specifically for the family, (Figure 6-71 and Figure 6-72).

Similarly, reflecting the clients' memories of making stainless glass windows, living and working in New York city, and their religious beliefs, a hybrid pattern was developed. It encompasses the New York city library ceiling details, rose windows, and cruciform elements (Figure 6-73 and Figure 6-74).

The 'London' graphic was specifically developed to include buildings of personal relevance. The graphic is a repeat of views of significant buildings from their office windows, sightseeing venues with their young children, the façade of their apartment

block, and streetscape of their favourite place to spend their weekend leisure time (Figure 6-75 and Figure 6-76).

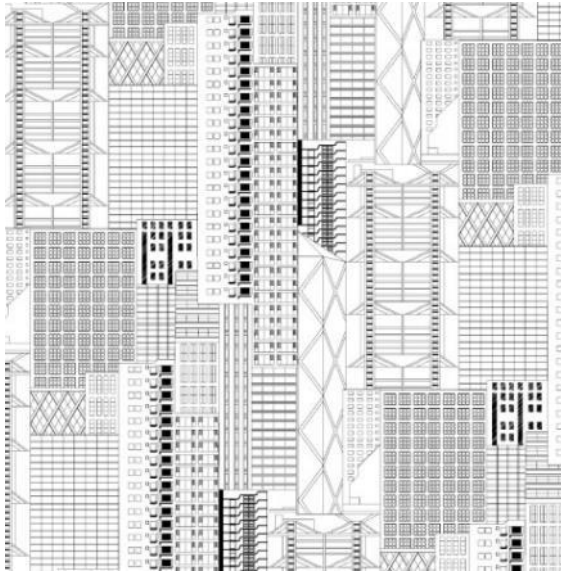


Figure 6-71. Forlano, Penelope. *Hong Kong Skyline*, graphic, 2016.



Figure 6-72. Forlano, Penelope. *Hong Kong Skyline*, graphic engraved onto Walnut timber veneer, 2016.

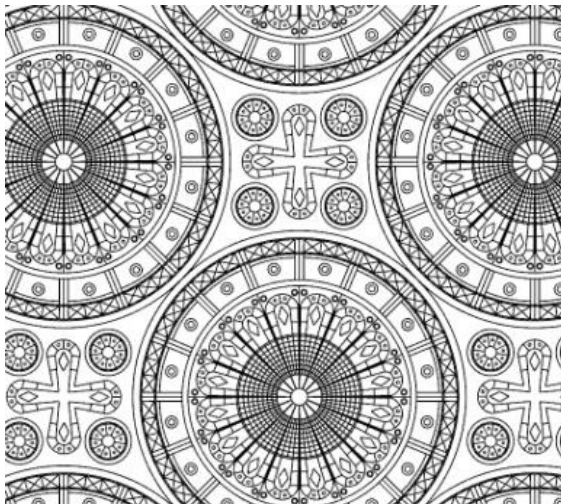


Figure 6-73. Forlano, Penelope. *NYC*, graphic, 2016.



Figure 6-74. Forlano, Penelope. *NYC*, graphic engraved onto walnut timber, 2016.

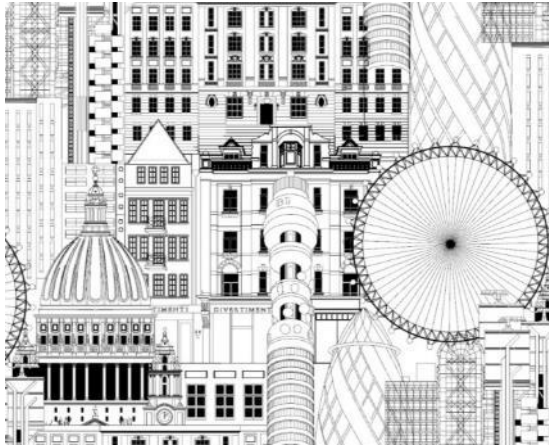


Figure 6-75. Forlano, Penelope. *London*, graphic, 2016. Note: repeat pattern shown.



Figure 6-76. Forlano, Penelope. *London*, graphic engraved into white board, 2016.

The following pattern was developed from a patterned timber box the male received from his grandfather (Figure 6-77). The male talked of his joy as a child in hearing his grandfather's stories of travels and artefacts he brought home from distant, exotic places. This love of travel is carried through his family, and a specific timber box with intricate patterning received from his grandfather creates kinship connection for him. The *India* pattern was then developed from this artefact to reflect an evolution and transformation over time to evoke this evolution, yet continuity of kinship values and interests (Figure 6-78 and Figure 6-79).



Figure 6-77. Forlano, Penelope. Patterned box from India, n.d. Photo by client.

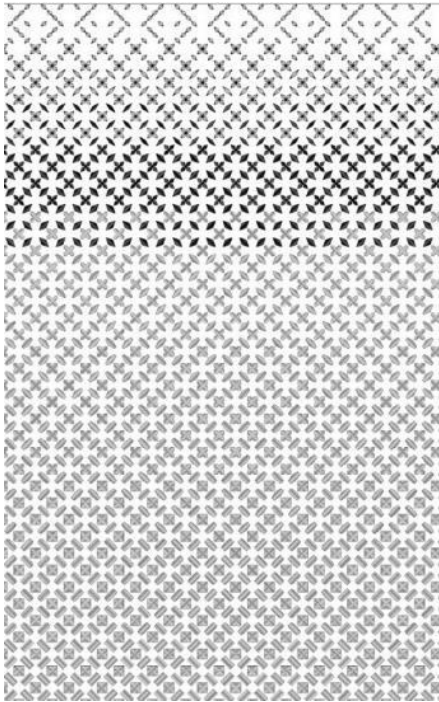


Figure 6-78. Forlano, Penelope. *India*, graphic, 2016.



Figure 6-79. Forlano, Penelope. *India*, graphic engraved into veneer, 2016.

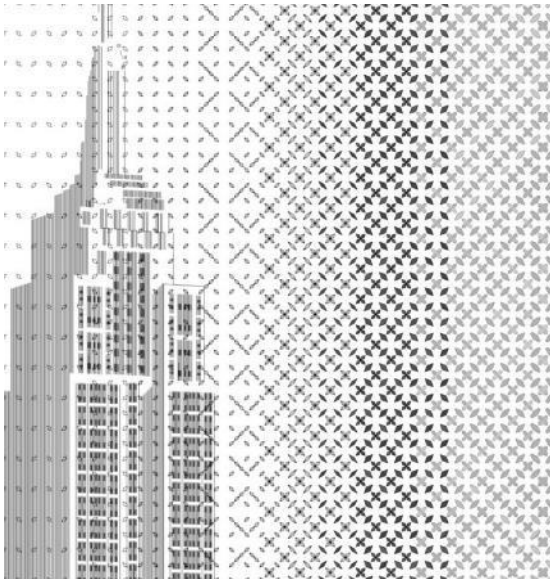


Figure 6-80. Forlano, Penelope. *India and Empire State Bldg.*, graphic, 2016.



Figure 6-81. Forlano, Penelope. *India and Empire State Bldg.*, engraved, 2016.

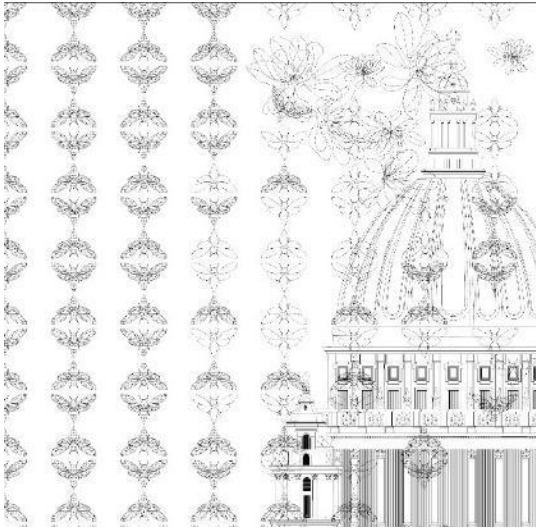


Figure 6-82. Forlano, Penelope. *St. Paul's and Perth bush*, graphic, 2016.



Figure 6-83. Forlano, Penelope. *St. Paul's and Perth bush*, graphic engraved onto veneer, 2016.

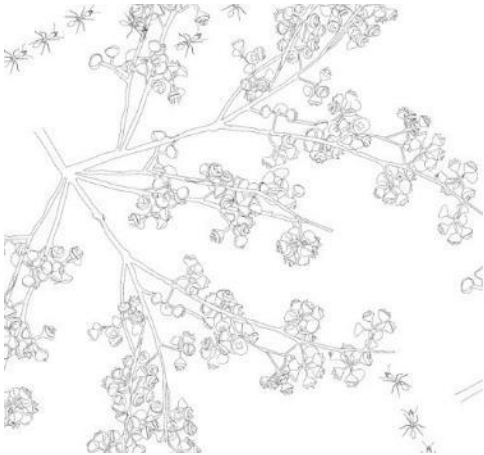


Figure 6-84. Forlano, Penelope. *Childhood memories of Perth bush (pattern cropped)* graphic, 2016.



Figure 6-85. Forlano, Penelope. *Childhood memories of Perth bush (pattern cropped)* engraved, 2016.

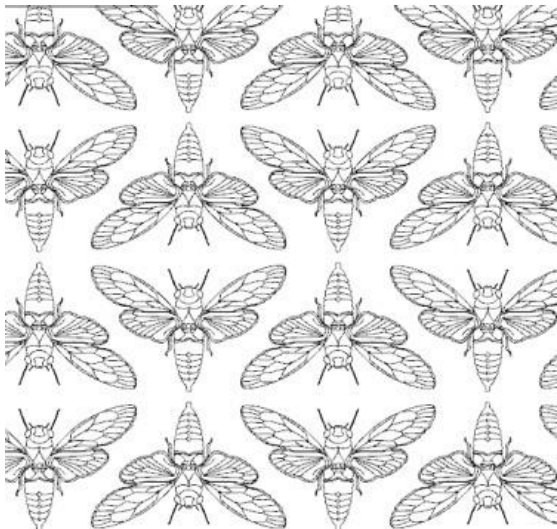


Figure 6-86. Forlano, Penelope. *Cicada Wall* graphic, 2016.



Figure 6-87. Forlano, Penelope. *Cicada Wall* graphic, engraved. 2016.



Figure 6-88. Forlano, Penelope. *Banksia, gum leaves and geckos*, graphic, 2016.



Figure 6-89. Forlano, Penelope. *Banksia, gum leaves and geckos*, graphic engraved, 2016.

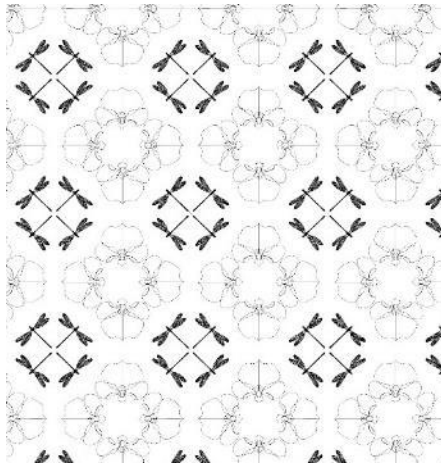


Figure 6-90. Forlano, Penelope. *Lobelia orchid and dragonfly*, graphic, 2016.



Figure 6-91. Forlano, Penelope. *Lobelia orchid and dragonfly*, engraved onto veneer, 2016.

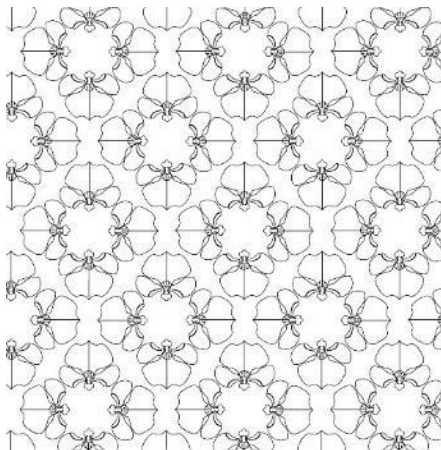


Figure 6-92. Forlano, Penelope. *Lobelia*, graphic, 2016.



Figure 6-93. Forlano, Penelope. *Lobelia orchid*, engraved onto veneer, 2016.

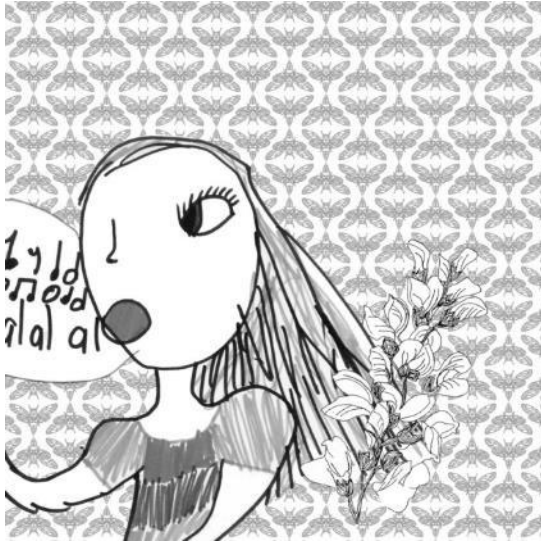


Figure 6-94. Forlano, Penelope (composition). *Three childhoods*, graphic, 2016. Note: incorporates hand illustrations by client.



Figure 6-95. Forlano, Penelope. *Three childhoods*, graphic engraved, 2016.

Other graphics combine these memories and interests to express their love of contrasts: contemporary city life with the love of distant places and connection to handcraft (Figure 6-80 and Figure 6-81); large cities and nature (Figure 6-82 and Figure 6-83), and childhood memories of the Australian bushland (Figure 6-84 to Figure 6-93).

Another engraving combined three childhood memories into one graphic, incorporating two family members' own drawings (Figure 6-94 and Figure 6-95). It is intended that this multi-voiced approach makes the intangible memories tangible, expresses individuals within kinship relations, and spurs opportunities to start a conversation with family members and/or close friends about these re-surfaced memories.

Further surfaces were engraved with images by two of the family members, the eldest daughter and her mother, expressing their love of drawing and creativity. Their drawings were of significant places, events or interests, and are illustrated below (Figure 6-96 and Figure 6-99).



Figure 6-96. 'Weekends in London', graphic. 2016
Hand illustration by client.



Figure 6-97. *Weekends in London*, engraving, 2016. Forlano, 2016.

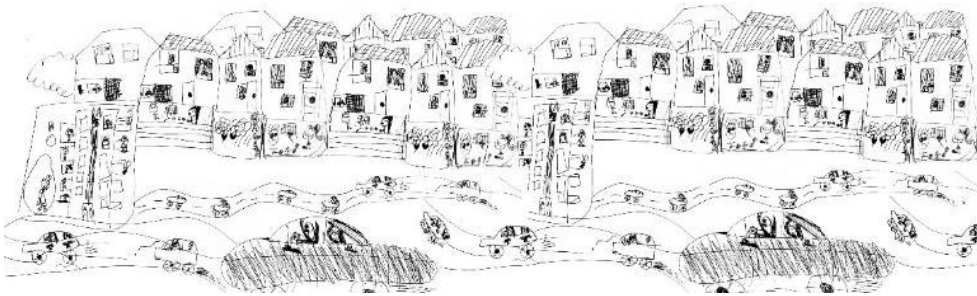


Figure 6-98. *JJ's London*, drawing. Drawing by client's daughter, recomposed and prepared for engraving by Forlano, 2016.



Figure 6-99. Forlano, Penelope. *JJ's London*, engraving, 2016.

Manifestation of design for narrative (FNFA)

In FNFA, the participant's responses about significant memories and family stories are captured in the digital printing onto the plywood, developed by overlaying multiple translucent images over one another. This includes photographs I shot to evoke childhood memories of walking through the Australian bush with her grandparents, and stories of 'Francis the donkey' (Figure 6-100 to Figure 6-104), recalling memories of visits to Sydney's St. Mary's Cathedral with her father (Figure 6-106 to Figure 6-112), and their children's childhood in the bush, beach (Figure 6-114) and climbing trees (Figure 6-117) and recent memories with her children such as their favourite place, Pedersen Creek, where her son's ashes are spread (Figure 6-118 to 173).



Figure 6-100. Forlano, Penelope. *Hot summer walk*, 2017.



Figure 6-101. Forlano, Penelope. *Hot summer walk*, digital print on plywood, 2017.



Figure 6-102. Forlano, Penelope. *Wanderings*, 2017.



Figure 6-103. Forlano, Penelope. *Wanderings*, digital print on plywood, 2017.



Figure 6-104. Forlano, Penelope. *Francis and Willy*, 2017.



Figure 6-105. Forlano, Penelope. *Francis and Willy*, digital print on plywood, 2017.



Figure 6-106. Forlano, Penelope. *St. Mary*, 2017.



Figure 6-107. Forlano, Penelope. *St. Mary*, digital print on plywood, 2017.



Figure 6-108. Forlano, Penelope. *City Walk*, 2017.



Figure 6-109. Forlano, Penelope. *City Walk*, digital print on plywood, 2017.



Figure 6-110. Forlano, Penelope. *Wrought*, 2017.



Figure 6-111. Forlano, Penelope. *Wrought*, digital print on plywood, 2017.



Figure 6-112. Forlano, Penelope. *Cathedral Stories*, 2017. Photos and composition



Figure 6-113. Forlano, Penelope. *Cathedral Stories*, digital print on plywood, 2017.



Figure 6-114. Forlano, Penelope. *Beaches and Caves*, 2017.



Figure 6-115. Forlano, Penelope. *Beaches and Caves*, digital print on plywood, 2017.



Figure 6-116. Forlano, Penelope. *Rainforest Tree Climbing*, 2017.



Figure 6-117. Forlano, Penelope. *Rainforest Tree Climbing*, digital print on plywood, 2017.

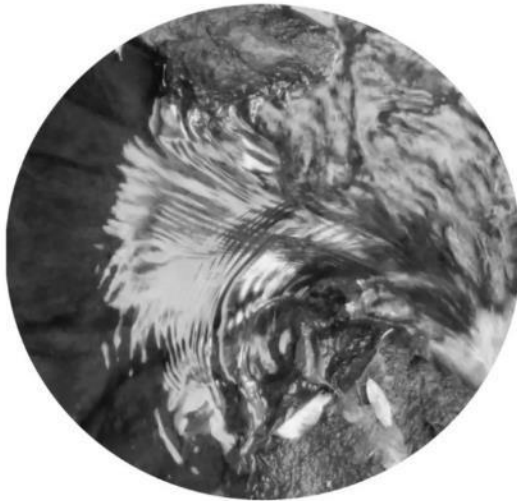


Figure 6-118. Forlano, Penelope. *Ripples*, 2017.



Figure 6-119. Forlano, Penelope. *Ripples*, digital print on plywood, 2017.



Figure 6-120. Forlano, Penelope. *Mary Mack, Mack, Mack...*, 2017.



Figure 6-121. Forlano, Penelope. *Mary Mack, Mack, Mack...*, digital print on plywood, 2017.



Figure 6-122. Forlano, Penelope. *Collective Memories*, 2017.

Note: composition by Forlano, photographic portions from Getty Images, participant and Penelope Forlano.



Figure 6-123. Forlano, Penelope. *Collective Memories*, digital print on plywood, 2017.

Some images represent collective memories of various things over time (Figure 6-122), while others (Figure 6-120) evoke a specific memory looking directly up to tree tops, with words from a nursery rhyme repeated, overlaid and mirrored to recall a particular time and action, as described in the participant's quote below:

We would swing from our knees... [on the bollards and see] the upside image of the world ... as we sang Ms Mary Mac [sic] again and again (Female participant, Family B, 2016).

Images appear on the exterior face, enabling the possessor to reveal or conceal the image, depending on their chosen placement. Circular prints (Figure 6-119 and 6-123) appear to have been protected over time, by a vase or a plate. It is as if the remaining surface has faded where it wasn't protected, leaving behind an imprint of memory on the surface.

The internal engraved patterning conceals or reveals memories through possessor interaction on a more frequent basis. Patterns engraved by laser respond to interaction in an even shorter time period, predominantly made of sparse, hair-thin lines which become more discernible when picked up by the light (Figure 6-124 to Figure 6-127). Certain references are camouflaged within the drawings and prints such as rosary beads amongst the jellyfish tentacles (Figure 6-125), the cassowary amongst the sunflowers (Figure 6-127), and the reappearing Willy Wagtail and frog. Octopuses are interlinked to appear as if dancing, evoking the quirky sense of humour of the family (Figure 6-128),

and patterns are overlaid with a pattern dot formation, referring to a recurring motif in the client's artwork (Figure 6-130).

This technique allows a constant state of revealing and concealing mnemonic references gained from the interview data, which may be obvious to casual observers or only noticed by people close to the family or spending more time examining the artefact's surfaces. Interview data of the family's valued time together is reflected, including underwater coral, sea creatures, growing sunflowers and produce, with a particular interest in the symbolism of the sunflower and Willy Wagtail bird.



Figure 6-124. Forlano, Penelope. *Ocean beads*, engraving on timber (angled view), 2017.



Figure 6-125. Forlano, Penelope. *Ocean beads*, engraving on timber (parallel view), 2017.



Figure 6-126. Forlano, Penelope. *Seeds*, engraving on timber (parallel view), 2017.



Figure 6-127. Forlano, Penelope. *Seeds*, engraving on timber (angled view), 2017.



Figure 6-128. Forlano, Penelope. *Dancing Octopi*, engraving on timber, 2017.



Figure 6-129. Forlano, Penelope. *Anemone Field*, engraving on timber, 2017.



Figure 6-130. (participant), Screen shot of a portion of participant's artwork, 2015.

The laser engraved patterns are developed from the participant's interview data, describing how they intentionally left urban life and immersed themselves in nature with their children, including the natural environment during their favourite past-times spent snorkelling, bushwalking and growing their own produce, to achieve a sustainable, off-grid lifestyle.

The surface treatment that has been applied reflects this restlessness of movement, to demonstrate a story still in motion, incomplete and ever-changing. So too does it reflect the bohemian lifestyle the participant experienced in the interviewee's two formative years. The splitting and shifting off-plane of the graphic engravings create heightened ambiguity and draw the viewer in to understand the composite meaning. Like the underwater family experience of snorkelling at reefs, the images are seemingly reflected off slightly misaligned planes. This further evokes the lifestyle of escaping the norm, or constraints of the past, traditional expectations, toward a nomadic, *living lightly* quality which they discussed in the questionnaire. The harshness of borders in the engraved patterns is dissolved, creating an open-endedness of opportunity and exploration.

For the first family, (*En-case*) the surfaces have distinctive, contained and clear patterning. For the second family (*For Now, For All-ways*) however, the surface treatment was intentionally fractured, and intentional breaking away from the past reflects their openness to new encounters and fluidity, the lure of the bohemian and an opposition to the hegemonic and fixed. The engravings are intended to seem to flow through and across the various surfaces, less bounded, repeating and overlaid, bleeding into one another in a more organic and less rigid format.

Design for interaction

FNFA explores interaction in a different way to the *En-case* engravings. Aside from the interaction through the interview process, choice of use, arrangement and material/colour choices, the completed work continues to reveal as one takes time to look into the surface in more detail. The surfaces' evocation of time and interaction is through image layering, subtlety and camouflage, creating an evolving, ephemeral memory, and through movement and angle of view. Through daily use, and moving of items stored within the furniture cubes, or more long-term use through reconfiguration, the surfaces are discovered and re-discovered.

Seeds and growth not only reflect their gardening interests, but also symbolise new beginnings, and reinforce the passage of time. In contrast to the first participating family (*En-case*) in which their clear kinship lineage and perceived stability of the past were communicated, this family directly referred to their desire to disconnect from the past, providing a balance for this research between a family wanting to keep the past alive, and another focused on creating new futures.

Due to the solidity of the material, the cubes can be sanded and renewed if so desired. New cubes can be added over time to appear congruous, as the overall design already consists of differing surface patterns, textures and qualities.

Blank panels can be intentionally left raw, unfinished and able to be disassembled, enabling direct participation by the possessors at a time that suits. As two family members are printmakers (Family B), it seems obvious that raw surfaces would encourage participants to create their own mark on the work, however this would likely not be a practical commercial scenario. Subtle or removeable decoration allows the various generations to directly apply their own creative contribution to the artefact.

En-case explores a combination of hard-line computer drawings by the designer with multiple layers of meaning and opportunities for interpretation, and hand sketches by the client, to create a dynamic outcome mixing new and older mnemonic references. The *FNFA* project instead aimed to explore narrative and kinship meaning in a subtler, more engaging and contemplative way, evoking a greater sense of discovery over time.

6.5 REFLEXIVITY AND REFLECTION ON CREATIVE PRACTICE

Reflecting upon the outcomes and theoretical readings, while considering my personal attitudes and influence, I will discuss the general findings and contributions enabled by the creative practice.

Reflexive practice

As discussed in Chapter 1, on *Gendered Practice*, it was very early in the research practice that I encountered a fundamental difference between my level of agreement with male and female authors, particularly in discourse associated with enduring design practice. I felt the need to maintain as objective a position as possible because the emotional and psychological endurance of artefacts is not exclusive to one gender.

However, as previously raised, the bequeathment and custodianship role of furniture in particular is typically the role of the female head of the household. My perspective as a female provides me with the opportunity to examine my gendered attitude as well as contribute the female perspective to the design discourse specifically pertaining to enduring artefacts that is predominantly male; that is, by the authors Alistair Fuad-Luke (2002; 2007; 2009), Stuart Walker (2002; 2006a; 2006b; 2010; 2011; 2014), Jonathon Chapman (2005; 2014), Ezio Manzini (1995; 2007) and Tim Cooper (2010a; 2010b).

This position may also be partly due to my focus on artefacts of the built environment, as compared to the discourse predominantly based on product design; however, it is also notable that there are the fewer female product design authors. The readings that most resonated with my thinking were disproportionately from female writers, particularly Giuliana Bruno (2002, 2014), Helene Cherrier (2010; Cherrier, Black, and Lee 2011; Cherrier and Ponnor 2010; Cherrier, Türe, and Özçağlar-Toulouse 2014), Susan Stewart (1993), and Jane Bennett (2009; 2001). Though their views do not feature heavily in the final exegetical text, it was clear to me that my views had aligned with these authors and was strongly present during my creative process thinking.

Due to the nature of working on real projects, clients had appointed me based on my previous work, with expectations of similar aesthetic outcomes. I consciously sought to turn away from the faceted aesthetic, in particular after *Kaleidoscopic Wave*, to show my capacity for scope and diversity in form and aesthetic. Although I don't believe this had negative consequences on the design outcomes, it was certainly an external and personal influence.

Additionally, as my design background is based on producing construction drawings for builders and makers, with less designer-maker practice, my creative works also reflect this. Although crafted and handmade artefacts can be enduring and may be commercially viable, I have explicitly focused on artefacts using relatively new, efficient, and commercially pervasive machinery in the process. My attitude is that the future of artefact fabrication will remain highly mechanised, and this is evident in the outcomes. I have not challenged this notion in my research. I have instead acknowledged the importance of hand skills and craft in designing for endurance, particularly as it relates to enchantment and effort, as this is established in existing theory. However, in my creative practice I have explored the potential of contemporary fabrication techniques to illicit similar effects resulting in enchantment and effort.

Reflection upon participant interaction

Although there were participants in all the design projects, I will focus on the final two projects, *En-case* and *For Now, For All-ways*, as these are documented and include formal user feedback.

Family ‘A’ Responses

Feedback for *En-case* was requested from Family A nine months after they acquired the furniture. The feedback was particularly positive. This may point to *participant bias*, that is, wanting to please the designer with positive responses about their design work and effort; for instance, they stated they were in “awe of the details and Penny’s time spent painstakingly building them...” (Family A respondents, 2017). However, it is interesting that the intensity of the detailing was noticed and *awe* was mentioned, as my research on enchantment and awe was never discussed with them.

Other responses proved more revealing; for example, in relation to living with the engravings in *En-case* over time:

[the *London* engraving] ...serv(es) a role to inspire us to perhaps return one day...it’s moved from a memory to possibly a causative agent for change in our current lives [and]... Most of the city patterns don’t recall a negative memory but instead cause a sense of FOMO [fear of missing out] when living in sleepy isolated Perth. (Family A respondents, 2017)

This indicates that over time, the artefact may accrue a negative feeling of loss, but at the moment it inspires a look to the past and to the future, and the design has created a conduit for generating aspirational life-goals. Changes in meaning over time can be

positive or negative and are difficult to anticipate.

Potential conflicting interpretations by family members also highlighted the importance of developing the framework criteria, 'Design for symbolic aging'. However, through design practice, the importance of considering the potential symbolic meaning became clear. In addition, superficial surface patterning clearly became of value for it can be removed or replaced over time if necessary.

For example, in discussing family heritage and meaningful events, the male from Family A (*En-case*) referenced his childhood connection to his paternal family through horseracing and gambling and found this early childhood interest informed his career through risk-taking, statistics and chance. He viewed his association with gambling and horse racing positively. His wife, however, upon seeing the developed pattern, wanted to exclude this reference as she "doesn't support horse racing in general" (pers. corresp., 15 May 2016).

Additionally, illustrations by the eldest daughter were incorporated into the surface treatment, however, their youngest son felt somewhat excluded as none of his illustrations were included (pers. corresp., May 2016). Thus, enabling a product to physically adapt to changing attitudes by adding or removing components became important in the design development of the furniture.

It is not surprising that the composite image mnemonic of various generations' childhoods, with the individuality of the daughter's large, joyful self-portrait (Figure 6-95) is a 'family favourite' (Family A respondents, 2017), and invests the effort of two generations with creativity.

In general, participant interaction can be time consuming, and there is no guarantee that the participants will ultimately feel connected to the surface patterning over time. Although some patterning was "absolutely loved" (Pers. Corresp., 2017) such as the Hong Kong patterning, there is no guarantee that enthusiasm will be passed onto others or remain over time. The symbolic meaning may change over time, as discussed in Section 5.15.2, which the male of Family A hints at:

Recently we have looked at this... and wondered why we like these juggernaut buildings so much — whereas in reality serving corporates inside them is not always as inspiring as the building[s]... themselves. Family A, Male respondent, 2017.

Family 'B' Responses

Feedback from Family 'B' highlights how meaning evolves through time and contemplation.

[Over time,] a new narrative is forming and I have begun to attach new meaning. For me the images are no longer individual parts of our lives as a family, but instead are about my son's, our baby[s]... short life and death. I know this is not what the work is about, but to me this is what the work has come to represent, the internal narrative of the work. Family B, Female respondent, 2017.

The surfaces again play a major role in communicating meaning and creating an emotional connection and investment of time as described by this participant's response:

The overlaid double exposed images of nature with shadows that both conceal and reveal are to me the most visually interesting. They closely track memories I already hold, which are already loaded with strong visual elements for me [particularly in] 'Beaches & Cave's, 'Ripples' and 'Hot Summer Walk' as well as 'Rainforest Tree Climbing'. The strongest and most emotive to me is 'Wanderings', which evokes deep feeling of sadness, and gentle forgiveness, healing and a letting go but conversely a holding on. Family B, Female respondent, 2017.

This feedback highlighted for me, the potential for the imagination coupled with fact and memory to create strong personal ties and the value created by encouraging the possessor to invest time and effort in making meaning. I discuss this further in my reflections upon surface below. The strong emotional connection and kinship-embedded self of the family members appears to have been achieved.

The process of working with participants in all projects, and most notably in these furniture projects, demonstrates how personal and intimate meaning can only be created through a consultative and participatory process. I sought to create a balance in this co-design process by ensuring that the participant made an emotional investment by revealing personal knowledge, yet the designed outcome is very much controlled by the designer. The possessor then is required to construct the narrative and invest time in contemplating the surfaces and resultant meaning.

Reflections on surface

I began to reflect on why the surface had become a crucial part of the creative process and outcomes, particularly as this was not part of my prior design practice. Art and design theorist Bruno was highly influential in his ideas of imaginings, narrative, and depth within surface, as well as the German theory of *Einführung*; meaning empathy (Bruno 2014). A material culture perspective was also highly influential, particularly Gregson and Crewe's observed phenomenon of *imagined history making* (2003,147).

Typically, contemporary furniture finishes are smooth and consistent, whether it is solid material or not, that they evoke a *coated* surface; if this is inconsistent, it is flawed in a negative sense, and incites disposal. Surface treatment such as engraving gives the solid material (or veneer in the case of *En-case*) a surface depth that is not otherwise accessible to the possessor and conceals surface damage. Engraving, with its varied depths, is visually and physically perceptible. This form of shallow carving gives the surface a new depth, beckoning the viewer to touch and engage with it, inviting interaction, which is crucial to the endurance of artefacts.

Throughout the creative process, the surface was often treated more as a textural than an applied or coloured finish. Carving (deep engravings), perforations and other cut-outs were adopted to evoke a greater sense of permanence and integration into the work. Surface is typically perceived as a thin film or layer (Bruno, 2014). However, creating 'depth' to the surface with layers, as in timber grain, the smooth surface between the deep cuts and intricate details implies layering that has formed over time.

Lighter engraving and printing was also explored as an opportunity to create surfaces that can be covered over when circumstances change. However, in contrast to a thin colour application, the printing and light engraving allow the original material to show through; thus, any fading or damage through use is better disguised and is less likely to be considered a flaw. Engraving, digital printing and cut-outs manipulate the artificially consistent smoothness typical of mass produced materials, and give depth through layering with the existing variance in material texture or grain.

Throughout the design process, and when comparing smooth surfaced components with the textured or printed, it was evident that the intricate or printed surfaces were more successful in evoking the ephemerality of memory, discovery, and notions of time and aging in many ways.

- i) The very fine and less dense treatment that resulted in a subtle pattern for the *For Now, For All-ways* project draws in the viewer, as engravings are more evident, depending on the angle of view and proximity. This subtle and changing surface dependent on the viewing angle gives a sense of the ephemeral.
- ii) The sheer, multiple overlays of imagery and black and white digital printing onto timber evokes the ephemerality of memory, the vulnerability of surface, and a sense of discovery, as evidenced by the possessor's feedback.
- iii) Communicative surfaces that tell enduring stories or reflect enduring values can create emotional connections and enable the user or viewer to spend time contemplating the meaning and purpose of the artefact over time. The ambiguity of imagery and text means it isn't obvious or revealing, but subtle, and acts more as pointers to navigate, and take time to understand and decode.
- iv) These surface treatments are each unique and create a rich variety of information to be contemplated. The surfaces communicate that this is no ordinary artefact, but something to be discovered, touched and cared for over time.

Memory is not always in focus, sharp or clear with defined boundaries; it is fractured, varied, partial, shifting in and out of focus. Thus, throughout the creative works, I explore embodied vestiges or traces of human memory. Like shadows or impressions cast onto the surface, the past experience leaves marks or scarification on the surface.

The surface evokes a sense of information to be understood, as some representations are camouflaged, ambiguous, or have a unique significance for the possessor. The object, in the hands of an uninformed possessor, would likely beckon to be understood, to reveal its past, akin to the 'recovery ritual'. The hidden meaning becomes the artefacts' power or agency over the possessor, engaging them to attempt to uncover its meaning or at least understand that it was once meaningful to a particular individual.

Like fleeting memories that suddenly surface in the mind, the surface aims to create a flowing in and out of the imagery, with no start or end, and hints at the past, enabling one to wander freely around the surface, along the lines, in a non-linear fashion. *Kaleidoscopic Wave*, in particular, creates ever-changing patterns and imagery that engage and remain

relevant to the viewer through the reflections.

While I commenced exploring surface through a relatively simple process of photography, graphics and wording, throughout the process I developed design skills in digital illustration to gain greater control as a designer. I also experimented with techniques and drawing styles to become more skilled in controlling the outcome and using the capacity of laser engraving in particular.

For Now, For All-ways marks the conclusion of a group of projects in which the surface is central to the evocation of heirloom status, in contrast to the predominant design approach, which claims long-lasting design must be stripped of decoration. Creating rich communicative surfaces allow people to 'sink into' and (re)discover or (re)engage with the additional layers of meaning.

Reflections on form

Contemporary design approaches can use methods in which consumers can experience furniture assembly in a more pleasurable way, or a way that allows for unique personal manifestations of the final object and develop narratives or person-object relations. This requirement for consumer assembly typically demands forms that are easy and self-evident, to avoid consumer frustration.

Form was explored in all the projects for semiotic and/or instrumental purposes. The designs evoke the forms of the Marri trees in *Marri Healing*, swelling waves in *Kaleidoscopic Wave*, spiritual characters in *From the Skies*, and quilted forms in *The Unforgotten* and *Endless Quilt*. However, developing empathic visual relations through form was not explored creatively. The principle of *design for empathic visual relations*, was conceived through textual research and intuition, but this opportunity was overshadowed by my new direction with surface exploration. Form was used most notably to help construct narrative in the community artefacts, or for its practical and instrumental opportunities and multi-stability in the *En-case* and *FNFA* projects.

The final domestic artefacts, *En-case* and *For Now, For All-ways*, focus on the importance of not being too prescriptive as a designer, and acknowledging that, among other things, objects need to be adaptable to unforeseen actions and uses. The forms also speak of the inherent difficulty in prescribing how an artefact is used in the future, while we are transitioning to an increasingly digital world.

While some enduring artefacts such as photographs become enduring and intergenerational for their unchanging quality, artefacts such as furniture can evolve with changing needs and wants, to remain enduring while still forming evidential links to the past.

Reflections on scale

The variety of project scales in terms of physical size and its relation to audience interaction and perception, not to mention gender, culture and age-related differences proved to be challenging and demanded hybrid design responses. The variety of scales proved fruitful, as I was able to explore differing notions of gaining audience attention and maintaining engagement, with visual changes due to viewing angles, or viewing through the artefact itself.

I explored large scale gestures in *Kaleidoscopic Wave*, viewing from a distance and at an intimate scale for the series *Marri-Kingia Past* and *From the Skies* (further to section 6.3, see also Appendix I showing scale). This exploration of the grand scale with the intimate enabled further layering of meaning, opportunities to explore ongoing audience engagement and (re)discovery as well as the power of tactile surfaces and physical touch with the furniture pieces. These creative outcomes demonstrated the way in which the Enduring Design Framework can be interpreted and applied. Through this process, the value of intimate surface detail within a design that is simultaneously bold and engaging from a distance generated a new practice direction and developed new skills.

Reflections on designing against psychological obsolescence

The aim of these projects is to delay disposal of still functioning built environment artefacts and surfaces by addressing psychological obsolescence. As raised on page 38, artefacts are often replaced due to the *replacement morality* phenomenon where the consumer justifies replacement for various reasons. While two of these reasons are perhaps outside the domain of the designer, that is the belief that the artefact has fulfilled its role for the price paid or that the owner deserves something 'new' as a reward, the other psychological rationales may be addressed.

One rationale for early disposal is the concern for emerging defects. In relation to the built environment, this may include issues such as a weakening structure or damage to surfaces. This has been addressed particularly in *FNFN* as the rope can easily be re-tensioned or single panels replaced if damaged. Minimal disposal is possible, as the

individually damaged units can be removed, while the remaining units still function independently and can be retained. Incidentally, the damaged units or individual panels may be replaced and satisfy the consumer's need for 'reward' without having to replace an entire ensemble.

Additionally, as with all the projects except *Kaleidoscopic Wave*, the surfaces have been designed to disguise damage to limit perception that defects exist. It is worth noting however that the surfaces of the *Kaleidoscopic Wave* are out of reach limiting incidental damage, and the viewing distance makes any defects would be difficult to detect. Furthermore, the use of one material, the longevity of stainless steel and the engineering design limits potential defects emerging in this work.

Perhaps the most challenging is the fact that some consumers justify that artefacts can be replaced due to the belief that it will be stored for future use or will be used by other consumers. While it is outside the domain of the designer to control consumer behaviour against disposal, my examination of designing for imagined historical reconstruction, seeks to address reappropriation as discussed in Chapters 5 and 6. If an artefact is disposed of, or handed down to others, the design solutions I trialled, aims to facilitates this reappropriation. My designs aim to enable the potential new owner, or a curator, to imagine a narrative meaningful to them, seek its provenance or for the custodial priming ritual to occur.

The design exploration has also sought to discover ways in which to avoid lifestyle obsolescence through forms that are adaptive to changing needs, lifestyle and spatial restrictions as seen in the *Endless Quilt*, *FNFA* and *En_case*. Perhaps most significant was my exploration into retaining objects as a social conduit to a loved one, a community or the kinship embedded self as part of an enduring identity.

CHAPTER 7 FINDINGS AND CONTRIBUTIONS

My research contributes to the discourse on sustainable consumption, ESD, and material culture, by examining and exploring ways to increase the emotional and psychological endurance of built environment artefacts. My findings emerge from understanding the cause of over-consumption and its inverse, custodianship, from a Design Anthropology approach to theory and practice. I extend upon theories by Fuad-Luke (2002; 2007; 2009; 2010) Thorpe (2007), Cooper (2010a; 2010b), Chapman (2005; 2009; 2010; 2014), Manzini (1995;2007; Manzini and Vezzoli 2002) and Walker (2011a; b; 2010; 2006b; 2014) through a proposed Enduring Design Framework, with contemporary and historical exemplars, and I propose additional approaches and creative outcomes.

7.1 THEORETICAL CONTRIBUTION

My theoretical findings and contributions evolved from action research, synthesising the literature review, surveys, interviews and design activity. My research expands upon the aforementioned contemporary ESD theorists of enduring design by incorporating more recent material culture and consumer behaviour findings, my new data, and design practice, to contribute new knowledge. New theoretical contributions are summarised below.

I identify a new way to interpret Maslow's theory of the Hierarchy of Needs in relation to product design. This re-interpretation prioritises people, the environment, and the person-object relationship, instead of using the theory to serve economic considerations such as building brand loyalty or increasing sales, as has occurred in the past. I link Maslow's theory to anthropological findings to reveal the needs that should be considered by designers in order to extend person-object relationships.

I reveal the 'custodial priming' and 'curatorial reframing' rituals not previously conceptualised as part of the reappropriation of goods. Design discourse focuses only on reappropriation in terms of instrumental function, or physical form as seen in the rituals of divestment and transformation. It rarely addresses the emotional and psychological process of reappropriation that is revealed through a Design Anthropology perspective. Through the exploration of the recovery, priming and reframing rituals, my Enduring

Design Framework has developed new principles that designers can consider to encourage (re)appropriation, the emotional and psychological intergenerational transfer of goods, for artefact endurance.

I explain the opportunity for addressing the evidential role of artefacts for an enduring person-object relationship based on building stronger attachment over time. I articulate principles that not only address the aesthetic, instrumental or semiotic artefact functions, but also the evidential function of artefacts. Verbeek's post-phenomenological theory articulates a way of considering the mediating role of artefacts as a by-product of direct experience. While this assists in unpacking the process of mediation, it falls short in revealing the additional phenomena which develop and evolve from repeated experience with the artefact over time. By designing artefacts that record, narrate, or encourage significant experiences, humans can perceive the artefact as containing evidence of the experience within the materiality, so that it becomes irreplaceable and worthy of being retained and maintained, and lives on.

I expand the strategies for extending the product-user relationship through the Enduring Design Framework in the following ways:

- I propose new categories; design for framed provenance, embodiment of higher needs, bodily accordance, and empathic visual relations;
- I expand the principles Chapman (2005) and others propose relating to materially aging with dignity. I incorporate symbolic aging, that solicits intergenerational meaning;
- I expand on Chapman's concept of enchantment by incorporating concepts from Gell (1998) and Bennett (2001, 2009);
- I expand on concepts of recycling and upcycling to consider the radical physical transformation of artefacts to create repurposed artefacts.

These contributions to the previously identified design strategies for extending product-user relationships are highlighted in colour in Figure 7-1 and are explained in further detail below.

- I describe the ability of a framed provenance to be expressed within an artefact to extend artefact longevity through practice examples and suggestions for designers. Gell (1998) and Miller's (2010) insight on object 'framing' through culture partly explains why particular objects are valued as heirlooms over others. The provenance of the artefact is perceived as a direct, material link, as evidence with its many associations, and reflects this to the possessor as if they too are endowed with

these qualities or semiotic meaning. Framed provenance has not been previously identified as a design opportunity for artefact endurance.

- I demonstrate how liveliness may be applied and encouraged to create empathy for an artefact of the built environment. Although design discourse has discussed this in part and in relation to electronic artefacts and material aging (Chapman 2005), I have shown how a liveliness through visual and relational anthropomorphism may build a person-object relationship with artefacts of the built environment. This liveliness increases the likelihood of a custodian-heirloom relationship.
- I propose and explain why framework principles such as design for kinship and self-relatedness, community connectedness, embodiment of virtues or spirituality, and symbolic aging generally, can create meaning across generations and thereby encourage enduring interpretation. Designs that express fashion, trends or newness are inherently temporary, and designs that focus purely on functionality and aesthetics are subject to volatile semiotic meaning and can easily fall from favour. However, artefacts that connect to higher enduring meanings can more easily be reappropriated, as the meaning remains connected and relevant to a wider community or generations.
- I propose and explore how built environment artefacts with empathic visual relations, bodily accordance, and enchantment can contribute to designing for emotional endurance. Artefacts that evoke qualities of uniqueness, rarity, embodiment of another person's effort and time, or customisation to one's self, with a high degree of pleasure, are considered heirlooms. Through theory, exemplars and creative production, I have demonstrated how these qualities can occur through the framework principles of designing for empathic visual relations, bodily accordance, and enchantment.

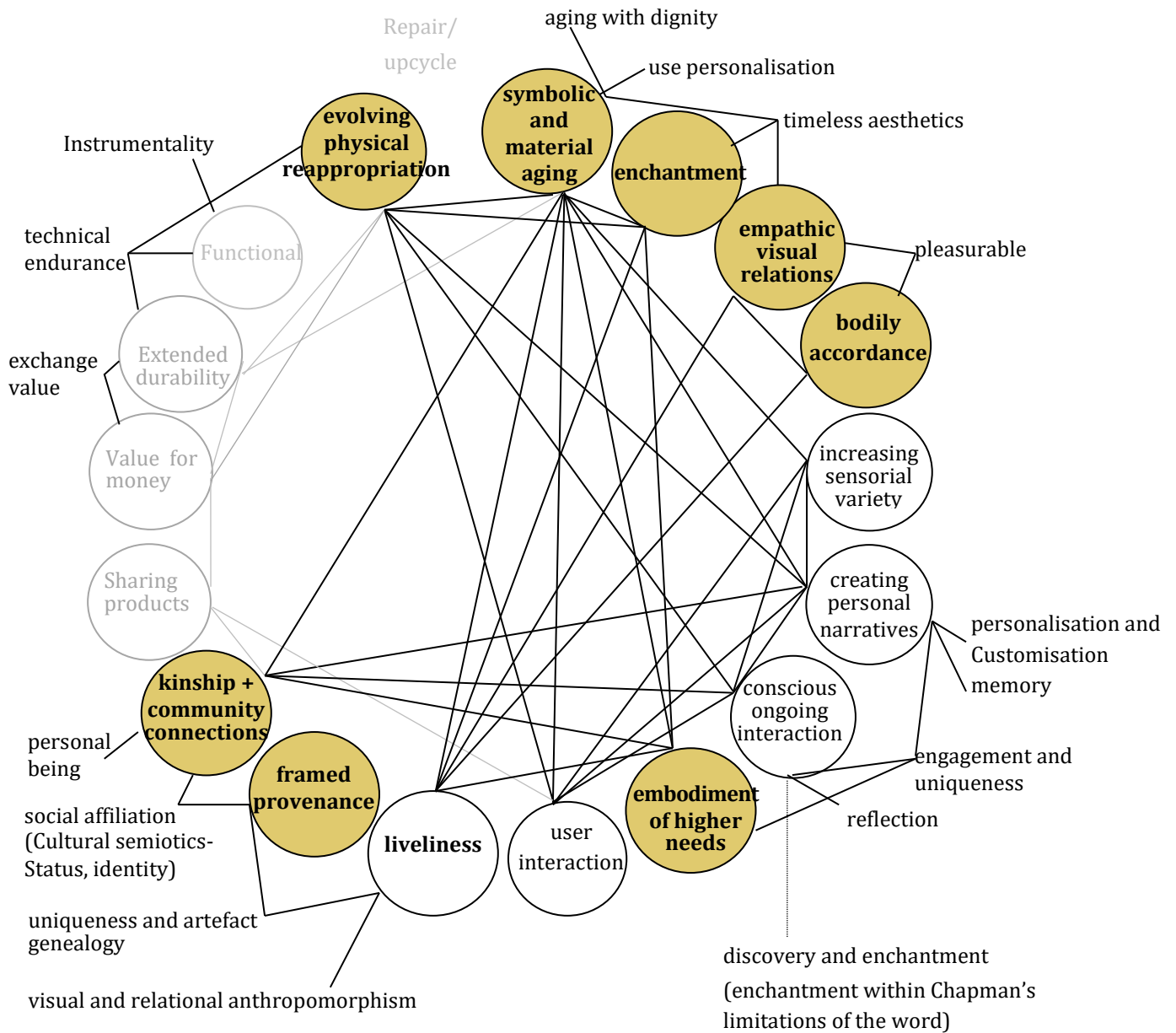


Figure 7-1. Refined and expanded chart of 'Strategies for Extending Product-user Relationships', 2017. Forlano 2017. Adapted from Fuad-Luke (2010, 617).

7.2 CREATIVE PRACTICE CONTRIBUTION

Contemporary designers typically design for immediate consumer needs, while design theorists in the field of enduring design have claimed designers have no control and therefore little to no responsibility for considering on-going consumer engagement, because of changing semiotic meaning and lifestyle, and psychological obsolescence.

My research indicates that designers can consider how artefacts act on the possessor or user beyond their instrumentality, aesthetic and symbolic role, through the by-product of experience over time; that is the artefact's narrative, genealogy and form bear evidence of human relations and experience accumulated over time. My original designs demonstrate ways to encourage long-term person-object relationship by acting as a relational other, to evoke empathy, liveliness and evidence of social relationships and relationships to place. Through the creative process I have achieved the following contributions to both my personal practice and the design industry generally.

My design practice explores the manifestation of the Enduring Design Framework, while also evolving the framework symbiotically. The creative process enhanced my material understanding, raised design opportunities, and interpreted and applied anthropological concepts.

I have expanded my practice by developing new skills in surface design. Surface design, a previously underexplored area of my own practice, has been explored and refined into a new approach to communicating with users through interviews and subsequent design of narrative-based surface patterning. In the development of surface and texture I explore the expression of marking, perforating, and creating translucency of multiple layers through both printing and engraving, to add and remove layers respectively. The surface appears as if it has been marked over time through memory.

Through creative practice, I have demonstrated that surface design is an important and underexplored consideration in contributing to enduring built environment artefacts, particularly furniture design. My intuitive exploration of surface for building artefact endurance was supported by the data collection and participant responses to the creative work. Through the survey analysis, it was revealed that a 'beautiful or interesting' surface was sought by 95% of the respondents. This raised the importance not only of surfaces that age well, as discussed in previous literature, but of the potential of designing unique surfaces as part of the design of built environment artefacts. While surface carving or texture was typical of handcrafted artefacts prior to the 20th century,

it is less evident in furniture particularly. Surface design offers the opportunity for built environment designers to consider enchantment and narrative through the surface as another opportunity for encouraging endurance.

Thinking beyond the initial purchase or initial user, designers can consider the ongoing engagement with experience over time. I demonstrate that designers can consider users in the creation of the work, and more importantly, ways to maintain ongoing engagement, encouraging attachment for future consumers, users or generations, challenging theorists such as Van Hinte's position, that emotional experience with artefacts is outside the domain of the designer. The methods proposed include stimulating discussion on meaning, narrative or provenance through visual prompts such as surface illustrations and patterns.

Through a series of propositional domestic artefacts and commissioned larger scale public works, I reveal how to materially manifest a multi-principled approach that can lead to an enrichment of the person-object relationship.

I have explored and materialised material culture notions of artefacts as lively and as extensions of the self in the design of new artefacts. Through the co-creation process of interview, reflection, decision making, and digital and physical building, the artefact becomes alive in the sense that the participant engages in its creation. Thus, it becomes part of the self, as described by Sartre (1943), Belk (1988) and Gell (1998). The created is not found and purchased with no history or story, but instead, its coming-into-being is understood and personal.

Novel outputs were created through their designed form, assembly methods, combination of technologies and conceptual outcomes. Evidence of the originality and value of the creative outcomes is: the inclusion of the work *Endless Quilt* for a peer-reviewed creative production as research exhibition; *The Unforgotten* featured in commercial galleries and was included in my article written for the 'A grade' journal, *Interstices*; *En-case's* design registration (Appendix D); and the open competitive tender commissions awarded for the community artefacts, *Kaleidoscopic Wave*, *From the skies* and the *Marri-Kingia Past* suite of works.

Design practitioners can use the Enduring Design Framework to further develop and reflexively critique their own practice. Practical design strategies are also provided to illustrate how the Enduring Design Framework may manifest (see Figure 5-6).

7.3 FUTURE RESEARCH

While I speculate on an enduring design framework and details on how this may manifest materially or through the design process, further research can test the success of these speculations. It is outside the scope of this project and time frame to examine a wide-ranging public interpretation of the entire creative body of work. This field of research would benefit from a future examination of the propositional and public artefacts created, through surveys and qualitative interviews over various set periods of time to test the emotional and social endurance of the works and changing attitudes, cultural shifts and generational reappropriation uptake.

This research would also be furthered by examining the way in which other designers may interpret the framework and offer alternative or additional principles and manifestations, and their impact upon consumer use and reappropriation over extended periods. The research could profitably examine each framework strategy separately in depth, through creative exploration, testing and reflection. Prioritising the constituent parts of the EDF would also be worthy of further research.

Karanika and Hogg found that narrative based possessions accrue greater meaning over time, and these possessions are more likely kept, even when they are no longer appropriate for one's life stage (2012, 4). However, although the artefact is kept, if it is not used it doesn't serve environmental concerns, as this doesn't reduce consumption by others. The modular approach may thus ease the modification of the artefact slowly over time. Conversely, it may make it easier to dispose of components; one can hold onto other parts of the possession for sentimental purposes but dispose of the rest. Thus, further research on design for separately functioning modules of a whole and its impact upon disposal and bequeathment patterns would be worthwhile.

The development of other ways to evoke empathic visual relations, and how this may relate to Design for Liveliness (visual and relational anthropomorphism) is an area not substantially explored in the creative process and is an area worthy of further research.

Co-design is an extensive area of emerging research. Finding the optimum level of co-creation from the user, forms of guidance from designers, and scope of opportunities for customisation by the online platform and/or manufacturer also warrants further research.

REFERENCES

- Acaroglu, Leyla. 2014. "Making Change: Explorations into Enacting a Disruptive Pro-sustainability Design Practice." PhD diss., School of Architecture and Design, RMIT.
- Ahuvia, Aaron C. 2005. "Beyond the Extended Self: Loved Objects and Consumers' Identity Narratives." *Journal of Consumer Research* 32 (1): 171-184. doi: 10.1086/429607.
- Amore, Carlotta Modica & Matteo Orland. *Variant of Vodo Masko*, 2016. Source: TOG. Accessed 14 March, 2017, <http://www.togallcreatorstogether.com/>
- Appadurai, Arjun (ed.). 1986. *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge: Cambridge University Press.
- Atakan, Sukriye Sinem. 2014. "Consumer Response to Product Construction: The Role of Haptic Stimulation." *International Journal of Consumer Studies* 38 (6): 586-592. doi: 10.1111/ijcs.12121.
- Attfield, Judith. 2000. *Wild Things: The Material Culture of Everyday Life*. Oxford: Berg Publishers.
- Bachelard, Gaston. 1994. *The Poetics of Space*. Edited and translated by Maria Jolas. Boston, Mass.: Beacon Press.
- Bakker, C A, Marcel den Hollander, Ed van Hinte, and Yvo Zijlstra. 2014. *Products that Last; Product Design for Circular Business Models*. Delft, NL: TU Delft Library/Marcel den Hollander IDRC.
- Bakker, Conny, Feng Wang, Jaco Huisman, and Marcel Den Hollander. 2014. "Products That Go Round: Exploring Product Life Extension through Design." *Journal of Cleaner Production* 69: 10-16. doi: 10.1016/j.jclepro.2014.01.028.
- Ball, Dwayne, and Lori Tasaki. 1992. "The Role and Measurement of Attachment in Consumer Behavior." *Journal of Consumer Psychology* 1 (2): 155-172.
- Barthes, Roland. c1972/1993. *Mythologies*. Edited and translated by Annette Lavers. London: Vintage.
- Baudrillard, Jean. 1968. *The System of Objects by Jean Baudrillard*. Translated by James Benedict. London: Verso.
- Belk, Russell. 1988. "Possessions and the Extended Self." *Journal of Consumer Research* 15 (2): 139-168.
- Belk, Russell. 1990. "The Role of Possessions in Constructing and Maintaining a Sense of Past." *Advances in Consumer Research*, edited by Marvin E Goldberg, Gerald Gorn and Richard W Pollay, 669-676. Provo, UT: Association for Consumer Research.
- Belk, Russell. 2004. "Are We What We Own?" In *I Shop, Therefore I Am, Compulsive Buying and the Search for the Self*, edited by April Lane Benson. Maryland: Rowman and Littlefield.
- Belk, Russell. 2006. "Collectors and Collecting." In *Handbook of Material Culture*, edited by Christopher Tilley, Webb Keane, Susanne Küchler, Rowlands Mike and Patricia Spyer, 534-545. London: Sage Publications.

- Belk, Russell. 2014. "You Are What You Can Access: Sharing and Collaborative Consumption Online." *Journal of Business Research* 67 (8): 1595.
- Belk, Russell W. 1985. "Materialism: Trait Aspects of Living in the Material World." *Journal of Consumer Research* 12 (3): 265-280.
- Belk, Russell W. 1995. *Collecting in a Consumer Society*. London: Routledge.
- Belk, Russell W. 1998. "The Double Nature of Collecting: Materialism and Anti-Materialism." *Etnofoor* 11 (1): 7-20.
- Belk, Russell W., and Kelly Tian. 2011. "Consumption and the Meaning of Life." In *Research in Consumer Behavior*, 249-274. Oxford, UK: Emerald Group Publishing.
- Belk, Russell, Melanie Wallendorf, and John F Sherry. 1989. "The Sacred and the Profane in Consumer Behavior: Theodicy on the Odyssey." *Journal of Consumer Research* 16 (1): 1-38.
- Belk, Russell W., and Guliz Ger. 2011. *Consumption in Affluent Societies*. Oxford: Eolss Publishers <http://www.eolss.net>.
- Benjamin, Walter. 1936. "Work of Art in the Age of Mechanical Reproduction." In *Art in Modern Culture- an Anthology of Critical Texts*, edited by F Frascina and J Harris, 297-307. London: Phiadon Press Limited.
- Bennett, Jane. 2001. *The Enchantment of Modern Life: Attachments, Crossings, and Ethics*. Princeton, N.J.: Princeton University Press.
- Bennett, Jane. 2009. *Vibrant Matter: A Political Ecology of Things*. North Carolina: Duke University Press.
- Bennett, Jane. 2010. "A Vitalist Stopover on the Way to a New Materialism." In *New Materialisms; Ontology, Agency, and Politics*, edited by Diana Coole and Samantha Frost, 47-69. Durham: Duke University Press.
- Bishop, Claire. 2012. *Artificial Hells: Participatory Art and the Politics of Spectatorship*. 1st ed. Brooklyn, NY: Verso Books.
- Blevis, Eli. 2007. "Sustainable Interaction Design: Invention & Disposal, Renewal & Reuse." In *Proceedings of the 25th Annual SIGCHI Conference on Human Factors in Computing Systems, New York, April 28-May 03 2007*, 503-512.
- Borgmann, Albert. 1995. "The Depth of Design." In *Discovering Design; Exploration in Design Studies*, edited by Richard Buchanan and Victor Margolin, 13-22. Chicago: The University of Chicago Press.
- Botton, Alain de. 2004. *Status Anxiety*. London: Hamish Hamilton/Penguin Books.
- Bourdieu, Pierre. 1984. *Distinction: A Social Critique of the Judgement of Taste*. Translated by Richard Nice. London: Routledge.
- Broached Commissions. 2015. "Broached Commissions — Private Commissions." Accessed 12 July 2015. http://broachedcommissions.com/private_commissions.html.
- Bruno, Giuliana. 2002. *Atlas of Emotion; Journeys in Art, Architecture and Film*. New York: Verso.

- Bruno, Giuliana 2014. *Surface: Matters of Aesthetics, Materiality, and Media*. Chicago: The University of Chicago Press.
- Bruno, Isabelle, and Christine Baillet. 2016. *Reinventing IKEA: 70 DIY Projects to Transform IKEA Essentials*. New York: Abrams.
- Bullard, Robert D. 2000. *Dumping in Dixie: Race, Class, and Environmental Quality*. 3rd. ed. Boulder, Colorado: Westview Press.
- Bush, Donald. 1989. "Body Icons and Product Semantics." In *Proceedings from the Symposium on Design Research and Semantics*. University of Industrial Arts Helsinki, 17-18 May 1989, C1-14.
- Campbell, Colin. 1987. *The Romantic Ethic and the Spirit of Modern Consumerism*. Oxford, UK: Basil Blackwell Inc.
- Chandler, Jesse , and Norbert Schwarz. 2010. "Use Does Not Wear Ragged the Fabric of Friendship: Thinking of Objects as Alive Makes People Less Willing to Replace Them." *Journal of Consumer Psychology* 20: 138-145. doi:10.1016/j.jcps.2009.12.008.
- Chapman, Jonathan. 2005. *Emotionally Durable Design. Objects, Experiences, and Empathy*. London, Sterling, VA : Earthscan.
- Chapman, Jonathan. 2009. "Design for (Emotional) Durability." *Design Issues* 25 (4): 29-35.
- Chapman, Jonathan. 2010. "Subject/Object Relationships and Emotionally Durable Design." In *Longer Lasting Products: Alternatives to the Throwaway Society*, ed Tim Cooper, 61-76. Surrey, England: Gower Publishing Ltd.
- Chapman, Jonathan. 2014. "Designing Meaningful and Lasting User Experiences." In *Love Objects: Emotion, Design and Material Culture*, edited by Anna Moran and Sorcha O'Brien, 137-148. New York: Bloomsbury Publishing.
- Chapman, Jonathan, ed. 2017. *Routledge Handbook of Sustainable Product Design*. Oxon, U.K.: Routledge.
- Chapman, Jonathan, and Nick Gant. 2007. "Chapter 1: Introduction." In *Designers, Visionaries and Other Stories: A Collection of Sustainable Design Essays*, edited by Jonathan Chapman and Nick Gant, 1-14. London: Sterling, Va.: Earthscan.
- Cherrier, H el ene. 2010. "Custodian Behavior: A Material Expression of Anti-consumerism." *Consumption Markets & Culture* 13 (3): 259-272. doi: 10.1080/10253861003786983.
- Cherrier, Helene, Iain R. Black, and Mike Lee. 2011. "Intentional Non-consumption for Sustainability: Consumer Resistance and/or Anti-consumption?" *European Journal of Marketing* 45 (11/12): 1757-1767. doi:10.1108/03090561111167397.
- Cherrier, H el ene, and Tresa Ponnor. 2010. "A Study of Hoarding Behaviour and Attachment to Material Possessions." *Qualitative Market Research: An International Journal* 13 (1): 8-23.
- Cherrier, Helene, Meltem T ure, and Nil  z a lar-Toulouse. 2014. "Considering the Human Properties of the Non-Humans: An Analysis of Pragmatogony in Dispossession Stories." In *Consumer Culture Theory*, edited by John W. Schouten, Diane M. Martin and Belk. Russell, 99-114. Bingley, U.K: Emerald Group Publishing.
- Chicago Home + Garden. Magazine cover, Summer 2012. Source: Home and Garden. Accessed 5 November, 2016, <http://www.chicagomag.com/>

- Chick, Anne, and Paul Micklethwaite. 2011. *Design for Sustainable Change: How Design and Designers Can Drive the Sustainability Agenda*. Lausanne, Switzerland: AVA Publishing.
- Claxton, Guy. 2000. "The Anatomy of Intuition." In *The Intuitive Practitioner: On the Value of Not Always Knowing What One Is Doing*, edited by Terry Atkinson and Guy Claxton, 32-52. Buckingham (England): Open University Press.
- Cohen, Deborah. 2006. *Household Gods: the British and their Possessions* New Haven: Yale University Press.
- Conrads, Ulrich, ed. 1989. *Programs and Manifestoes on 20th-century Architecture*. Cambridge, Massachusetts: MIT Press.
- Cooper, Karyn, and Robert E White. 2012. *Qualitative Research in the Post-Modern Era: Contexts of Qualitative Research*. Springer. <https://sites.duke.edu/niou/files/2014/06/cooper11book.pdf>
- Cooper, Tim. 2004. "Inadequate Life? Evidence of Consumer Attitudes to Product Obsolescence." *Journal of Consumer Policy* 27 (4): 421-449. doi: 10.1007/s10603-004-2284-6.
- Cooper, Tim, ed. 2010a. *Longer Lasting Products; Alternatives to the Throwaway Society*. Surrey, England: Gower Publishing. <http://curtin.ebib.com.au/patron/FullRecord.aspx?p=581327>.
- Cooper, Tim. 2010b. "The Significance of Product Longevity." In *Longer Lasting Products : Alternatives To The Throwaway Society*, edited by Tim Cooper, 3-36. Surrey, England: Gower Publishing.
- Coulter-Smith, Graham. 2006. *Deconstructing Installation Art*. Southampton, U.K.: Casiad Publishing.
- Crilly, Nathan, James Moultrie, and P. John Clarkson. 2004. "Seeing Things: Consumer Response to the Visual Domain in Product Design." *Design Studies* 25 (6): 547-577. doi: 10.1016/j.destud.2004.03.001.
- Crocker, Robert. 2012. "Transforming Consumerism by Design: Reconsidering Sustainability and Behaviour Change." *AGIDEAS Research: Design for Business* 1. http://search.ror.unisa.edu.au/record/UNISA_ALMA11142964910001831/media/digital/open/9915914151801831/12142964900001831/13142963200001831/pdf
- Crocker, Robert 2016. *Somebody Else's Problem: Consumerism, Sustainability & Design*. Sheffield, UK: Greenleaf Publishing Limited.
- Cross, Nigel. 1982. "Designerly Ways of Knowing." *Design Studies* 3 (4): 221-227. doi: 10.1016/0142-694X(82)90040-0.
- Csikszentmihalyi, Mihaly 2014. *Flow and the Foundations of Positive Psychology: The Collected Works of Mihaly Csikszentmihalyi*. Netherlands: Springer.
- Csikszentmihalyi, Mihaly, and Eugene Rochberg-Halton. 1981. *The Meaning of Things: Domestic Symbols and Self*. Cambridge: Cambridge University Press.
- Curasi, Carolyn Folkman, Linda Price, and Eric J. Arnould. 2004. "How Individuals' Cherished Possessions Become Families' Inalienable Wealth." *Journal of Consumer Research* 31 (3): 609-622.

- Curtis, Robin, and Richard George Elliott. 2014. "An Introduction to *Einführung*." *Art in Translation* 6 (4): 353-376. doi: 10.1080/17561310.2014.11425535.
- Daniels, Michael. 1982. "The Development of the Concept of Self-actualization in the Writings of Abraham Maslow." *Current Psychological Reviews* 2 (1):61-75
- Datschefski, Edwin. 2001. *The Total Beauty of Sustainable Products*. Crans-Pres-Celigny, Switzerland: RotoVision.
- Davison, Sandra, Kirrilly Thompson, Anne Sharp, and Drew Dawson. 2013. "Reducing Wasteful Household Behaviours: Contributions from Psychology and Implications for Intervention Design." In *Designing for Zero Waste: Consumption, Technologies and the Built Environment*, edited by Steffen Lehmann and Robert Crocker, 67-88. Florence, USA: Taylor and Francis.
- Defazio, Kimberly. 2004. "IKEA and Democracy as Furniture." *Nature, Society, and Thought* 17 (2): 143.
- Department of Astronomy, University of Wisconsin-Madison. Constellation of Orion, n.d Source: University of Wisconsin- Madison. Accessed 08 November 2017, www.astro.wisc.edu
- Department of the Environment., ed. 2017. "Approved Conservation Advice for *Corymbia calophylla* - *Kingia australis* woodlands on heavy soils of the Swan Coastal Plain." Environmental Protection and Biodiversity Conservation Act. [[url/pdf?](#)]
- Devinney, Timothy, Patrice Auger, Giana Eckhardt, and Thomas Birtchnell. 2006. "The Other CSR: Making Consumers Socially Responsible." *Stanford Social Innovation Review*, Fall: 30-37.
- Devinney, Timothy M, Pat Auger, and Giana M Eckhardt. 2010. *The Myth of the Ethical Consumer*. Cambridge, UK.: Cambridge University Press.
- DiCicco-Bloom, Barabara and Benjamin F. Crabtree. 2006. "The Qualitative Research Interview." *Medical Education* 40: 314-321. doi:10.1111/j.1365-2929.2006.02418.x
- Dillon, Patrick, and Tony Howe. 2003. "Design as Narrative: Objects, Stories and Negotiated Meaning." *International Journal of Art & Design Education* 22 (3): 289-296. doi: 10.1111/1468-5949.00366.
- Dittmar, Helga. 1991. "Meanings of Material Possessions as Reflections of Identity: Gender and Social-Material Position in Society." *Journal of Social Behavior & Personality*, 6(6): 165-186.
- Douglas, Mary, and Baron Isherwood. 1979/2002. *The World of Goods: Towards an Anthropology of Consumption*. London: Routledge.
http://samples.sainsburysebooks.co.uk/9781134791675_sample_512953.pdf.
- Dutton, Denis. 2009. *The Art Instinct: Beauty, Pleasure, & Human Evolution*. New York: Bloomsbury Press.
- Duxbury, Lesley, Elizabeth M Grierson, and Dianne Waite. 2008. *Thinking Through Practice: Art as Research in the Academy*. Melbourne, Vic.: RMIT Publishing.
- E-BISCUS. 2016. "TOG: All Creators Together." OVH, accessed 23 November, 2016.
<http://www.togallcreatorstogether.com/whats-tog-2/>.
- Eckhardt, Giana M, Russell Belk, and Timothy M Devinney. 2010. "Why Don't Consumers Consume Ethically?" *Journal of Consumer Behaviour* 9 (6): 426-436. doi: 10.1002/cb.332.

- Egly-Thompson, Karen. 2013. "Patricia Urquiola: Design Tour de Force." Houzz. <http://designsalad.info/2013/05/06/patricia-urquiola-design-tour-de-force/>.
- Elle Décor (UK). Magazine cover, June 2009. Source: Elle Décor. Accessed 5 November, 2016, <http://www.aphrochic.com/2009/06/01/elle-decor-summer-chic/comment-page-1/>
- Elliott, Richard 1997. "Existential Consumption and Irrational Desire." *European Journal of Marketing* 31 (3/4): 285-297.
- EPA. 2015 (June). "Advancing Sustainable Materials Management: Facts and Figures 2013." Edited by Office of Resource Conservation and Recovery. United States Environmental Protection Agency. <https://www.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures>
- Epp, Amber, and Linda Price. 2008. "Family Identity: A Framework of Identity Interplay in Consumption Practices." *Journal of Consumer Research* 35 (1): 50-70. doi: 10.1086/529535.
- Epp, Amber, and Linda Price. 2010. "The Storied Life of Singularized Objects: Forces of Agency and Network Transformation." *Journal of Consumer Research* 36 (5): 820-837. doi: 10.1086/603547.
- Fabbed Limited. 2016. "Open Desk." accessed 13 December <https://www.opendesk.cc/>.
- Faerna, Maruja Rodriguez. Handwritten transcribed poetry (portion). c1949 (scanned image 2013).
- Feill, Charlotte, and Peter Fiell. 1991. *Modern Furniture Classics Since 1945*. Washington: The American Institute of Architects Press/Thames and Hudson.
- Fiell, Charlotte and Peter Fiell, eds. 2003. *Design for the 21st Century*. Köln, Germany: Taschen.
- Ferraro, Rosellina, Jennifer Escalas, and James Bettman. 2010. "Our Possessions, Our Selves: Domains of Self-worth and the Possession-self Link." *Journal of Consumer Psychology* 21(2): 169-177. doi: 10.1016/j.jcps.2010.08.007.
- Filson, Anne, and Gary Rohrbacher. 2016. "AtFAB." Accessed 13 December 2016. <http://atfab.co/about/>.
- Forlano, Penelope. 2016. "From the Skies- Public Art." Accessed 05 January 2016. <http://forlanodesign.com/public-art.html>
- Forlano, Penelope. 2015. "Making Custodians; Furniture as Intergenerational Objects." In *Conference Proceedings Unmaking Waste 2015; Transforming Production and Consumption in Time and Place, Adelaide, Australia, 22-24 May, 2015, 152-165*. http://unmakingwaste2015.org/wp-content/uploads/2015/09/UMW_Cover_Foreword_Table-of-Contents-.pdf
- Forlano, Penelope 2012. Endless Quilt: Object Range. In *An Interior Affair: A State of Becoming (Book 2: Exhibition Catalogue) IDEA (Interior Design/Interior Architecture Educators Association)* edited by Marina Lommerse, J Lawrence, S Mehzoud, and S Foster, [page range]. Perth, WA: FORM Contemporary Craft and Design.
- Forlano, Penelope, and Dianne Smith. 2012. "Becoming Object, Other or Self Through Designing and Making." *Interior: A State of Becoming: IDEA (Interior Design/Interior Architecture Educators Association)*. Perth: Symposium Proceedings.

Fournier, Susan. 1991. "Meaning-based Framework for the Study of Consumer-Object Relations." In *Advances in Consumer Research*, edited by Rebecca Holman and Michael Solomon, 736-742. Provo UT: Association for Consumer Research.

Fournier, Susan, and David Glen Mick. 1999. "Rediscovering Satisfaction." *Journal of Marketing* 63: 5-23.

Franke, Nikolaus, and Martin Schreier. 2010. "Why Customers Value Self-Designed Products: The Importance of Process Effort and Enjoyment." *Journal of Product Innovation Management* 27: 1020-1031.

Franke, Nikolaus, Martin Schreier, and Ulrike Kaiser. 2010. "The 'I Designed It Myself' Effect in Mass Customization." *Management Science* 56 (1): 125-140. doi: 10.1287/mnsc.1090.1077.

Fromm, Erich. 1976. *To Have or To Be?* New York: Bantam Books.

Front Design. *Awakening Lamp*, 2003. Source: Front Design. Accessed 1 November, 2017, <http://www.frontdesign.se/lighting-projects>

Fry, Tony. 2011. *Design as Politics*. New York: Berg.

Fuad-Luke, Alastair. 2002. *The Eco-design Handbook: a Complete Sourcebook for the Home and Office*. London: Thames & Hudson.

Fuad-Luke, Alastair. 2007. "Re-defining the Purpose of (Sustainable) Design: Enter the Design Enablers, Catalysts in Co-design." In *Designers, Visionaires and Other Stories: A Collection of Sustainable Design Essays*, edited by J Chapman and Nick Gant, 18-52. London: Earthscan.

Fuad-Luke, Alastair. 2009. *Design Activism: Beautiful Strangeness for a Sustainable World*. Oxon, UK: Taylor & Francis.

Fuad-Luke, Alastair. 2010. "Adjusting our Metabolism; Slowness and Nourishing Rituals of Delay in Anticipation of a Post-Consumer Age." In *Longer Lasting Products; Alternatives to the Throwaway Society*, edited by Tim Cooper, 133-156. Surrey, England: Gower Publishing.

Galvin, Ray. 2015. "How many interviews are enough? Do qualitative interviews in building energy consumption research produce reliable knowledge?" *Journal of Building Engineering* 1: 2-12. doi:10.1016/j.jobe.2014.12.001

Gamper, Martino. *100 chairs in 100 days project*, 2007. Source: Martino Gamper. Accessed 14 March, 2017. <http://martinogamper.com/project/a-100-chairs-in-a-100-days/>

Garvey, Pauline. 2013. "'Ikea Sofas Are Like H&M Trousers': The Potential of Sensuous Signs." *Journal of Business Anthropology* 2(1): 75-92. doi: 10.22439/jba.v2i1.4072

Gatt, Caroline, and Tim Ingold. 2013. "From Description to Correspondence: Anthropology in Real Time." In *Design Anthropology: Theory and Practice*, edited by Wendy Gunn, Ton Otto and Rachel Charlotte Smith, 139-158. London: Bloomsbury.

Gell, Alfred. 1992. "The Technology of Enchantment and the Enchantment of Technology." In *Anthropology, Art, and Aesthetics*, edited by J Coote and A Shelton, 40-65. Oxford: Oxford University Press.

Gell, Alfred. 1998. *Art and Agency: Towards a New Anthropological Theory*. Oxford: Clarendon Press.

Genus, Audley. 2016. *Sustainable Consumption: Design, Innovation and Practice*. Surrey, U.K.: Springer.

Given, Lisa M. 2008. "Action Research " In *The SAGE Encyclopedia of Qualitative Research Methods*. Thousand Oaks; California: SAGE Publications. Accessed November 23, 2013. doi: 10.4135/9781412963909

Glenn, Joshua, and Rob Walker, eds. 2012. *Significant Objects* Seattle, WA: Fantagraphics Books.

Goffman, Erving. 1969. *The Presentation of Self in Everyday Life*. London: Allen Lane.

Goffman, Erving. 1974. *Frame Analysis: an Essay on the Organization of Experience*. Cambridge, Mass.: Harvard University Press.

Goodrum, Adam. *Piano Credenza*, 2014. Source: Broached Commissions. Accessed: 14 March, 2017, <http://broachedcommissions.com/piano>

Graeber, David. 2001. *Toward An Anthropological Theory of Value: The False Coin of Our Own Dreams*. Basingstoke, UK.: Palgrave Macmillan.

Gray, Carole, and Julian Malins. 2004. *Visualizing Research: A Guide to the Research Process in Art and Design*. Burlington: Ashgate.

Grayson, Kent , and Donald Shulman. 2000. "Indexicality and the Verification Function of Irreplaceable Possessions: A Semiotic Analysis." *Journal of Consumer Research* 27 (1): 17-30.

Greenbaum, Joan, and Daria Loi. 2012. "Participation, the Camel and the Elephant of Design: An Introduction." *CoDesign* 8 (2-3): 81-85. doi: 10.1080/15710882.2012.690232.

Greenhalgh, Paul. 1990. "Introduction" In *Modernism in Design*, edited by Peter Greenhalgh, 1-25. London: Reaktion Books

Gregson, Nicky and Lousie Crewe. 2003. *Second-hand Cultures*. Oxford: Berg.

Grosse-Hering, Barbara. 2014. *Slow Design; Book of Inspiration*. Accessed 15 June 2015. http://studiolab.ide.tudelft.nl/diopd/wp-content/uploads/2014/12/Book_of_Inspiration_SlowDesign.pdf

Gunn, Wendy, Ton Otto and Rachel Charlotte Smith, 2013. "Preface" In *Design Anthropology: Theory and Practice*, edited by Wendy Gunn, Ton Otto and Rachel Charlotte Smith, xiii-xiv. London: Bloomsbury.

Hamilton, Clive and Richard Denniss. 2005. *Affluenza: When Too Much is Never Enough*. Crows Nest, Australia: Allen & Unwin.

Hampson, Misses. *The Westbury Quilt* (detail) c. 1900-1903. Fabric quilt. National Gallery of Victoria, Melbourne.

Hankammer, Stephan, Maike Hora, Luca Canetta, and Sultan Kaygin Sel. 2016. "User-Interface Design for Individualization Services to Enhance Sustainable Consumption and Production." *Procedia CIRP* 47: 448-453. doi: 10.1016/j.procir.2016.03.077.

Hanley, Steven J and Steven C. Abell 2002. "Maslow and Relatedness: Creating an Interpersonal Model of Self-Actualization," *Journal of Humanistic Psychology* 42(4): 37-57. doi 10.1177/002216702237123

Hawken, Paul, Amory Lovins, and L. Hunter Lovins. 1999. *Natural Capitalism: Creating the Next Industrial Revolution*. 1st ed. Boston: Little, Brown and Co.

Haws, Kelly L., Rebecca Walker Naylor, Robin A. Coulter, and William O. Bearden. 2012. "Keeping it all without being buried alive: Understanding product retention tendency." *Journal of Consumer Psychology* 22 (2): 224-236. doi: 10.1016/j.jcps.2011.05.003.

Hebrok, Marie. 2010. "Developing a Framework of Dis-domestication: The Dis-domestication of Furniture in Norwegian Households." Master Thesis. Centre for Technology, Innovation and Culture, University of Oslo.

Hebrok, Marie. 2014. "Design for Longevity: Taking Both the Material and Social Aspects of Product-life into Account." *Journal of Design Research* 12 (3): 204-220.

Hein Eek, Piet. *Waste Waste 40 x 40 chair*, 2014. Source: Piet Hein Eek.

Heijdens, Simon. *Broken White*, 2004. Source: Simon Heijdens. Accessed: 14 March, 2017, www.simonheijdens.com

Heisley, Deborah D. and Deborah Cours. 2007. "Connectedness and Worthiness for the Embedded Self: A Material Culture Perspective." *Consumption, Markets & Culture* 10 (4): 425-450.

Hemetsberger, Andrea. 2014. "There's No Passion, I Need Passion: Why Some Brands Excite Consumers So Much." *GfK Marketing Intelligence Review* 6 (1): 34-39.

Historic Houses Trust. n. d. "Collections." Accessed 02 February 2016. <http://museum.collection.hht.net.au/search.do?id=997&db=object&page=1&view=detail>.

Holman, Will. 2015. *Guerilla Furniture Design: How to Build Lean, Modern Furniture with Salvaged Materials*. North Adams: MA Storey Publishing.

Mahr, Horst. (n.d). Detail of Marri tree bark and kino (photograph). Source: Getty Images. Accessed 29 January, 2016, <http://www.gettyimages.com.au/detail/photo/resin-produced-by-a-carbonized-red-gum-or-marri-royalty-free-image/130875743>

Hoskins, Janet. 2006. "Agency, Biography and Objects." In *Handbook of Material Culture*, edited by Christopher Tilley, Webb Keane, Susanne K lcher, Michael Rowlands and Patricia Spyer, 74-84. London: SAGE Publications.

Hotel-Hotel. 2016. The Ownership of Things. In *Fix and Make PANEL*: SoundCloud. Accessed 12 December 2016. <https://www.hotel-hotel.com.au/fixandmake/events/the-ownership-of-things/>

Huffman, Cynthia, and Barbara E. Kahn. 1998. "Variety for Sale: Mass Customization or Mass Confusion?" *Journal of Retailing* 74 (4): 491-513. doi: [https://doi.org/10.1016/S0022-4359\(99\)80105-5](https://doi.org/10.1016/S0022-4359(99)80105-5).

Ingold, Tim. 2011. *Being Alive: Essays on Movement, Knowledge and Description*. London: Routledge.

Inside Out - Australia. Magazine cover, n.d. Source: Inside Out. Accessed 5 November, 2016, <http://www.insideout.com.au>

Investwood SA, n.d. *Valchromat; A Forest of Colour*. Accessed 23 February 2017. <http://www.valchromat.pt/content.aspx?menuid=347>

- Jackson, Tim. 2010. "Foreword" In *Longer Lasting Products; Alternatives to the Throwaway Society*, ed Tim Cooper, xv-xvii. Surrey, England: Gower Publishing Ltd.
- Jansen, Trent. *Chinaman's Chair*, 2004. Source: Trent Jansen. Photography by Scotty Cameron. Accessed: 27 November, 2015, http://broachedcommissions.com/commissions/2013/east/chinamans_file_rocking_chair/index.html
- Jelsma, Jaap. 2006. "Designing 'Moralized' Products." In *User Behavior and Technology Development: Shaping Sustainable Relations Between Consumers and Technology*, edited by Peter-Paul Verbeek and Adriaan Slob, 221-231. Dordrecht, Netherlands: Springer.
- Jelsma, Jaap, and Marjolijn Knot. 2002. "Designing Environmentally Efficient Services; A 'Script' Approach." *The Journal of Sustainable Product Design* 2 (3):119-130. doi: 10.1023/B:JSPD.0000031031.20974.1b.
- Jordan, Patrick W. 2003. *Designing Pleasurable Products: An Introduction to the New Human Factors*. Hoboken: Taylor and Francis.
- Jung, Heekyoung, Shaowen Bardzell, Eli Blevis, James Pierce, and Erik Stolterman. 2011. "How Deep Is Your Love: Deep Narratives of Ensoulment and Heirloom Status." *International Journal of Design* 5 (1): 59-71.
- Karanika, Katerina, and Margaret K. Hogg. 2012. "Trajectories Across the Lifespan of Possession-self Relationships." *Journal of Business Research*. doi: 0.1016/j.jbusres.2011.12.010.
- Karwowski, Waldemar, Marcelo M Soares and Neville A Stanton (ed). 2011. *Human Factors and Ergonomics in Consumer Product Design: Uses and Applications*. Hoboken: Taylor and Francis.
- Kasser, Tim. 2003. *The High Price of Materialism*. Cambridge: MIT Press
- Keane, Webb. 2003. "Semiotics and the Social Analysis of Material Things." *Language & Communication* 23 (3-4): 409-425. doi: 10.1016/s0271-5309(03)00010-7.
- Keulemans, Guy. 2015. "Affect; the Experimental Design of Domestic Products." PhD Diss, Faculty of Art and Design, The University of New South Wales.
- Keulemans, Guy. n.d. "Archaeologic." Accessed 15 July, 2017. <http://guykeulemans.com/stuff/archaeologic>.
- Kilbourn, Kyle 2013. "Tools and Movements of Engagement: Design Anthropology as a Particular Style of Knowing." In *Design Anthropology: Theory and Practice*, edited by Wendy Gunn, Ton Otto and Rachel Charlotte Smith, 68-82. London: Bloomsbury.
- Kinjo, Keita and Takeshi Ebina. 2015. "Paradox of Choice and Consumer Nonpurchase Behavior" *Art and Society*, 30 (2): 291-297. doi: 10.1007/s00146-014-0546-7
- Kleine, Susan S and Stacey Menzel Baker. 2004. "An Integrative Review of Material Possession Attachment." *Academy of Marketing Science Review* 8 (5): 1-35.
- Kleine, Susan Schultz, Robert E. Kleine III, and Chris T. Allen. 1995. "How is a Possession 'Me' or 'Not Me'? Characterizing Types and an Antecedent of Material Possession Attachment." *Journal of Consumer Research* 22 (3): 327-343. doi: 10.2307/2489618.
- Knez, Igor. 2005. "Attachment and identity as related to a place and its perceived climate." *Journal of Environmental Psychology* 25 (2): 207-218. doi: 10.1016/j.jenvp.2005.03.003.

- Koestembaum, Wayne. *Object 10. Duck Nutcracker description and commencement of imagined narrative*, 2009. Source: Significant Objects, posted 14 December, 2009. Accessed 14 March, 2017, <http://significantobjects.com/2009/12/14/duck-nutcracker/>
- Kopytoff, Igor, ed. 1986. *The Cultural Biography of Things: Commoditization as Process*. In *The Social Life of Things*, edited by Arjun Appadurai, 65–91. Cambridge: Cambridge University Press.
- Koren, Leonard. 1994. *Wabi-Sabi for Artists, Designers, Poets & Philosophers*. Berkeley, California: Stone Bridge Press.
- Koskela. *Yolngu weavers*, n.d. Source: Koskela, posted 11 June 2015. Accessed 14 March, 2017. <https://www.instagram.com/koskela>
- Koskela. *Yolngu weaver*, Photograph. Source: Koskela, posted 10 June 2015. Accessed 14 March, 2017. <https://www.instagram.com/koskela>
- Koskela and Yolngu weavers. *Yuta Badayala lamp shade*, 2015. Source: Koskela, posted 11 August 2015. Accessed 14 March, 2017, <https://www.instagram.com/koskela>
- Koskela. *Koskela staff and Yolngu weaver* n.d. Source: Koskela, posted 18 June 2015. Accessed 14 March, 2017. <https://www.instagram.com/koskela>
- Kotler, Philip. 1986. "The Prosumer Movement: a New Challenge for Marketers." *Advances in Consumer Research* 13: 510-513. Accessed: August 13, 2016. acrwebsite.org/volumes/6542/volumes/v13/NA-13
- Krippendorff, Klaus. 2004. *The Semantic Turn: A New Foundation for Design*. Hoboken: Taylor and Francis.
- Krippendorff, Klaus, and Reinhardt Butter. 1984. "Product Semantics: Exploring the Symbolic Qualities of Form." *The Journal of the Industrial Designers Society of America* 2 (3): [page range].
- Kwint, Marius 1999. "Introduction: The Physical Past." In *Material Memories: Design and Evocation*, edited by Marius Kwint, Christopher Breward and Jeremy Aynsely, [page range]. Oxford: Berg.
- Larkin, E, and T Bergin. 2013. *Desktop Aboriginal Heritage Review for the Proposed Airport Rail Link*. Accessed 10 December 2014. http://www.epa.wa.gov.au/sites/default/files/Referral_Documentation/CMS14380%20EIA%20document%20%20Appendix%209101112%20%20Aboriginal%20heritage%20and%20Archaeology.pdf
- Lastovicka, John L, and Nancy J Sirianni. 2013. "Beloved Material Possessions." In *The Routledge Companion to Identity and Consumption*, edited by Ayalla A. Ruvio and Russell Belk, [page range]. London: Taylor & Francis.
- Latour, Bruno. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
- Lee, Yanki. 2008. "Design Participation Tactics: the Challenges and New Roles for Resigners in the Co-design Process." *CoDesign* 4 (1): 31-50. doi: 10.1080/15710880701875613.
- Lidwell, William, Jill Butler, and Kristina Holden. 2003. *Universal Principles of Design: 100 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach Through Design*. Gloucester, Mass.: Rockport.

- Linton, J D, and V.Jayaraman. 2005. "A Framework for Identifying Differences and Similarities in the Managerial Competencies Associated with Different Modes of Product Life Extension." *International Journal of Production Research* 43 (9): 1807-1829. doi: 10.1080/13528160512331326440.
- Lobos, Alex, and Callie W Babbitt. 2013. "Integrating Emotional Attachment and Sustainability in Electronic Product Design." *Challenges* 4 (1): 19-33. doi: 10.3390/challe4010019.
- Loos, Adolf. 1908/1998. *Ornament and Crime: Selected Essays*. Translated by Michael Mitchell, 1998. Edited by Adolf Opel. Riverside, Calif.: Ariadne Press.
- Luckman, Susan. 2015. *Craft and the Creative Economy*. Basingstoke, UK: Hampshire Palgrave Macmillan.
- Maclachlan, Mary, David K. Harrison, and Bruce M. Wood. 2011. "Self-Expression in Product Design." *Design Principles and Practices* 5 (6): 257-271. doi: 10.18848/1833-1874/CGP/v05i06/38220.
- Maggiar, Ambrosie. Original (non-customised) design of *Vodo Masko* table and chair set, 2014. Source: TOG. Accessed 14 March, 2017, <https://www.architonic.com/en/product/tog-vodo-masko/1268256>
- Malandro, Loretta A , Larry L Barker, and Deborah Ann Barker. 1989. *Nonverbal Communication*. 2nd. ed. New York: Random House.
- Malewitz, Raymond 2014. *The Practice of Misuse: Rugged Consumerism in Contemporary American Culture*. Stanford, California: Stanford University Press.
- Malnar, Joy Monice, and Frank Vodvarka. 2004. *Sensory Design* Edited by Frank Vodvarka. Minneapolis, Minn.: University of Minnesota Press.
- Manzini, Ezio. 1995. "Prometheus of the Everyday: The Ecology of the Artificial and the Designer's Responsibility." In *Discovering Design; Exploration in Design Studies*, edited by Richard Buchanan and Victor Margolin, 219-243. Chicago: The University of Chicago Press.
- Manzini, Ezio. 2007. "The Scenario of a Multi-local Society: Creative Communities, Active Networks and Enabling Solutions." In *Designers, Visionaries and Other Stories: A Collection of Sustainable Design Essays*, edited by Jonathan Chapman and Nick Gant, 76-93. London: Earthscan.
- Manzini, Ezio, and Carlo Vezzoli. 2002. *Product-Service Systems and Sustainability: Opportunitites for Sustainable Solutions*. Paris: UNEP Publisher.
- Marchand, Anne. 2009. "Responsible Consumption and Design for Sustainability." Ph D diss. ProQuest Dissertations Publishing.
- Marchand, Anne, Stuart Walker and Tim Cooper. 2010. "Beyond Abundance: Self-Interest Motives for Sustainable Consumption in Relation to Product Perception and Preferences." *Sustainability* 2 (5): 1431-1447.
- Marenko, Betti. 2014. "Neo-Animism and Design." *Design and Culture* 6 (2): 219-241. doi: 10.2752/175470814X14031924627185.
- Marshall, Cora 2010. "A Research Design for Studio-Based Research in Art." *Teaching Artist Journal* 8 (2): 77-87. doi: 10.1080/15411791003618597.

- Maslow, Abraham H. 1943. "A Theory of Human Motivation." *Psychological Review* 50: 373–396.
- Matthewson, Gill. 2012. "'Nothing Else Will Do': The Call for Gender Equality in Architecture in Britain." *Architectural Theory Review* 17 (2-3): 245-259. doi: 10.1080/13264826.2012.730172.
- McCraken, Grant. 1986. "Culture and Consumption: A Theoretical Account of the Structure and Movement of the Cultural Meaning of Consumer Goods." *The Journal of Consumer Research* 13 (1): 71–84.
- McDonagh, Deana, ed. 2004. "Design and Emotion: The Experience of Everyday Things. Paper presented at 3rd *International Conference on Design and Emotion, 2002, Loughborough University*. London: Taylor & Francis.
- McGraw, A Peter, Philip E Tetlock, and Orië V Kristel. 2003. "The Limits of Fungibility: Relational Schemata and the Value of Things." *Journal of Consumer Research* 30 (September): 219-29.
- McKoy, Michael. 2004. "Angling for Endurance." In *Eternally Yours: Time in Design*, edited by Ed van Hinte, 507-510. Rotterdam: 010 Publishers.
- McLeod, Sarah. 2017. "Maslow's Hierarchy of Needs." Simply Psychology. Accessed April 12, 2017. <https://www.simplypsychology.org/maslow.html>
- Miceli, Gaetano "Nino", Francesco Ricotta, and Michele Costabile. 2007. "Customizing Customization: A Conceptual Framework for Interactive Personalization." *Journal of Interactive Marketing* 21 (2): 6-25. doi: <https://doi.org/10.1002/dir.20076>.
- Milech, Barbara, and Ann Schilo. 2004. "'Exit Jesus': Relating to the Exegesis and the Creative/Production Components of a Research Thesis." *TEXT Special Issue* 3 (April), 1–13.
- Miller, Daniel (ed). 2005. *Materiality (Politics, History and Culture)*. Durham: Duke University Press.
- Miller, Daniel. 2006. "Consumption." In *Handbook of Material Culture*, edited by Christopher Tilley, Webb Keane, Susanne Küchler, Mike Rowlands and Patricia Spyer, 341-354. London: SAGE.
- Miller, Daniel. 2010. *Stuff*. Cambridge: Polity Press.
- Mo Works Creative Agency. 2015. "Bemoir — What's your story?" Accessed 15 July <https://www.youtube.com/watch?v=2WWmOzJO2Fo>.
- Moreau, C Page , and Kelly B Herd. 2009. "To Each His Own? How Comparisons with Others Influence Consumers Evaluations of Their Self-Designed Products." *Journal of Consumer Research* 36 (5): 80-819.
- Mugge, R, H N J Schifferstein, and J P L Schoormans. 2006. "A Longitudinal Study on Product Attachment and its Determinants." *European Advances in Consumer Research* 7: 641-647.
- Mugge, Ruth, Hendrik N J Schifferstein, and Jan P L Schoormans. 2010. "Product Attachment and Satisfaction: Understanding Consumers' Post-Purchase Behavior." *Journal of Consumer Marketing* 27 (3): 271-282. doi: 10.1108/07363761011038347.
- Mugge, Ruth, Jan P L Schoormans, and Hendrik N J Schifferstein. 2005. "Design Strategies to Postpone Consumers' Product Replacement: The Value of a Strong Person-Product Relationship." *The Design Journal* 8 (2): 38-48.

- Mugge, Ruth, Jan P L Schoormans, and Hendrik N J Schifferstein. 2009. "Emotional Bonding with Personalised Products." *Journal of Engineering Design* 20 (5): 467-476. doi: 10.1080/09544820802698550.
- Victoria and Albert Museum. 2016. "'Cinderella's Table, by Jeroen Verhoeven, 2005-6." Accessed January 22. <http://www.vam.ac.uk/content/articles/c/cinderella-table/>.
- Naish, John. 2008. *Enough; Breaking Free From the World of More*. London: Hodder & Stoughton.
- NASA. A color-composite image of the Pleiades from the Digitized Sky Survey, n.d. Source: NASA. Accessed 08 January 2014, <http://NASA/ESA/AURA/Caltech/pleiades>.
- Navarro-Astor, Elena, Marisa Román-Onsalo, and Margarita Infante-Perea. 2017. "Women's Career Development in the Construction Industry Across 15 Years: Main Barriers." *Journal of Engineering, Design and Technology* 15 (2): 199-221.
- Naylor, Gillian. 1990. "Swedish Grace... or the Acceptable Face of Modernism." In *Modernism in Design*, edited by Paul Greenhalgh, 164-184. London: Reaktion Books.
- Neher, A. 1991. "Maslow's Theory of Motivation- A Critique." *Journal of Humanistic Psychology* 31 (3): 89-112
- Netsman, Linda and Jona Netsman. *Spoken Leftovers* tables, n.d. Source: Design by Leftovers. Accessed: 14 March, 2017. Source: <http://designbyleftovers.se>
- Netsman, Linda and Jona Netsman. Custom designed range of chairs, n.d. Source: Design by Leftovers. Accessed 14 March, 2017, designbyleftovers.se/wp-content/uploads/2013/04/g13.jpg
- Niedderer, Kristina, Geke Ludden, Stephen Clune, Dan Lockton, James Mackrill, Andrew Morris, Rebecca Cain, Edward Gardiner, Martyn Evans, Robin Gutteridge, and Paul Hekkert. 2016. "Design for Behaviour Change as a Driver for Sustainable Innovation: Challenges and Opportunities for Implementation in the Private and Public Sectors." *International Journal of Design* 10 (2): 67-85.
- Norman, Donald A. 2010. *Living With Complexity*. MIT Press. <http://site.ebrary.com/id/10453043>.
- Noth, Winfried. 1990. *Handbook of Semiotics*. Bloomington: Indiana University Press.
- O'Neill, Saffron J, Maxwell Boykoff, Simon Niemeyer, and Sophie A Day. 2013. "On the Use of Imagery for Climate Change Engagement." *Global Environmental Change* 23 (2): 413-421. doi: 10.1016/j.gloenvcha.2012.11.006.
- Otto, Ton, and Rachel Charlotte Smith. 2013. "Design Anthropology: A Distinct Style of Knowing." In *Design Anthropology: Theory and Practice*, edited by Wendy Gunn, Ton Otto and Rachel Charlotte Smith, 1-39. London: London Bloomsbury.
- Perth Airport. 2017. "Airport Statistics." Accessed 11 May 2017. <https://www.perthairport.com.au/Home/corporate/about-us/airport-statistics>.
- Packard, Vance. 1961. *The Waste Makers*. London: Longmans.
- Pallasmaa, Juhani. 2012. *The Eyes of the Skin: Architecture and the Senses*. 3rd ed. Chichester: Wiley.

- Pamono. Screenshot of Pamono's webpage for search result 'IKEA'. Source: www.pamono.com. Accessed 24 September 2016, <https://www.pamono.com/catalogsearch/result/?q=ikea>
- Papanek, Victor J. 1972. *Design for the Real World*. London: Thames and Hudson.
- Park, Miles. 2010. "Defying Obsolescence." In *Longer Lasting Products; Alternatives to the Throwaway Society*, ed Tim Cooper, 77-106. Surrey, England: Gower Publishing Ltd.
- Parsons, Tim. 2009. *Thinking: Objects: Contemporary Approaches to Product Design*. Lausanne: AVA Academia.
- Pedieliento, Giuseppe, Daniela Andreini, Mara Bergamaschi, and Jari Salo. 2016. "Brand and Product Attachment in an Industrial Context: The Effects on Brand Loyalty." *Industrial Marketing Management* 53: 194-206. doi: 10.1016/j.indmarman.2015.06.007.
- Pellow, David N. 2004. *Garbage Wars: The Struggle for Environmental Justice in Chicago*. Mass., USA: The MIT Press.
- Piller, Frank, Petra Schubert, Michael Koch, and Kathrin Möslein. 2005. "Overcoming Mass Confusion: Collaborative Customer Co-Design in Online Communities." *Journal of Computer-Mediated Communication* 10 (4): 1-25. doi: 10.1111/j.1083-6101.2005.tb00271.x.
- Plummer, Joseph. 1989. "Changing Values: The New Emphasis On Self-Actualization." *The Futurist* 23 (1): 8.
- Ponti, Gio. 699 *Superleggera* chair, 1957. Source: Cassina. Accessed 12 December 2017, <https://www.architonic.com/en/product/cassina-699-superleggera/1138675#&gid=1&pid=3>
- Postrel, Virginia. 2004. "The Marginal Appeal of Aesthetics — Why Buy What You Don't Need?" *Innovation: The Journal of Industrial Designers* 23 (1): 30-36.
- Prahalad, C K, and Venkat Ramaswamy. 2004. "Co-Creation Experiences: the Next Practice in Value Creation." *Journal of Interactive Marketing* (3): 5-14.
- Pulcini, Elena. 2010. "The Responsible Subject in the Global Age." *Science and Engineering Ethics* 16 (3): 447-461. doi: 10.1007/s11948-009-9175-9.
- Pye, David. 1968. *The Nature and Art of Workmanship*. London: The Herbert Press.
- Ramirez, M., Kimmi Ko, and Steve Ward. 2011. "Understanding Long Term Product Attachment with a View to Optimizing Product Lifetime." In *Proceedings of the First International Postgraduate Conference on Engineering, Designing and Developing the Built Environment for Sustainable Wellbeing (eddBE2011) Design, Practice, People, and Systems, Queensland University of Technology*, 42-46.
- Rams, Dieter. *606 Universal Shelving System*, 1960. Source: Vitsoe. Accessed 14 March, 2017. <https://www.vitsoe.com/rw/606/how-it-works>
- Rams, Dieter. *606 Universal Shelving System*, 1960. Source: Vitsoe. Accessed 14 March, 2017, <https://www.vitsoe.com/rw/606/gallery/kitchen>
- Rams, Dieter. *606 Universal Shelving System*, 1960. Source: Vitsoe. Accessed 14 March, 2017, <https://www.vitsoe.com>
- Rams, Dieter. *606 Universal Shelving System*, 1960. Source: Pinterest. Accessed 14 March, 2017. Source: <https://au.pinterest.com/vitsoe/>

Rams, Dieter. *606 Universal Shelving System*, 1960. Source: Dwell. Accessed 14 March, 2017. Source: <https://www.dwell.com/product/article>

Register of the National Estate (Australian Heritage Places Inventory). 2015. *Munday Swamp and Surrounding Bushland*. Accessed 11 February 2015. Australian Government. <https://dmzapp17p.ris.environment.gov.au/ahpi/action/search/heritage-search/record/RNE102483>.

Richins, Marsha L 1994. "Valuing Things: The Public and Private Meanings of Possessions." *Journal of Consumer Research* 21 (3): 504-521.

Ritzer, George, ed. 2008. *The McDonalidization of Society 5/George Ritzer*. 5th ed. Los Angeles, Calif.: Pine Forge Press.

Roberts, Rebecca, ed.. 2007. *The Museum of Modern Art: MoMA Highlights since 1980*. New York: The Museum of Modern Art.

Rompay, Thomas J L van, and Geke D S Ludden. 2015. "Types of Embodiment in Design: the Embodied Foundations of Meaning and Affect in Product Design." *International Journal of Design* 9: 1-11.

Rosenberg, Robert and Peter-Paul Verbeek. 2015. "A Field Guide to Postphenomenology" *In Postphenomenological Investigations: Essays on Human-Technology Relations*. Edited by Rosenberg, Robert and Peter-Paul Verbeek, 9-40. London: Lexington Books.

Roster, Catherine A. 2013. "The Art of Letting Go: Creating Dispossession Paths Toward an Unextended Self." *Consumption Markets & Culture* 17 (4): 321-345. doi: 10.1080/10253866.2013.846770.

Rubenis, Niklavs. 2015. "Crafting Waste: A Re-evaluation of a Furniture Practice." *In Unmaking Waste 2015; Transforming Production and Consumption in Time and Place, Adelaide, South Australia, 22-24 May 2015*, 166-176. Adelaide: University of South Australia.

Russo, B., S. Boess, and P. Hekkert. 2011. "'What's Love Got to Do With It?' The Experience of Love in Person-Product Relationships." *The Design Journal* 14 (1): 8-27. doi: 10.2752/175630610x12877385838687.

Sanders, Elizabeth B, Pieter Jan Stappers. 2008. "Co-creation and the New Landscape of Design" *CoDesign* 4 (1): 5-18

Sartre, Jean-Paul. 1943. *Being and Nothingness; A Phenomenological Essay on Ontology*. New York: Philosophical Library.

Savaş, Özlem 2003. "A Perspective on the Person-Product Relationship: Attachment and Detachment." *In Design and Emotion: The Experience of Everyday Things*, edited by Deana McDonagh, 317-321. London: Taylor & Francis.

Scarpa, Carlo. *Olivetti Building* (detail) Venice, Italy. 1958

Schiermer, Bjørn. 2016. "On the Ageing of Objects in Modern Culture: Ornament and Crime." *Theory, Culture & Society* 33 (4): 127-150. doi: 10.1177/0263276415598625.

Schifferstein, H N J, Ruth Mugge, and Paul Hekkert. 2004. Designing Consumer-Product Attachment. *In Design and Emotion: The Experience of Everyday Things*, edited by Deana McDonagh, Paul Hekkert, Jeroen van Erp and Diane Gyi, 327-331. London: Taylor and Francis.

Schifferstein, Hendrik N J, and Elly P H Zwartkruis-Pelgrim. 2008. "Consumer-Product Attachment: Measurement and Design Implications." *International Journal of Design* 2 (3): 1-13.

Sempe, Inga. *Enveloppe Sofa*, 2008 Source: Sempe, Inga. Accessed 14 April, 2016, <http://www.ingasempe.fr/enveloppe.html>

Shove, Elizabeth, Matthew Watson, Martin Hand, and Jack Ingram. 2007. *The Design of Everyday Life: Cultures of Consumption series*. Oxford: Berg/Oxford International Publishers.

Significant Objects. *Object 10. Duck Nutcracker*, n.d. Source: Significant Objects, posted 14 December, 2009. Accessed 14 March, 2017, <http://significantobjects.com/2009/12/14/duck-nutcracker/>

Sirianni, Nancy J, and John L Lastovicka. 2011. "Truly, Madly, Deeply: Consumers in the Throes of Material Possession Love." *Journal of Consumer Research* 38 (2): 323-342.

Slade, Giles. 2007. *Made to Break: Technology and Obsolescence in America*. Cambridge, MA: Harvard University Press.

Smith, Brewster. 1973. "On Self-Actualization: a Transambivalent Examination of a Focal Theme in Maslow's Psychology." *Journal of Humanistic Psychology* 13 (2): 17-33.

Journal of Humanistic Psychology, 1973, Vol.13(2), pp.17-33

Smith, Nicola Dawn. 2011. "Design Dilemma: Driving a Consumption Obsessed Society into an Unsustainable Future." In *International Postgraduate Conference on Engineering, Designing and Developing the Built Environment for Sustainable Wellbeing (eddBE), Brisbane, Qld: QUT, Feb 07-10 2011*, <http://hdl.handle.net/20.500.11937/14035>.

Smith, Terry. 2007. "The Existential Consumption Paradox: an Exploration of Meaning in Marketing." *The Marketing Review* 7 (4): 325-341.

South West Aboriginal Land and Sea Council. 2012. *Whadjuk in Kaartdijin Noongar- Noongar Knowledge*. Cannington, WA: South West Aboriginal Land and Sea Council.

Sparke, Penny. 1983. *Consultant Design: The History and Practice of the Designer in Industry*. London: Pembrige Press.

Spring, Martin, and Luis Araujo. 2016. "Product Biographies in Servitization and the Circular Economy." *Industrial Marketing Management*. <http://dx.doi.org/10.1016/j.indmarman.2016.07.001>.

Starck, Philippe. *Ola Chic*, 2014. Source: TOG. Accessed 14 March, 2017, <http://www.togallcreatorstogether.com/collections/families/ola-chic/>

Starck, Philippe. *Ola Chic*, 2014. Source: TOG. Accessed 14 March, 2017, <http://www.togallcreatorstogether.com/collections/families/ola-chic/>

Stead, Naomi. 2014. "The State of Gender Equity in Architecture in Australia: The Research is in." *Architecture Australia*. Accessed 25 October 2017. <https://architectureau.com/articles/the-state-of-gender-equality/>.

Stewart, Susan. 1993. *On Longing; Narratives of the Miniature, the Gigantic, the Souvenir, the Collection*. Durham and London: Duke University Press.

Stewart, Susan 1999. "Prologue: From the Museum of Touch." In *Material Memories; Design and*

Evocation, edited by Marius Kwint, Christopher Breward and Jeremy Aynsely, 17-36. Oxford: Berg: Oxford International Publishers.

Strauss, Carolyn F, and Alastair Fuad-Luke. 2008. "The Slow Design Principles: A New Interrogative and Reflexive Tool for Design Research and Practice." In *Changing the Change: Design, visions Proposals and Tools*. Edited by Carla and Peruccio Cipolla, and Pier Paolo, 14. Torino, Italy: Alemandi Conference Press, 2008. <http://www.allemandi.com/university/ctc.pdf>.

Style at Home, Canada. Magazine cover, October 2016. Source: Style At Home. Accessed 5 November, 2016, <https://secure.styleathome.com/online-store/index.php?feature=SLMI16100001&>

Teichmann, Karin, Ursula Scholl-Grisseemann, and Nicola Stokburger-Sauer. 2016. "The Power of Codesign to Bond Customers to Products and Companies: The Role of Toolkit Support and Creativity." *Journal of Interactive Marketing* 36: 15.

Thomson, Matthew, Deborah J Macinnis, and C Whan Park. 2005. "The Ties That Bind: Measuring the Strength of Consumers' Emotional Attachments to Brands." *Journal of Consumer Psychology* 15 (1): 77-91. doi: 10.1207/s15327663jcp1501_10.

Thorpe, Ann. 2007. *The Designer's Atlas of Sustainability*. Washington: Island Press.

Thorpe, Ann. 2010. "Design's Role in Sustainable Consumption." *Design Issues* 26 (2): 3-16. doi: 10.1162/DESI_a_00001.

Tilley, Christopher. 2006. "Objectification." In *Handbook of Material Culture*, edited by Christopher Tilley, Webb Keane, Susanne Kuchler, Mike Rowlands and Patricia Spyer, [page range]. London: Thousand Oaks.

Tobin, S S. 1996. "Cherished Possessions: The Meaning of Things." *Generations* 20 (3): 46-46.

TOG. 2017a. "Customisation." Accessed 19 January 2017. <http://www.togallcreatorstogether.com/customisation>.

TOG. 2017b. "What's TOG?; TOG: All Creators Together." Accessed 19 January 2017. <http://www.togallcreatorstogether.com/whats-tog-2/>.

Trigg, Andrew B. 2004. "Deriving the Engel Curve: Pierre Bourdieu and the Social Critique of Maslow's Hierarchy of Needs." *Review of Social Economy*, 62 (3): 393-406, doi: 10.1080/0034676042000253987

Urquiola, Patricia. *Smock*, 2005. Source: Moroso. Accessed 14 March, 2017, <http://moroso.it/famiglia/smock/?lang=en>

Valenzuela, Ana, Ravi Dhar, and Florian Zettelmeyer. 2009. "Contingent Response to Self-Customization Procedures: Implications for Decision Satisfaction and Choice." *Journal of Marketing Research* 46 (6):754-763. doi: 10.1509/jmkr.46.6.754.

van Lieshout, Ingeborg. 2010. "Guy Keulemans." *ArchitectureAU*, Accessed 03 March 2017 <http://architectureau.com/articles/guy-keulemans/>.

van Hinte, Ed. 1997. *Eternally Yours: Visions on Product Endurance*. Rotterdam: 010 Publishers.

van Hinte, Ed. 2004. *Eternally Yours; Time in Design: Product, Value, Sustenance*. Rotterdam: 010 Publishers.

van Nes, Nicole. 2010. Replacement Behaviour and Design Solutions. In *Longer Lasting Products; Alternatives to the Throwaway Society*, edited by Tim Cooper, [page range]. Surrey, England: Gower Publishing.

van Schaik, Leon. 2013. "Practice Makes Perfect." *The Architectural Review* 234 (1400): 82-87.

Verbeek, Peter-Paul. 2004. "Material Morality." In *Eternally Yours: Time In Design: Product, Value, Sustenance*, edited by Ed van Hinte, [page range]. Rotterdam: 010 Publishers.

Verbeek, Peter-Paul. 2005. *What Things Do: Philosophical Reflections on Technology, Agency, and Design*. Translated by Robert P. Crease. University Park: Pennsylvania State University Press.

Viemeister, Tucker. 2003. "'Beautility' Innovation." *The Journal of the Industrial Designers Society of America* 20 (3): 38-41.

Vihma, Susann. 1995. *Products as Representations: A Semiotic and Aesthetic Study of Design Products*. Helsinki: University of Art and Design.

Vitsoe. 2016. "606 Universal Shelving System." Vitsoe. Accessed 24 January 2017. <https://www.vitsoe.com/rw/606>.

Walker, Rob, and Joshua Glenn. 2009-2016. "Significant Objects... and how they got that way/Duck Nutcracker." Accessed 11 November 2016. <http://significantobjects.com/2009/12/14/duck-nutcracker/>.

Walker, Stuart. 2006a. "Object Lessons: Enduring Artifacts and Sustainable Solutions." *Design Issues* 22 (1): 20-31. doi: 10.1162/074793606775247763.

Walker, Stuart. 2006b. *Sustainable by Design: Explorations in Theory and Practice*. London: Earthscan.

Walker, Stuart. 2010. "Wrapped Attention: Designing Products for Evolving Permanence and Enduring Meaning." *Design Issues* 26 (4): 94-108.

Walker, Stuart. 2011a. "Longer Lasting Products: Alternatives to the Throwaway Society." *The Design Journal* 14 (3): 375-380. doi: 10.2752/175630611x13046972591003.

Walker, Stuart. 2011b. *The Spirit of Design: Objects, Environment and Meaning*. London: Earthscan: Taylor and Francis.

Walker, Stuart. 2013. "Imagination's Promise: Practice-Based Design Research for Sustainability." In *The Handbook of Design for Sustainability*, edited by Stuart Walker and Jacques Giard, 446-465. London: Bloomsbury Academic.

Walker, Stuart. 2014. *Designing Sustainability; Making Radical Changes in a Material World*. New York: Routledge.

Wallendorf, Melanie, and Eric J. Arnould. 1988. "'My Favorite Things': A Cross-Cultural Inquiry into Object Attachment, Possessiveness, and Social Linkage." *Journal of Consumer Research* 14: 531-547.

Wegner, Hans. CH24 Wishbone chair, 1950. Source: Hive Modern. Accessed 12 December 2017, <https://hivemodern.com/pages/product202/carl-hansen-hans-wegner-ch24-wishbone-chair>

Weiner, Annette B. 1992. *Inalienable Possessions: the Paradox of Keeping-While-Giving*. Berkeley: University of California Press.

Wendt, Thomas. 2015. *Design for Dasein; Understanding the Design of Experiences*. Charleston: Thomas Wendt.

Whybrow, Peter. 2005. *American Mania: When More is Not Enough*. New York: W. W. Norton & Company.

Whybrow, Peter C. . 2009. "Special Article: Dangerously Addictive. Why We are Biologically Ill-suited to the Riches of Modern America " *Neuropsychiatry i Neuropsychologia*, 4 (3-4): 111-115.

Woodward, Sophie. 2013. *Material Culture* (definition) Source: Oxford Bibliographies. Accessed 08 May, 2018. <http://www.oxfordbibliographies.com/view/document/obo-9780199766567/obo-9780199766567-0085.xml>

Woolley, Martin. 2003. "Choreographing Obsolescence — Ecodesign: the Pleasure/Dissatisfaction Cycle." In *Proceedings of the 2003 International Conference on Designing Pleasurable Products and Interfaces, Pittsburgh, PA, 23-26 June, 2003*, 77-81.

World Market Intelligence (Wood Based Panels International) 2016. "World Furniture Consumption Increases by 35%." *Progressive Media* 5.

Yalch, Richard, and Frederic Brunel. 1996. "Need Hierarchies in Consumer Judgments of Product Designs: Is it Time to Reconsider Maslow's Theory?" *Advances In Consumer Research* 23: 405-410.

Yates, Amanda. 2014. *Appendix G: Report on a Desk Top Assessment of the Aboriginal Heritage of Stirling Crescent LSP High Wycombe*. http://www.kalamunda.wa.gov.au/files/f650b920-4d09-478c-b8dc-a46b00d62473/150205-1944-Stirling-Crescent-Local-Structure-Plan-Report-FINAL_9.pdf.

Yb, Phillip. 'Soil Drought' Stock photo ID: 312820436 (n.d). Source: Shutterstock. Accessed 08 January 2014, <https://www.shutterstock.com/image-photo/cracked-soil-texture-482864143>

Every reasonable effort has been made to acknowledge the owners of copyright material. I would be pleased to hear from any copyright owner who has been omitted or incorrectly acknowledged.

APPENDICES

Appendix A

Data Collection *En-case and For Now, For All-ways*

1. Interview schedule for initial data collection

- I have received information regarding this research and had an opportunity to ask questions. I believe I understand the purpose, extent and possible risks of my involvement in this project and I voluntarily consent to take part.

Please answer each question highlighted in **bold**. The subsequent questions are to be considered, but not required to be answered directly. Please remember that this project is about creating new intergenerational heirlooms, that is, any **common themes that are meaningful across generations**.

IMPORTANT NOTES:

As we would like to represent important 'things' to you and your family (be it people, places, events, objects), please don't expect that you need to provide an answer that will be the exact 'thing' that will be visually presented in the furniture. For example, if you enjoy cooking and large family gatherings for meals, don't be concerned that this means that I (the designer/ researcher) will incorporate a picture of a saucepan in the work. This is a questioning process to uncover things that you feel are important to you as a person and then from there, we will further discuss it and I will propose the best visual means to represent it.

We want the outcome to be something that becomes a special piece of furniture for you and that is associated with positive emotions, memories of the past, qualities that make you and your family who you are, as this typical of heirloom objects. If a question doesn't resonate with you and after considering it for some time, you can't think of anything in that category that is special or has precious memories associated with it, then feel free to skip that question. Likewise, if there is something that you would very much like to be represented but hasn't been touched on in these questions, please feel free to add it to the forms.

Consider when you answer these questions, that I am trying to get a sense of who you/ your family/ your ancestors are, so that I can consider how this furniture may have meaning across multiple generations. For some people, carrying on family traditions may be important, but for others, this may not be so important. So, if you feel for example that your ancestry and cultural upbringing are not important or haven't played a large role, or it is associated with bad memories or the like, that is fine. Just let me know what is important to you now and you think will be important to you/ your family in the future.

Dot points are fine. We can discuss it in further detail later in the interview if necessary.

Showing photos or actual objects that are special are fine too (just be sure to protect it). Either provide me with a photocopy I can take or I can take a photo of it if you prefer. Feel free to add extra pages if needed, please just be sure to number or staple it together so it is coherent.

This questionnaire is broken down into three sections;

1. The Big Picture focuses on the past and your ancestry to get a broad picture of your background and your non-immediate family members.

2. The 'Now' focuses on your current immediate family and your sense of identity in the present. Of course, this may relate to the past events, but in this section, we will focus more on you and your immediate family.
3. Where to next? Focuses on the next generation of your family and your family's future aspirations.

THE BIG PICTURE – YOUR ANCESTRY

- 1 a- Our background influences our current lives. I'd like to get a holistic view of your identity. Is there anything about your parents, extended family or cultural background that you feel is a significant part of your identity;** such as significant events, places, people or objects that you feel is of significance? For example, you may have a love of gardening, and perhaps this can be traced back to learning to grow vegetables from your grandparent's farm. Is there something about the place where your grandparents, or great grandparents lived, or traditions like religious, cultural background that you would like represented?
- 1b. Do you own any object/s that you strongly associate with family, tradition, family rituals or ancestors that provide positive emotions or (emotional) comfort to you?** i.e. perhaps the object makes you happy or smile as it helps you recall a memory, or maybe there is something quirky about your family that you love that can be represented in an object. Is there something that makes your family special/ unique? (multiple generations have had aviaries and you have a vast collection of feathers). You can even discuss an object that perhaps you don't own but the memory of it has some special family/ ancestral meaning to you.
- 1c. What are some of your fondest and most significant memories from childhood?** Was it with your family (beach holidays, activities you did together, being taught to stitch by a grandmother, or collecting eggs from the chicken coup etc....) or was it something you did alone (drawing, making "god's eyes/ string art" with yarn, collecting insects and found objects) or with friends ('adventures' in bushland etc...) Why are these particular memories special, is it a feeling it represents or a person, or how it developed into a future career etc....?

NOW- YOUR IMMEDIATE FAMILY

- 2a. What are the five most significant EXPERIENCES that give you a sense of belonging or forms your and/or your family's identity? Why are they significant?** i.e. events, places, times of your life, or people in your life? For example, perhaps you met your partner at a yacht club as kids and you still sail together, or you live by the beach and do lots of fishing, and the kids love collecting shells and looking at the fish scales etc...
- 2b. Name and describe five of your most precious (inanimate) OBJECTS that reflect you or your family's identity.** Similarly, to the previous question why it is so precious? Would you like to have this re-presented in the furniture project?
- 2c. Describe your favourite place in and about your 'home' town or something that makes you feel connected to it in some way.** Why do you think this is your favourite place? What do you think it represents or means to you? Is there something 'special' or particular that reminds you of this place and no other? Is there is another place more significant to you than your home town? For example; the Sydney's architectural iron work of terrace house may remind you of your home town of Sydney, or flowering Jacarandas may remind you of the

specific street you grew up on. If there is nothing specifically relevant, there is no need to 'force' an answer.

WHERE TO NEXT?

- 3a. Do you have any family heirlooms that you hope to pass on to your children? If so, can you describe what it is, how it came into your possession and what makes it special?**
- 3b. If you have children of your own, what would you like them to remember about their childhood?** Do you have any special or unique traditions that you hope they will carry on with their children in the future?
- 3c. Are there anything other past experiences or future aspirations that you would like to discuss?**

If you have completed the questionnaire, please keep it for when we meet and conduct the face-to-face interview, so that I can add any of my own notes, ask any questions and/or add photos to it.

Thank you for your time and I will be in contact on the following date to arrange a meeting: __/__/2015

2. Interview schedule for feedback

After our initial meeting to discuss your family, I began by presenting drawings as illustrations that reflected this discussion.



1a- As illustrations were presented to you, how did you feel it related to your family history, values, identity or memories? Which illustrations resonated immediately with you, and which didn't? Why?

1b. Some illustrations (such as the dice and horse) was discarded, can you explain why it was important to exclude that?

1c. Which, if any, illustrations recall past memories in a positive light?

1d. Which, if any, illustrations recall past memories in a negative light?

1e. Describe your family's feelings when you first saw the finished work.



2a. How have your feelings changed towards this work over time, if at all?

2b. How long do you anticipate you will keep this furniture for? And why do you think that?

2c. Do you think you would keep this for more or less time than a store-bought equivalent that has no personalisation features (such as the engraving)?

2d. Do you think you would pass this onto your children or other significant people if you don't want/ need it in the future?

2e. What specifically is the most important feature/s of the work that contribute to why you would keep this?

2f. Has there been any disappointments with the outcome? Is there any reason why you may dispose of this product prior to the end of its usefulness?

2g. Any further comments?

- I have received information regarding this research and had an opportunity to ask questions. I believe I understand the purpose, extent and possible risks of my involvement in this project and I voluntarily consent to take part.

Please remember that the overall PhD project is about creating intergenerational heirlooms, so in order to understand what people think about heirlooms, I will be asking you questions about objects that have been passed onto others, or you think will be passed onto others as precious objects. I may also take photos of your objects that you will be discussing.

IMPORTANT NOTES:

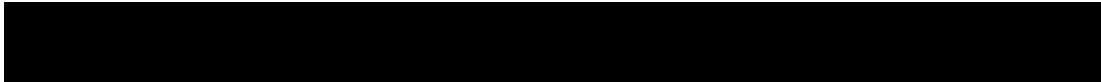
If a question is too uncomfortable for you, you do not need to answer it. Likewise, if there is something that you would very much like to be discussed in relation to your heirlooms but hasn't been touched on in, please feel free to discuss. The interview questions are a guideline and the interviewee may ask other questions based on the conversation direction.

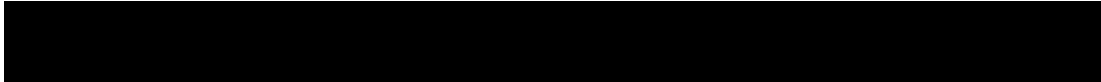
This interview is broken down into three sections;

1. Receiving custodial objects- What you have already received as a 'special' object that was considered special by the previous owner, that is, something that was bequeathed or given to you as an owner to take care of the special object. (1-2 objects)
2. Giving custodial objects- What you have that is special or precious and you would like to pass on to someone else as a 'special' object. (1-2 objects)
3. Do you have any other general thoughts about 'special' objects you'd like to discuss.?



- 1a) Have you received any object/s that were understood as a 'special' object, or heirloom that is expected to be kept and cared for as an heirloom?
- 1b) What is your relationship with the giver? (Are you related/ how) and how long have you had the object? How long did the original owner/s have it?
- 1c) Were you aware that the giver was going to give this to you long in advance or with little/ no notice?
- 1d) Do you feel the same or differently towards the object than the giver and why do you think that is?
- 1e) Do you feel you need to take care of it?
- 1f) Do you feel you need to pass it onto another person that will also take care of it? If so why and how do you feel about this?
- 1g) Do you feel that you can change the object in some way to make it more useful/ practical/ loved by you? Or would that not be appropriate? Or impossible? What aspects of the object do you think you can change or what parts do you need to retain exactly as it is?
- 1h) What is your overall feeling towards to object?

- 
- 2a) Do you have any object/s that you feel are a 'special' object, or heirloom that is expected to be kept and cared for as an heirloom in the future by someone else?
 - 2b) What is your relationship with the person you intend to give it to? (Are you related/know each other/ how)
 - 2c) How long have you had the object? Is it new, second-hand etc...
 - 2c) How do you feel about the object and why do you consider it 'special' or a future heirloom?
 - 2e) Do you feel you need to take care of it for future generations?
 - 2f) Do you feel you need to pass it onto another person that will also take care of it? If so why and how do you feel about this?
 - 2g) Do you feel that you can change the object in some way to make it more useful/ practical/ loved by you? Or would that not be appropriate? Or impossible? What aspects of the object do you think you can change or what parts do you need to retain exactly as it is?
 - 2h) What is your overall feeling towards to object?
 - 2i) Did you acquire this object by specifically seeking out something that would be an heirloom or did it just 'happen'?
 - 2j) Do you discuss the special qualities of the/these objects with others? Are they the people you would consider giving it to?

- 
- 3a) Do you show/ present or conceal your special objects?
 - 3b) Do you use them or not, and why?
 - 3c) Do you think you would like more or less 'special objects'? (as opposed to throw away objects or objects that you think would not be special to others?)
 - 3d) Is there anything further you would like to discuss?

Thank you for your time and I will be in contact on the following date to arrange a meeting:

Appendix C

Survey results

Understanding what furniture we throw away, keep and pass on.

Table C-1. Respondents age, gender and occupation. Forlano, 2016.

18-34	33%	27
35-54	60%	50
55-64	2%	2
65-74	5%	4
75 or older	0%	0
Male	23%	19
Female	77%	64
Yes	42% (8)	42% (27)
No	58% (11)	58% (37)

Table C-2. Ownership attitudes by gender. Forlano, 2016.

You have received an object you consider to be an heirloom	61% (11)	73% (47)
When you seek out furniture, you generally expect it to last less than 5 years	2 % (2)	0% 3% (2)
When you seek out furniture, you generally expect it to last 5-10 years	23% (19)	32% (6) 21% (13)
When you seek out furniture, you generally expect it to last 10- 20 years	28% (23)	11% (2) 33% (21)
When you seek out furniture, you generally expect it to last more than 20 years or to be passed onto others	20% (16)	32% (6) 16% (10)
Other (depends on furniture type, not responsible for furn. purchases etc...)	27% (22)	26% (17) 27% (17)

Table C-3. Bequeathment attitudes by gender. Forlano, 2016

No, I have nothing- total	11%	9
No, I have nothing- male	16%	3
No, I have nothing- female	9%	6
Yes, furniture- total	45%	37
Yes, furniture- male	42%	8
Yes, furniture- female	45%	29
Yes, domestic objects other than furniture - total	36%	30
Yes, domestic objects other than furniture- male	21%	4
Yes, domestic objects other than furniture- female	41%	26
Yes, personal objects (jewelry, clothing)- total	69%	57
Yes, personal objects (jewelry, clothing)- male	47%	9
Yes, personal objects (jewelry, clothing)- female	75%	48
Yes, leisure objects (musical/ sporting equip...)- total	11%	9
Yes, leisure objects (musical/ sporting equip...)- male	21%	4
Yes, leisure objects (musical/ sporting equip...)- female	8%	5
Yes, collectible items (trading cards, artworks...)-total	31%	26
Yes, collectible items (trading cards, artworks...)- male	32%	6
Yes, collectible items (trading cards, artworks...)-female	31%	20
Yes, photographic records - total	60%	50
Yes, photographic records- male	58%	11
Yes, photographic records -female	61%	39
Yes, other -total	9%	7
Yes, other- male	11%	2
Yes, other- female	8%	5

Table C-4. Design and experiential perception of heirlooms by profession. Forlano, 2016.

Heirloom furniture is typically simple in form and elegant.		
Disagree	23% (8)	15% (7)
Somewhat disagree	28% (10)	29% (14)
Neutral	26% (9)	33% (16)
Somewhat agree	20% (7)	19% (9)
Agree	3% (1)	4% (2)

Heirloom furniture may be mass-produced.		
Disagree	14% (5)	23% (11)
Somewhat disagree	23% (8)	37% (18)
Neutral	11.5% (4)	19% (9)
Somewhat agree	31.5% (11)	19% (9)
Agree	20% (7)	2% (1)
Heirloom furniture is typically expensive.		
Disagree	14.5% (5)	6% (3)
Somewhat disagree	17% (6)	21% (10)
Neutral	20% (7)	21% (10)
Somewhat agree	34% (12)	40% (19)
Agree	14.5% (5)	12% (6)
Heirloom furniture is old.		
Disagree	23% (8)	2% (1)
Somewhat disagree	9% (3)	12.5% (6)
Neutral	17% (6)	12.5% (6)
Somewhat agree	48.5% (17)	52% (25)
Agree	2.5% (1)	21% (10)
Heirloom furniture has personal significance.		
Disagree	0	0
Somewhat disagree	6% (2)	2% (1)
Neutral	6% (2)	0
Somewhat agree	31% (11)	37% (18)
Agree	57% (20)	61% (29)
Heirloom furniture is rare or difficult to replicate.		
Disagree	6% (2)	0
Somewhat disagree	17% (6)	12% (6)
Neutral	11% (4)	17% (8)
Somewhat agree	43% (15)	44% (21)
Agree	23% (8)	27% (13)
Heirloom furniture is memorable and unique in appearance.		
Disagree	3% (1)	2% (1)
Somewhat disagree	14% (5)	6% (3)
Neutral	11.5% (4)	15% (7)
Somewhat agree	40% (14)	48% (23)
Agree	31.5% (11)	29% (14)

Heirloom furniture is not made of man-made materials, such as plastic.		
Disagree	20.25% (7)	10% (5)
Somewhat disagree	40.25% (14)	29% (14)
Neutral	14% (5)	17% (8)
Somewhat agree	14% (5)	21% (10)
Agree	11.5% (4)	23% (11)
Heirlooms are aesthetically 'timeless'.		
Disagree	14% (5)	10% (5)
Somewhat disagree	29% (10)	25% (12)
Neutral	9% (3)	21% (10)
Somewhat agree	34% (12)	29% (14)
Agree	14% (5)	15% (7)
Heirlooms have an old, aged or patinated surface.		
Disagree	26.5% (9)	10.5% (5)
Somewhat disagree	14.5% (5)	19% (9)
Neutral	32.5% (11)	35.5% (17)
Somewhat agree	20.5% (7)	27% (13)
Agree	6% (2)	8% (4)
Heirloom furniture is well made.		
Disagree	3% (1)	0
Somewhat disagree	5.5% (2)	6% (3)
Neutral	8.5% (3)	17% (8)
Somewhat agree	26% (9)	44% (21)
Agree	57% (20)	33% (16)
Heirloom furniture is only an heirloom to those who know the history of the object.		
Disagree	6% (2)	13% (6)
Somewhat disagree	14.5% (5)	17.5% (8)
Neutral	6% (2)	10.5% (5)
Somewhat agree	41% (14)	56.5% (26)
Agree	32.5% (11)	2.5% (1)
Heirloom furniture is often made by someone the possessor knows.		
Disagree	31% (11)	23% (11)
Somewhat disagree	23% (8)	33.5% (16)
Neutral	20% (7)	29% (14)
Somewhat agree	26% (9)	12.5% (6)
Agree	0	2% (1)

Heirloom furniture reminds the possessor of the past.		
Disagree	6% (2)	0
Somewhat disagree	3% (1)	2% (1)
Neutral	6% (2)	15% (7)
Somewhat agree	42.5% (15)	50% (24)
Agree	42.5% (15)	33% (16)
The heirloom status of furniture has nothing to do with how it looks.		
Disagree	6% (2)	8% (4)
Somewhat disagree	6% (2)	12% (6)
Neutral	20% (7)	24% (11)
Somewhat agree	34% (12)	26% (12)
Agree	34% (12)	30% (14)
The form of heirloom furniture should fit into any interior decor.		
Disagree	26% (9)	21% (10)
Somewhat disagree	40% (14)	33% (16)
Neutral	25.5% (9)	29% (14)
Somewhat agree	5.5% (2)	15% (7)
Agree	3% (1)	2% (1)
Heirloom furniture is something rare, like a limited edition or collectible, that is no longer in production.		
Disagree	17% (6)	12% (6)
Somewhat disagree	17% (6)	23% (11)
Neutral	23% (8)	12% (6)
Somewhat agree	37% (13)	33.5% (16)
Agree	6% (2)	19.5% (9)
Heirlooms are not machine made, and have a handmade quality.		
Disagree	29% (10)	8% (4)
Somewhat disagree	17.5% (6)	25% (12)
Neutral	20.5% (7)	21% (10)
Somewhat agree	26.5% (9)	31% (15)
Agree	5.5% (2)	15% (7)
Heirloom furniture is a burden because its emotionally harder to throw away.		
Disagree	17.5% (6)	8.5% (4)
Somewhat disagree	15% (5)	12% (6)
Neutral	20.5% (7)	19% (9)
Somewhat agree	44% (15)	52% (25)
Agree	3% (1)	8.5% (4)

Heirloom furniture is something to be cared for and maintained for future generations.		
Disagree	0	0
Somewhat disagree	0	4% (2)
Neutral	9% (3)	15% (7)
Somewhat agree	54% (19)	50% (24)
Agree	37% (13)	31% (15)
Heirloom furniture is difficult to live with if it doesn't suit my aesthetic taste.		
Disagree	14% (5)	2% (1)
Somewhat disagree	17% (6)	10% (5)
Neutral	9% (3)	21% (10)
Somewhat agree	43% (15)	48% (23)
Agree	17% (6)	19% (9)
Heirloom furniture isn't something you can buy at a shop, it becomes an heirloom over time through personal experience or history associated with the object yet.		
Disagree	6% (2)	2% (1)
Somewhat disagree	6% (2)	15% (7)
Neutral	8% (3)	8% (4)
Somewhat agree	26% (9)	42% (20)
Agree	54% (19)	33% (16)
Heirlooms (furniture or otherwise) are things that remind the possessor of who they are. It tells part of their, or other people's, life story.		
Disagree	0	0
Somewhat disagree	0	4% (2)
Neutral	14% (5)	8% (4)
Somewhat agree	26% (9)	46% (22)
Agree	60% (21)	42% (20)
Heirlooms (furniture or otherwise) have a sense of nostalgia visible in its design or appearance.		
Disagree	6% (2)	2% (1)
Somewhat disagree	9% (3)	15% (7)
Neutral	16.5% (6)	19% (9)
Somewhat agree	45.5% (16)	35% (17)
Agree	23% (8)	29% (14)

Note: Tables used within the main text body are not repeated in this appendix. Full text answers are not included. Selected text answers are included within main body text.

Appendix D Certificates

1. Certificate of registration for the *En-case* product



CERTIFICATE OF REGISTRATION DESIGN

Registration Number: 201613566

The Registrar of Designs has registered the design, the representation(s) attached, and certifies that the following particulars have been entered in the Register of Designs

Name and Address of Owner(s):
Penelope Forlano
9 Morse Road Bibra Lake WA 6163 Australia

Name of Designer(s):
Penelope Forlano

Product in respect of which the design is registered: Furniture

Date on which Application for Registration of the Design was filed: 6 July 2016

Date of Registration: 22 July 2016

Term of Initial Registration: Five years commencing on 6 July 2016

Statement of Newness and Distinctiveness:

The newness and distinctiveness of the design resides in the application of patterning on the surfaces of the cubes and the corner junctions of the cubes. Note each of the four corner junctions is different. The cube shape and possibilities for arrangement are not part of the design's uniqueness. The depth, width and height of the furniture varies. The engraved patterns vary and can be applied to various sides. The patterns shown are indicative of the appearance of engraved patterns.



DESIGNS ACT 2003

The Australian Designs Register is the official record and should be referred to for the full details pertaining to this IP Right.

2. Certificate of examination for the *En-case* product.



CERTIFICATE OF EXAMINATION

DESIGN

Registration Number: 201613566

The Registrar of Designs certifies that examination has been completed for the registered Design No. 201613566

Date on which Design was certified: 2 November 2016



DESIGNS ACT 2003

The Australian Designs Register is the official record and should be referred to for the full details pertaining to this IP Right.

Appendix E Marketing of furniture as ‘seasonal’

Evidence of the marketing of ‘seasonal’, yet durable furniture.



Figure E-1. Freedom Furniture. Catalogue cover, 2016.



Figure E-2. Harvey Norman. Catalogue cover, 2016.



Figure E-3. Domayne Furniture. Catalogue, November 2016



Figure E-4. Furniture Bazaar. Furniture Catalogue, September 2016



Figure E-5. *Style at Home*, Canada. Magazine cover, October 2016.

Source: Style At Home. Accessed 5 November, 2016, <https://secure.styleathome.com/online-store/index.php?feature=SLMI1610001&>



Figure E-6. *Chicago Home + Garden*. Magazine cover, Summer 2012.

Source: Home and Garden. Accessed 5 November, 2016, <http://www.chicagomag.com/>



Figure E-7. *Inside Out* - Australia. Magazine cover, n.d.

Source: Inside Out. Accessed 5 November, 2016, <http://www.insideout.com.au>



Figure E-8. *Elle Décor* (UK). Magazine cover, June 2009.

Source: Elle Décor. Accessed 5 November, 2016, <http://www.aphrochic.com/2009/06/01/elle-decor-summer-chic/comment-page-1/>

Appendix F

Evidence of ‘dis-domesticated’ furniture



Figure F-1. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia.



Figure F-2. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia.



Figure F-3. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia, 2016.



Figure F-4. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia, 2016.



Figure F-5. Dis-domesticated furniture for verge side ‘waste collection’ by council. Applecross, Western Australia, 2016.

1. Expert review by a senior design curator.

Received via email correspondence dated: 08.09.2016

The aim to encourage long term custodianship and intergenerational attachment to designed objects is a noble ambition, particularly given current global and environmental challenges. The disposability of furniture has become extremely problematic in recent years and can be predominantly attributed to a significant increase in low cost manufacturing. The majority of furniture items produced today are manufactured using low cost materials and volume production techniques which do not enlist traditional craftsmanship and materials. This has proven prohibitive to long-term intergenerational ownership. The bespoke work *The Unforgotten* sideboard has been crafted from American black walnut, a premium cabinetmaking timber which would ordinarily attract a high sale price and by default would likely become an heirloom object even without the application of customised engravings. This therefore raises the question of whether the sideboard is the most appropriate application of ideas outlined in the paper '*Making custodians; furniture as intergenerational objects*'. Perhaps a more pressing and significant execution of the ideas would be an application to high volume commercially manufactured products, which would encourage long term custodianship to items with a lower cost of manufacture and which are accessible to all.

In my opinion *The Unforgotten* sideboard is less successful than the *Endless Quilt* in that it doesn't have the capability to add and subtract stories in the same way that the quilt is able to, due to its modularity. The sideboard captures stories only at the time of its manufacture and in theory does not have the same capacity to collect stories throughout its life. Its history therefore stops at a particular point in time, memorialising the past. It is impossible to determine whether the representation of these specific moments or the somewhat restrictive representation of time, will necessarily resonate with future custodians. I would also argue that it is not always possible to artificially construct sentiment or for objects to be fabricated in a way to ensure that they are 'deeply meaningful'. The translation of 'physical possessions' applied to the two works may not necessarily be enough to encourage object attachment to their current or subsequent owner(s). Personal attachment may often only be achieved through the application of new memories or associations. Perhaps a better execution of the ideas outlined in the paper would be to encourage the design of objects in a way that opens possibilities for connection and more broadly facilitates a space for attachment and long term custodianship, without the literal representation or direct documentation of specific memories.

2. Expert review by arts and crafts researcher and advocate.

Received via email correspondence dated: 08.09.2016

Review for Penelope Forlano: *Endless Quilt* and *The Unforgotten*

Through our series of exhibitions *Living Treasures Masters of Australian Craft*, we have sought to showcase the very best makers working in their various fields in Australia today. This series, along with the fine exhibitions *Wood, Glass* and the upcoming *Steel* by Jamfactory in Adelaide include some of the very finest Australian designers. There are many, many designers working in Australia today that are making work that is built to last, is steeped in storytelling and uses technology, natural materials and pushes the boundaries of practice into new and innovative ways while employing traditional craftsmanship. There are equally a great number taking inspiration from design traditions outside of Australia and seeking to pare back and present work that is often devoid of personality. Penelope Forlano seeks to challenge and find alternatives to this part of the design industry that seems to think that timelessness means simple, modernist and anonymous – a sort of 'Danification' of design.

Endless Quilt is a poetic, deeply personal and exquisite work imbued with layers of meaning from generations of Forlano's family experience. Co-creating this work with her family and taking the familial and personal approach of piecing together memory and experience, that we associate with traditional quilting, is the total antithesis to the contemporary simple, functional piece of furniture coveted by so many as good design. *Endless Quilt*, so completely unique, finely crafted and embedded with a lifetime of memory and experience is an exceptional example of how Australian design can envelope personal history and be loved by generations.

In *The Unforgotten* Forlano takes the concept of the *Endless Quilt* and makes a custom designed furniture piece that holds within its surfaces personal memories. The work references the family heirloom antique bureau or chest of drawers where love letters or small objects of significance are secreted away under layers of clothing or in hidden drawers only to be found many years later or after a loved one passes away. It is this piece that could be commissioned many times over, each time uniquely embodying, the commissioner's personal artefacts within the design of the piece. Again, finely crafted, employing latest technology and personalising the work, make *The Unforgotten* a family heirloom that will be passed down through generations and not find itself in a few short years tossed aside for the next new thing.

Australian designers would do well to look to Indigenous design for inspiration which has at its core storytelling, memory, family, culture, usability, durability, innovation, technique and sustainable materials used for millennia. Penelope Forlano in her work is seeking to create cultural objects that have these qualities. While there are a few designers seeking to create a new Australian aesthetic, too often this reflects popular trends rather than the deep human experience that characterises Forlano's work.

3. Expert review by practicing designer and academic.

Received via email correspondence dated: 15.08.2016

A REVIEW OF PENELOPE FORLANO'S FURNITURE WORKS The Unforgotten **AND** Endless Quilt **INFORMED BY HER WRITTEN TEXTS AND IMAGES**

Forlano proposes that furniture should be more personal and client or family specific in design in order to establish stronger emotional connections with owners as a means to reduce waste. I broadly support this proposition and cannot, and do not, want to offer any rebuttal to it. To avert and reduce the appalling waste caused by normative industrial design, and the hyperconsumerism it has facilitated, requires designers to propose and develop sustainable counter-methods of product design: Forlano has done so.

Likewise, the two prototypes offered as proof of concept for this proposition are skilfully made and likely to be highly durable. I mention durability specifically because of its critical requirement for long lived objects; it can be imagined that some objects only become heirlooms because of it, via a process of elimination as their rival, products wear out and are replaced. I would love to examine Forlano's furniture up close, but in absence of this opportunity have no doubt about her expertise. It is clear from images. An additional benefit of her proposition must be that if stronger emotional attachments are formed, so must be the desire for maintenance, another critical requirement of product longevity.

So what I would now like to discuss in this review are two issues, that I present as critical questions, concerning information that is not present or fully clear in the texts and images.

ONE: Form/concept relationships

How does specific features of the formal design, for example, and in particular, the triangular facet shapes, and bent steel legs in the console, work to empower the concept?

This not quite clear, and without explanation these features seem arbitrary. For example, the triangular facets could presumably be replaced by rectilinear facets, or some other geometric shape pattern that facilitates the arrangement of the engraved details. This may have been resolved in a design development phase – and possibly sometime ago based on Forlano's prior use of triangular facets – but I would still be interested to know why they are as they are and for what reason appropriate to the concept. What do they suggest aesthetically and how does their sensory qualities impact the aesthetic understanding of the engravings? I understand that for the Endless Quilt it is necessary for the components to be modular and extendable, but I'm not sure that, by itself, this is justification for that feature of their design, as there are other ways to tile 2-dimensional planes.

This is also a question concerning the form and conceptual relations for the bent steel legs in the console. This may be more problematic. While I recognise that bent steel legs are a practical and functional way to support a table and console structure, they also have a strong relationship to 20th century modernist design and industrial fabrication that does not seem entirely appropriate for the concept.

TWO: Scalability of concept

While the concepts of the projects are clearly explained and well grounded in theories of personal attachment, the projects also seem to be framed as an alternative to mass or limited production furniture based on more conventional constraints of function and style. However, the two texts do not address the conventions of such furniture, and perhaps why more conventional furniture specifically fails to achieve personal attachment while it does, or can, achieve other markers for success, such as consumer desirability or market penetration. For example, it could be argued that commercial furniture benefits from mechanised production that may reduce costs and improve quality consistency, to the detriment of personal attachment, but is it enough if bespoke alternatives only improve the personal attachment of their products, but do not compete on price or consistency? Without this discussion it is difficult to know how well the two works perform in response to the extant

PAGE 3 OF 5

For example, as a diagram that not only documents the processes of the system of collection, but also *materialisation*, of familial associations *into form*. This is already suggested by the diagram in the paper. Potentially, there could even be a performative replication in which the 'tools' of the process are given to a different designer/client/family and repeated with different variables.

By which I simply mean to ask: can other people use this project's process to create their own heirlooms for themselves or their friends? To me it seems that this alternative system of production has a laudable environmental imperative, the reduction of waste, that deserves consideration towards a social implementation beyond a single studio practice.

PAGE 5 OF 5

problems of conventional furniture. This is far from being a simple issue, having relation to very problematic aspects of production and consumption economies within capitalism, and perhaps it is discussed further in Forlano's thesis, but in the meantime I would like to put forward the following:

I can imagine that the client-designer co-design process proposed could be developed into a scalable system i.e a set of techniques or instructions, that goes beyond the direct involvement of the designer, as a means to foster non-industrial local production, probably facilitated by distributed robotic production. If so, this system should be made explicit, perhaps, diagrammatically or performatively, and the various possible interactions with the design and manufacturing technologies addressed. In other words, is this a proposal specific to Forlano's immediate practice, family or clients only? To what degree is it translatable or scalable to other practices, families or clients, or other designer/family/client interactions? If Forlano is proposing a scalable system for which these objects are proof of concept, and it seems from the paper "Making custodians; furniture as intergenerational objects" that she may be, then it would be interesting to assess the proposal, and products, of a broader, socially generative system.

PAGE 4 OF 5

Appendix H Copyright permissions

I warrant that I have obtained where necessary, permission from the copyright owners to use any third-party copyright material reproduced in this thesis, or to use any of my own published work in which the copyright is held by another party.

Below are the signed permission statements for the use of images of other copyright holders.

PERMISSION TO USE COPYRIGHT MATERIAL AS SPECIFIED BELOW:

1 image of the *Awakening Lamp by Front Design*.

I hereby give permission for **Penelope Forlano** to include the abovementioned material(s) in his/her higher degree thesis for Curtin University, and to communicate this material via the *espace* institutional repository. This permission is granted on a non-exclusive basis and for an indefinite period. I confirm that I am the copyright owner of the specified material.

Signed: 

Name: Anna Lindgren


Position: Founder and Head of Design

Date: 2017-11-15

PERMISSION TO USE COPYRIGHT MATERIAL AS SPECIFIED BELOW:

4 images showing the changing surface of the *Broken White* product.

I hereby give permission for **Penelope Forlano** to include the abovementioned material(s) in his/her higher degree thesis for Curtin University, and to communicate this material via the *espace* institutional repository. This permission is granted on a non-exclusive basis and for an indefinite period. I confirm that I am the copyright owner of the specified material.

Signed: 

Name: Simon Heijdens

Position: Director

Date: 15/11/17

Photographers' names if available: Simon Heijdens

PERMISSION TO USE COPYRIGHT MATERIAL AS SPECIFIED BELOW:

Image of Trent Jansen's Chinaman's File Rocking Chair.

I hereby give permission for **Penelope Forlano** to include the abovementioned material(s) in his/her higher degree thesis for Curtin University, and to communicate this material via the *espace* institutional repository. This permission is granted on a non-exclusive basis and for an indefinite period. I confirm that I am the copyright owner of the specified material.

Signed: 

Name: Trent Jansen

Position: Designer

Date: 16.11.17

Photographer's name : Scotty Cameron

PERMISSION TO USE COPYRIGHT MATERIAL AS SPECIFIED BELOW:

Image of Patricia Urquiola's Smock Chair.

I hereby give permission for Penelope Forlano to include the abovementioned material(s) in his/her higher degree thesis for Curtin University, and to communicate this material via the *espace* institutional repository. This permission is granted on a non-exclusive basis and for an indefinite period. I confirm that I am the copyright owner of the specified material.

Signed: 

Name: ALESSANDRA MONTELEONE

Position: PRESS OFFICE ASSISTANT

Date: 15/11/2017

Please return signed form to Penelope Forlano, penelope@forlanodesign.com

PERMISSION TO USE COPYRIGHT MATERIAL AS SPECIFIED BELOW:

A web screen shot from the Pamono Website showing results from an 'IKEA' search.

I hereby give permission for **Penelope Forlano** to include the abovementioned material(s) in his/her higher degree thesis for Curtin University, and to communicate this material via the *espace* institutional repository. This permission is granted on a non-exclusive basis and for an indefinite period. I confirm that I am the copyright owner of the specified material.

Signed: 

Name: Danja Prahl

Position: Content Associate

Date: 14.11.2017

4 images from Instagram of; a lamp, one Yolngu weaver, a group of Yolngu weavers and a Koskela team member and a Yolngu weaver.

I hereby give permission for **Penelope Forlano** to include the abovementioned material(s) in his/her higher degree thesis for Curtin University, and to communicate this material via the espace institutional repository. This permission is granted on a non-exclusive basis and for an indefinite period. I confirm that I am the copyright owner of the specified material.

Signed:



Name:

Alexandra Fishburn

Position:

marketing manager

Date:

22/11/17

Photographer's name:

1. *From the Skies*

Where the furniture works are of intimacy and personal nature, this integrated architectural artefact required a connection to a diverse audience, from first time visitors to regular travellers, young and old, male and female, global yet local, visually to non-visually literate. This required a layering of meaning, message and ways of communicating community.

The rear white panelling contains a patterning that merges the cracking dry earth typically of remote WA, and transitioning to a 'star' like pattern at the top representing sky and the idea of plane travel.

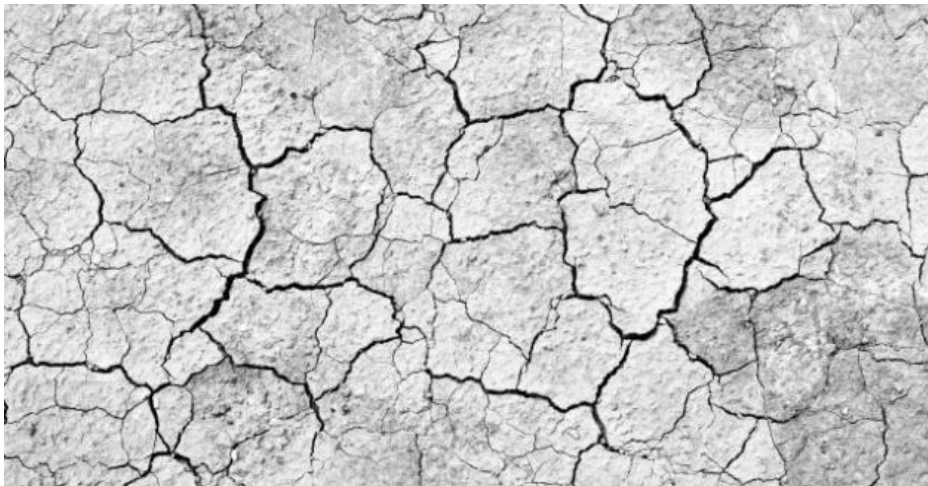


Figure I-1. Yb, Phillip. 'Soil Drought' Stock photo ID: 312820436 (n.d).

Source: Shutterstock. Accessed 08 January 2014, <https://www.shutterstock.com/image-photo/cracked-soil-texture-482864143>

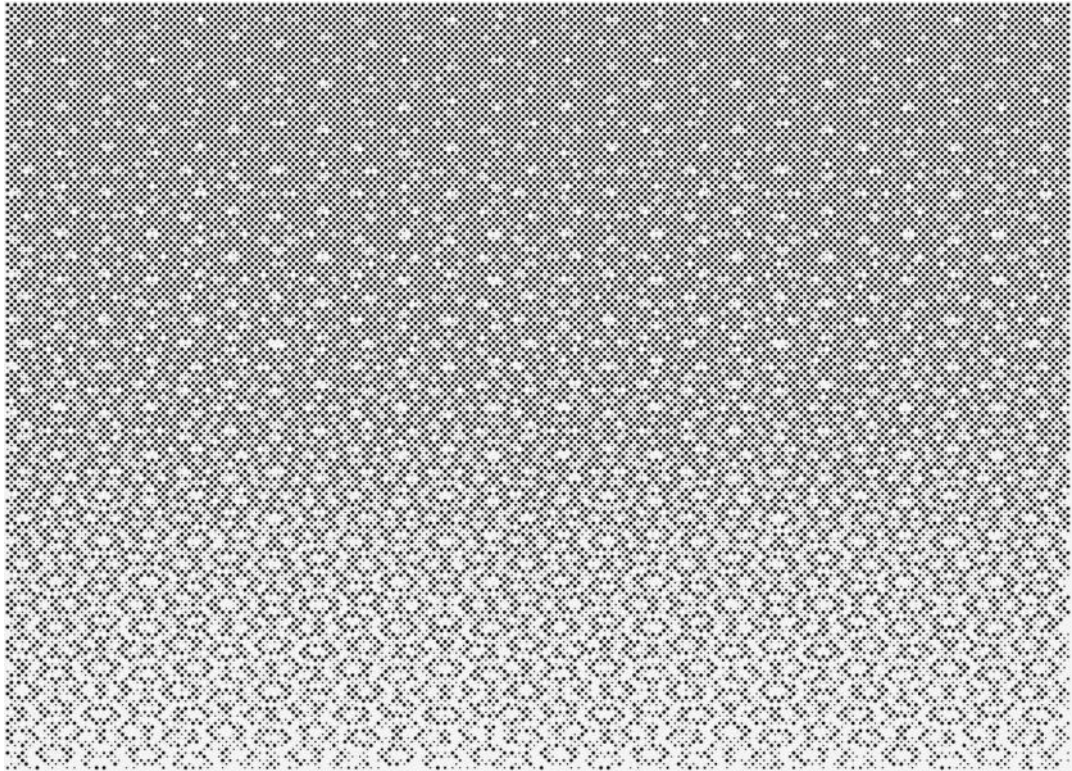


Figure I-2. Forlano, Penelope. Overall perforation patterning for rear wall, 2014.

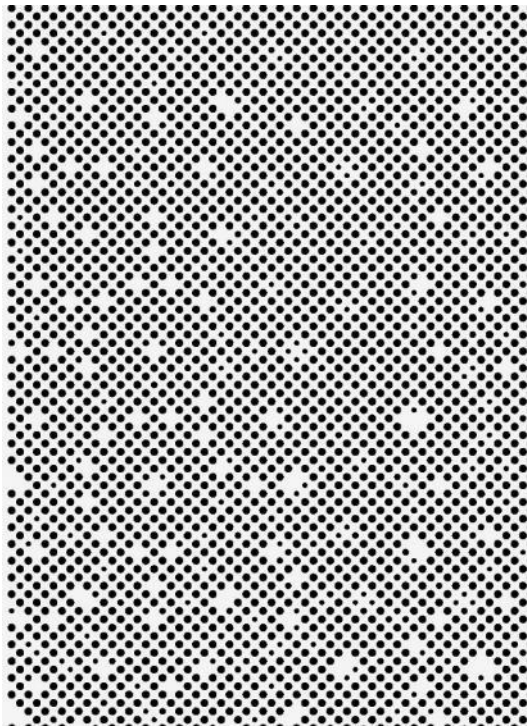


Figure I-3. Forlano, Penelope. Patterning detail near top, 2014.

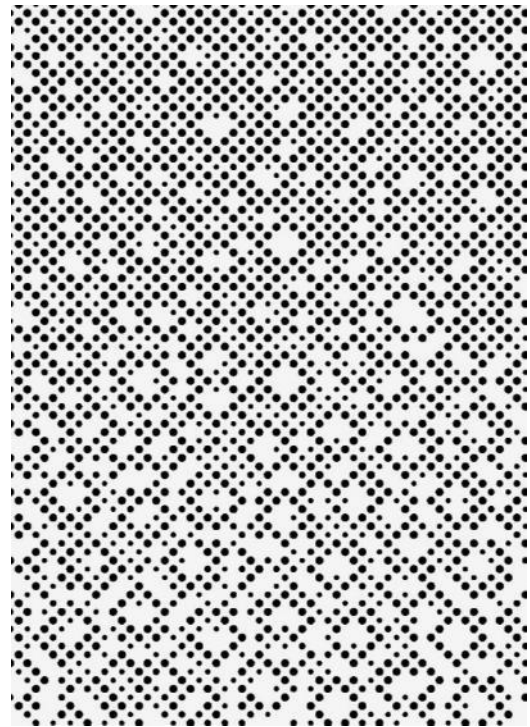


Figure I-4. Forlano, Penelope. Patterning detail near centre, 2014.



Figure I-5. Forlano, Penelope. Patterning detail at base showing text, 2015.

In a digital age of communication, when we can speak to others easily in real time through various media, this idea of physically travelling through the air, and connecting to a place by physically visiting it was a starting point for the idea. Why do people who could otherwise do business, or talk and keep in contact with friends or family digitally, still need to travel? I suspected it was for the intimacy of person to person connection and land-person connection.

Social and place connection became central to the project. The stars, across many cultures and eras, have long been a source of connecting people to place, used as a navigational tool, and provide cultural and spiritual connection through story-telling and mythology.

Most remarkably, the constellation of Orion (Figure 206) and Pleiades (Figure 206) are commonly referred to as 'the hunter or warrior*' and the seven sisters' with remarkably common stories across large expanses of time and cultures, including Australian Aboriginals (Tingay, 2013). It is believed that these stories emerged independently and were not passed on between cultures (Ibid.)

The figure in the left of the artwork represents Orion or *The Hunter* (Western term)/ *The Warrior* (Aboriginal term), and the right is Pleiades.

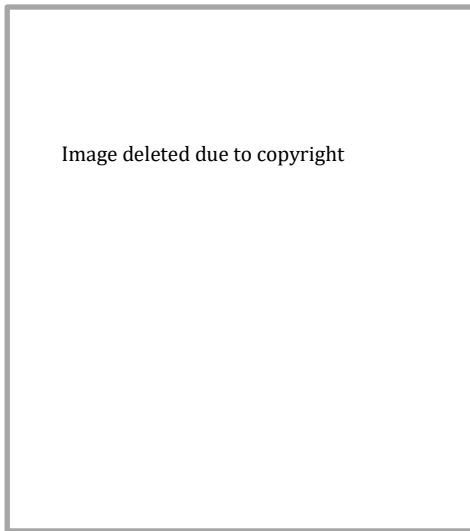


Figure I-6. Department of Astronomy, University of Wisconsin-Madison. Constellation of Orion, n.d

Source: University of Wisconsin- Madison. Accessed 08 November 2017, www.astro.wisc.edu

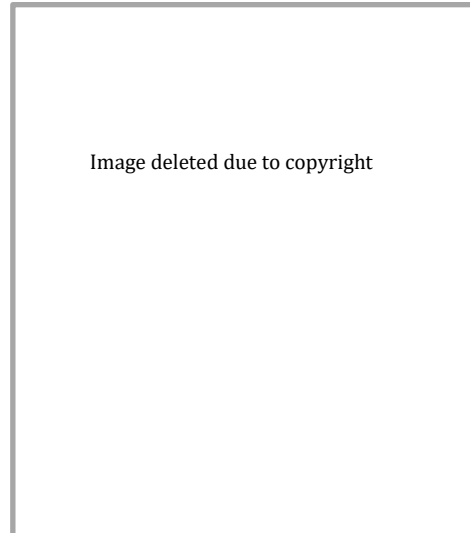


Figure I-7. NASA. A color-composite image of the Pleiades from the Digitized Sky Survey, n.d.

Source: NASA. Accessed 08 January 2014, <http://NASA/ESA/AURA/Caltech/pleiades>.

The artwork also features representations of the unique and now rare fauna. The right sculpture may evoke the native Oblong Turtle's shell through form and the red-tailed black cockatoo/*Karrak* is represented clearly in the perforations. Similarly, the 'hunter' sculpture, the wrapping and scales of a snake, reinforces the crowned snake/*Moyoop*, python and cockatoos in more literal representations through perforations.

This cockatoo again provided the opportunity for multiple interpretations. The bird is the totem of a Whadjuk family of the area, it is believed in Noongar spirituality that the red-tailed black cockatoo protected the spirits of the dead as they ascended into the 'other world' (<http://www.noongarculture.org.au/spirituality/>). This bird once covered the skies in Perth, WA at times as a "black blanket" (ref) over the sky, but is now a rare and protected species, and thus speaks of our environmental challenges and future issues relating to this place. Similarly, the snake has Western versus Aboriginal meanings.



Figure I-8. Forlano, Penelope. *From the Skies (Pleiades detail)*, 2015. Photo by Robert Frith of Acorn. Photography courtesy of FORM and Perth Airport



Figure I-9. Forlano Penelope. Red-tailed black cockatoo photograph, 2014.



Figure I-10. Forlano, Penelope. *From the Skies (Orion detail)*, 2015. Photo by Robert Frith of Acorn. Photography courtesy of FORM and Perth Airport.



Figure I-11. Forlano, Penelope. Carpet Python photograph, 2014.

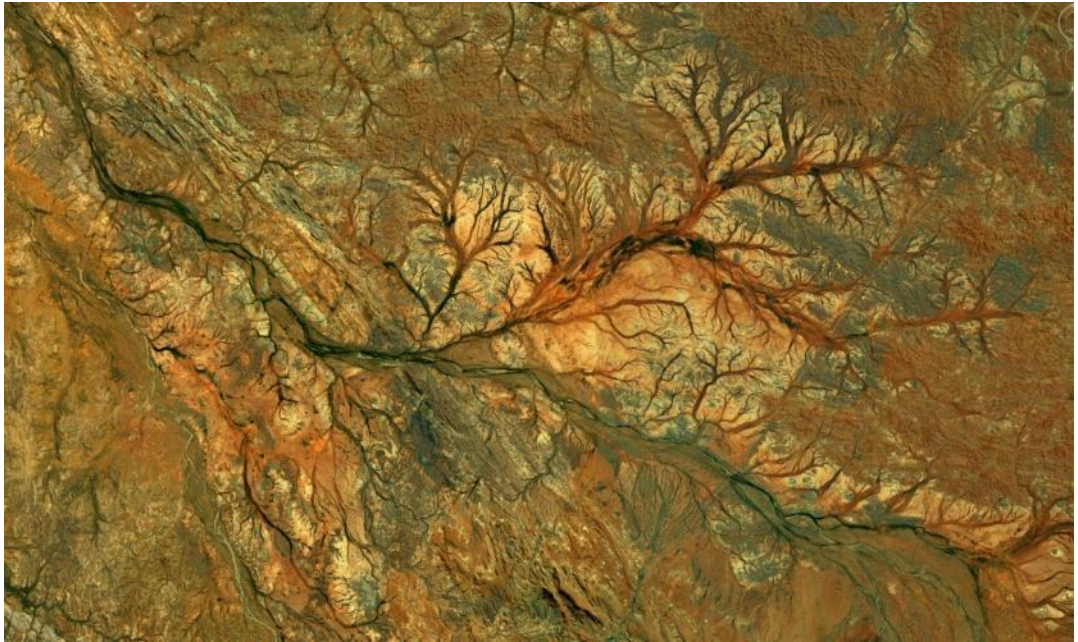


Figure I-12. Google Earth. Exmouth (detail), 2015.

Accessed 08 January 2014. Source: Google Earth.

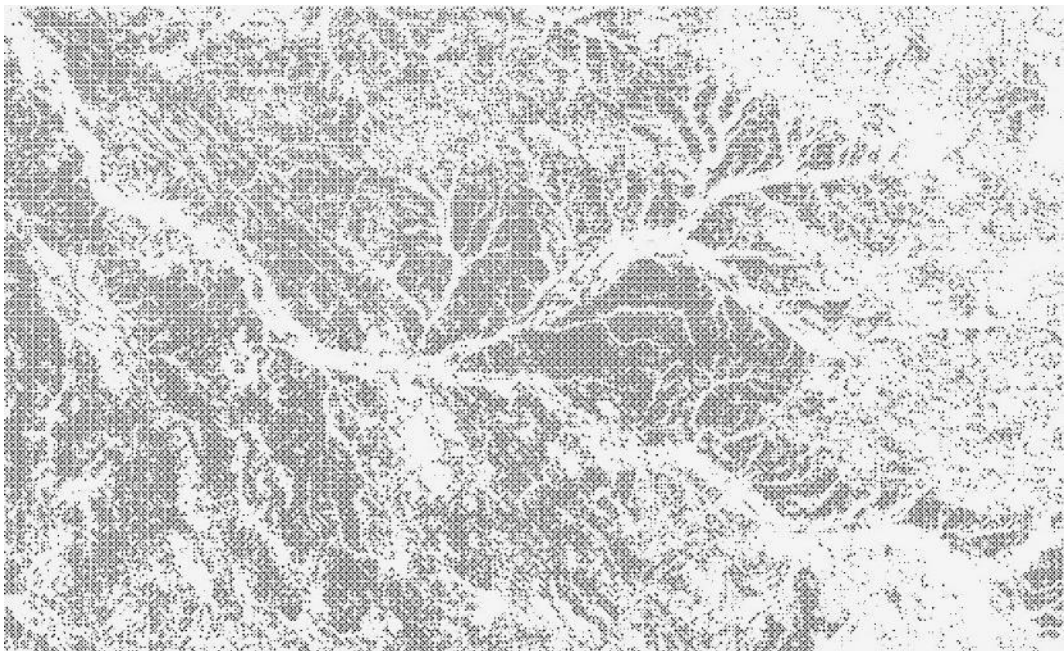


Figure I-13. Forlano, Penelope. Perforation pattern for artwork, 2014.

Additionally, aerial imagery was also used creating meaning for those regularly flying and recognising river formations, or the path of the *Wagul* in Aboriginal spirituality.

My role was not only the integrated design of the artwork and acoustic requirements, but also the preparation of the CAD/CAM shop drawings, the commissioning and overseeing of the fabrication, and liaising with site stakeholders, architects, builders, electricians, structural engineers, fabricators, security and OH+S safety officers to ensure the project was installed on time and budget.



Figure I-14. Forlano, Penelope. Construction of artwork, 2014.



Figure I-15. Forlano, Penelope. Construction of artwork, 2014.

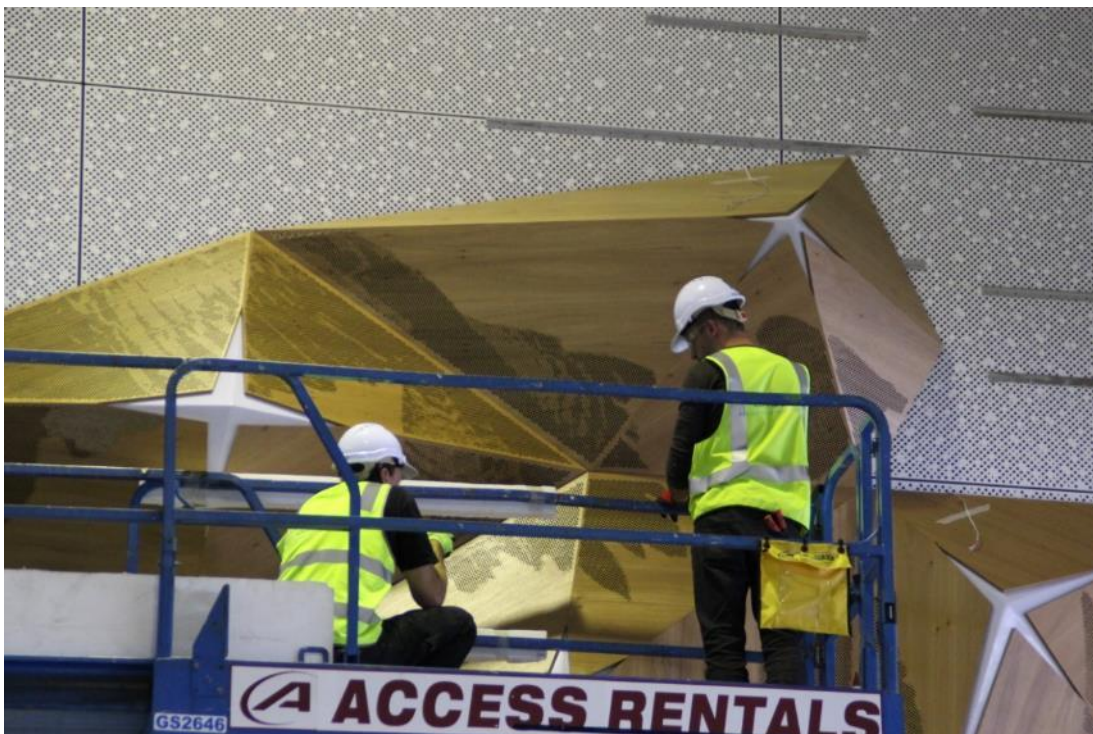


Figure I-16. Forlano, Penelope. Installation of artwork, 2014.



Figure I-17. Forlano, Penelope. Installation of artwork, detail of perforated wall and aluminium hanging system, 2014.

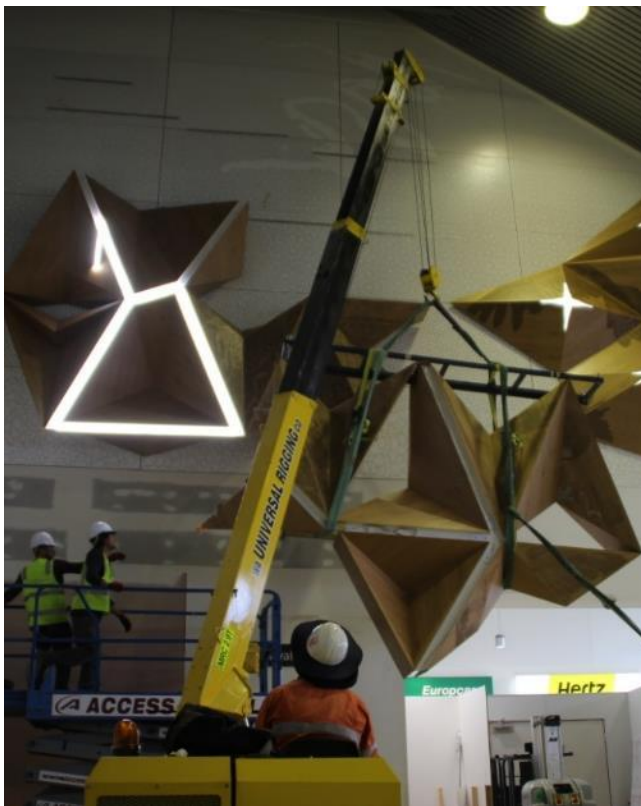


Figure I-18. Forlano, Penelope. Installation of artwork, 2014.

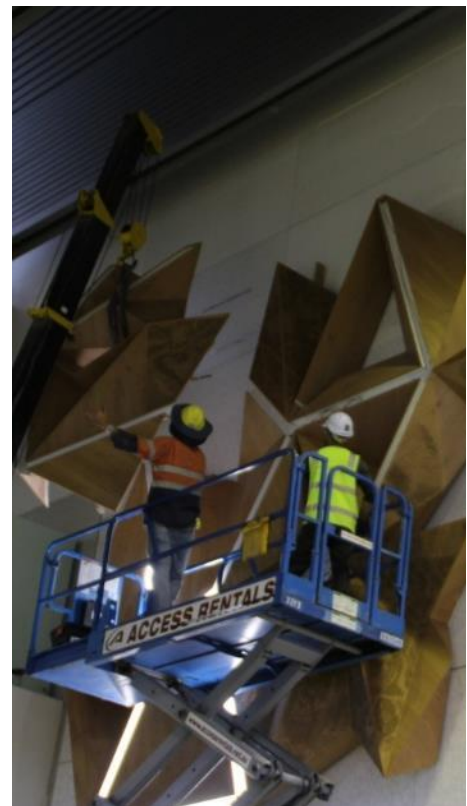


Figure I-19. Forlano, Penelope. Installation of artwork, 2014.

2. *Kaleidoscopic Wave*

This project commissioned by the Department of Education via a competitive tender process; the art consultant was Maggie Baxter, the architects were JCY Architects, and it was completed in July 2017.

Like never before, students are now bombarded with instantaneous and at times fleeting digital information. Their high level of screen time connects them to various social media platforms that allow them to see other places, lives and times in an instant, and this overloaded, disembodied experience can create a disconnection to place. This work aims to reconnect with the time and place with wondrousness and capture the fleetingness of the real and present time.

The link to the maritime past and present are a prime driver for the swelling wave form and the periscope-like opening to the sky above. The soffit abstractly represents looking up from under the ocean, experiencing the ever-changing and fragmented reflections of light and image and a point of light that extends up through the roof space ending with a skylight to the ever-changing sky above. This maritime-inspired form reflects this unique quality of the school's location and teaching.

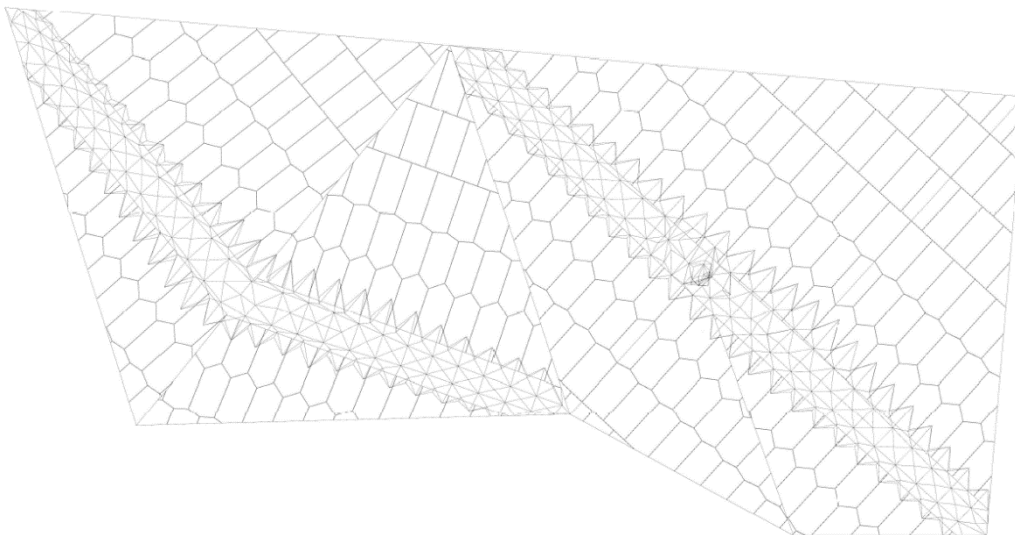


Figure I-20. Forlano, Penelope. Preliminary concept, reflected ceiling plan, 2014.

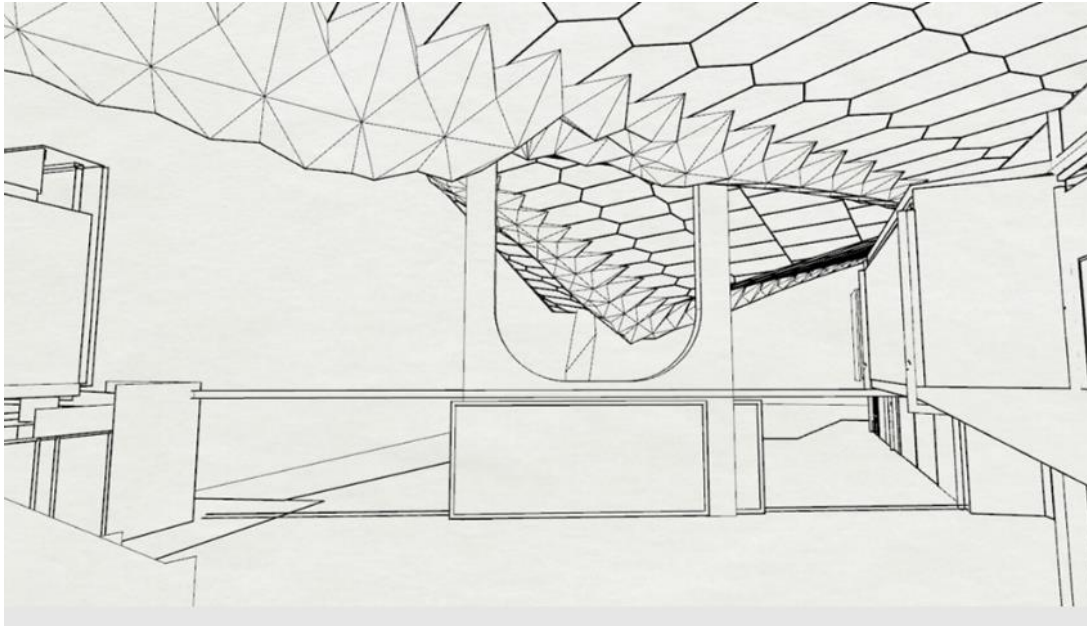


Figure I-21. Forlano, Penelope. Preliminary concept, perspective sketch looking west, 2014.



Figure I-22. Forlano, Penelope. Preliminary concept, perspective sketch looking east, 2014.

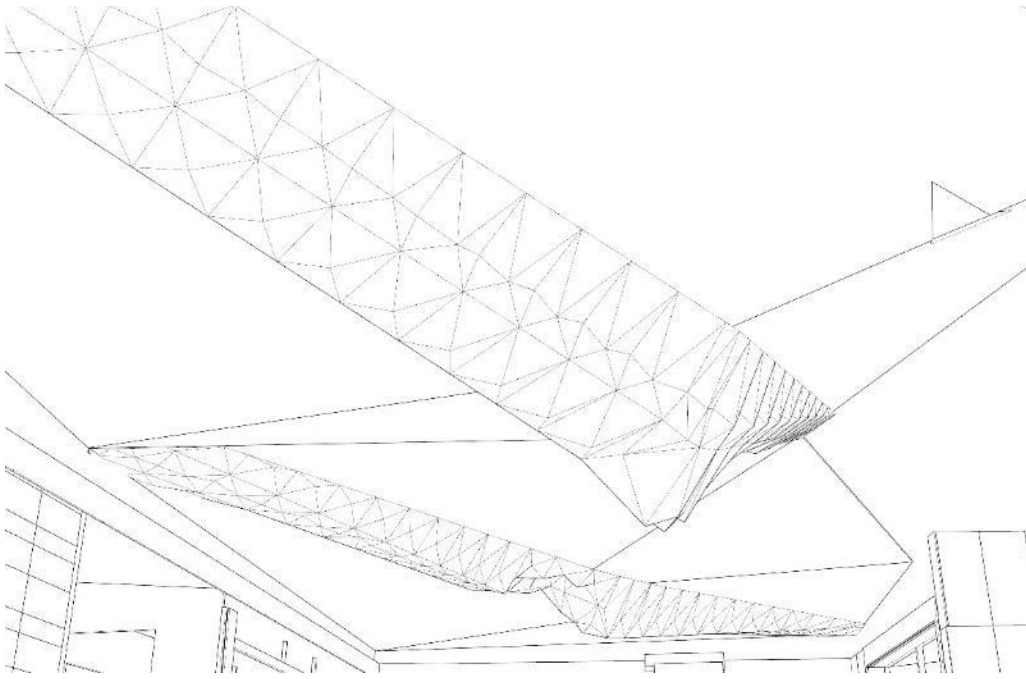


Figure I-23. Forlano, Penelope. Perspective of final design, 2017.

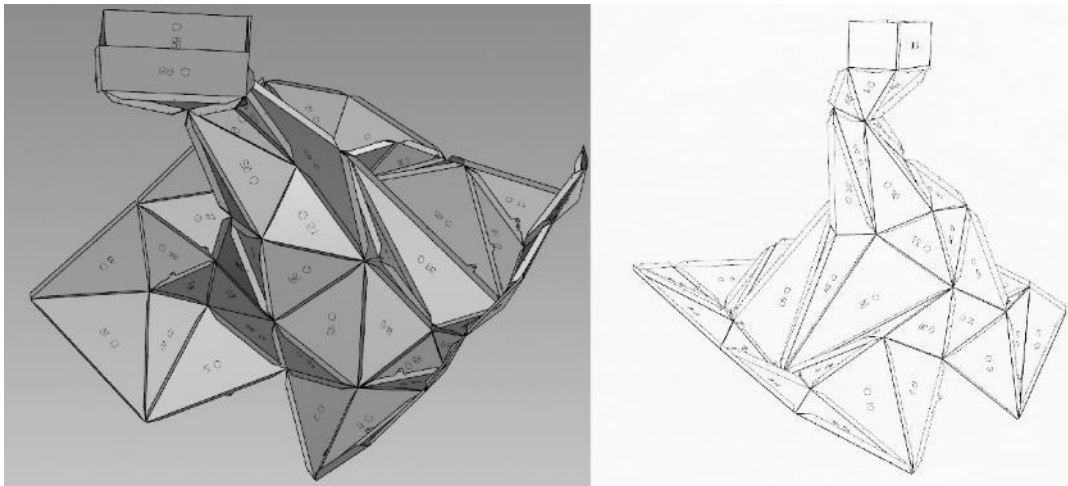


Figure I-24. Forlano, Penelope and Glen Oldfield. Final drawings of 'oculus' component, 2017.

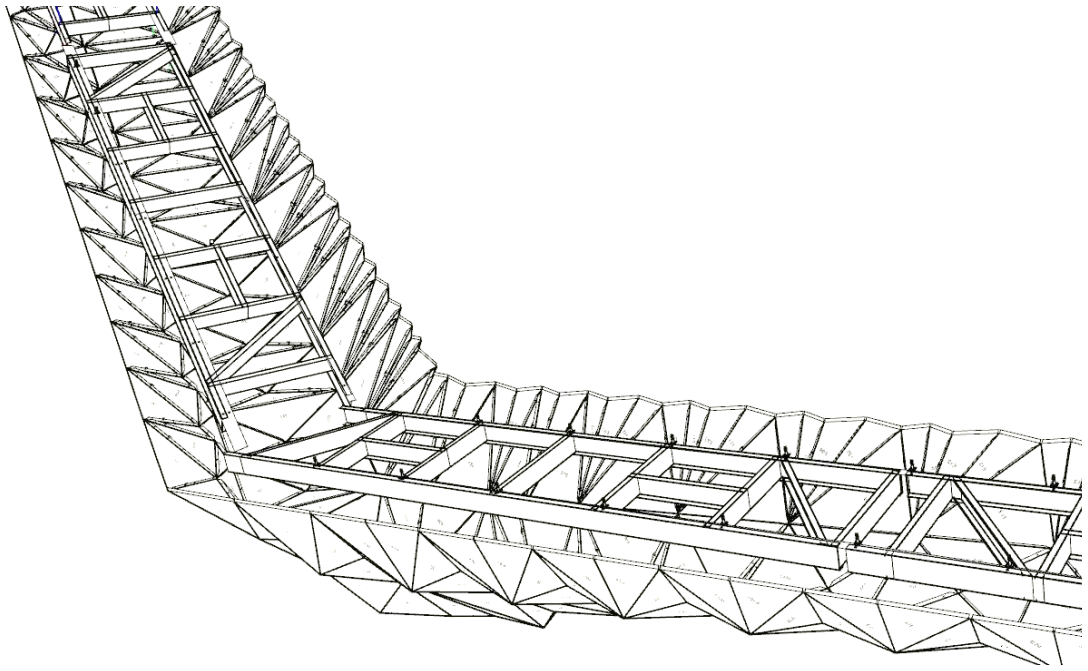


Figure I-25. Forlano, Penelope and Glen Oldfield. Final model, view inside western sculpture, 2017.

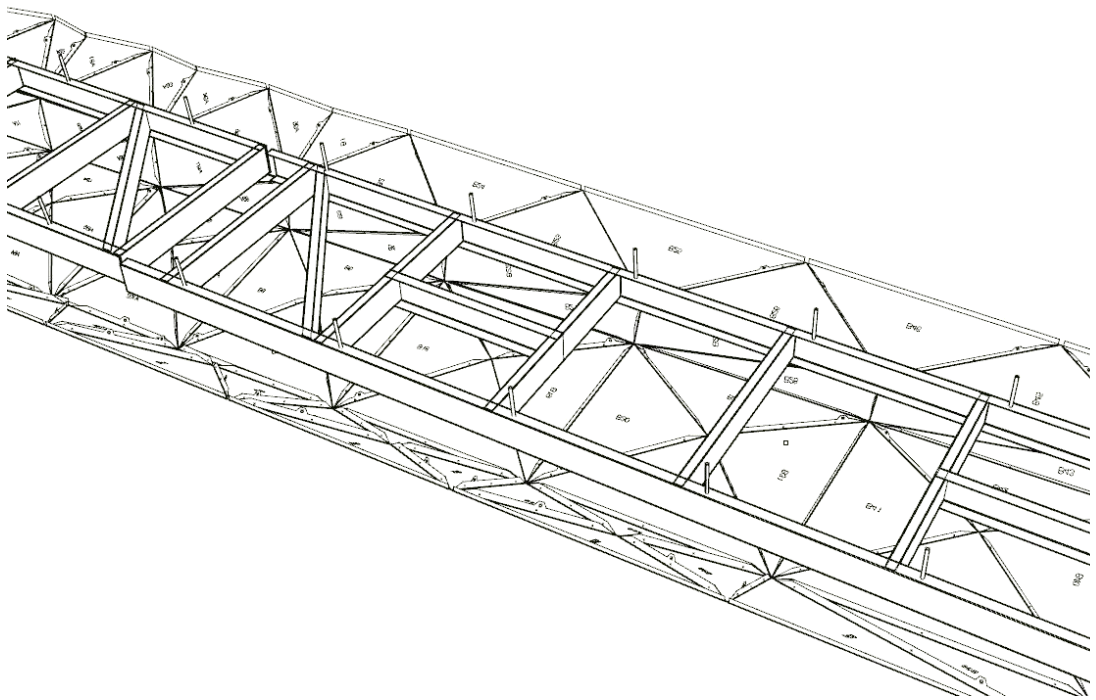


Figure I-26. Forlano, Penelope and Glen Oldfield. Final model, view inside eastern sculpture, 2017.

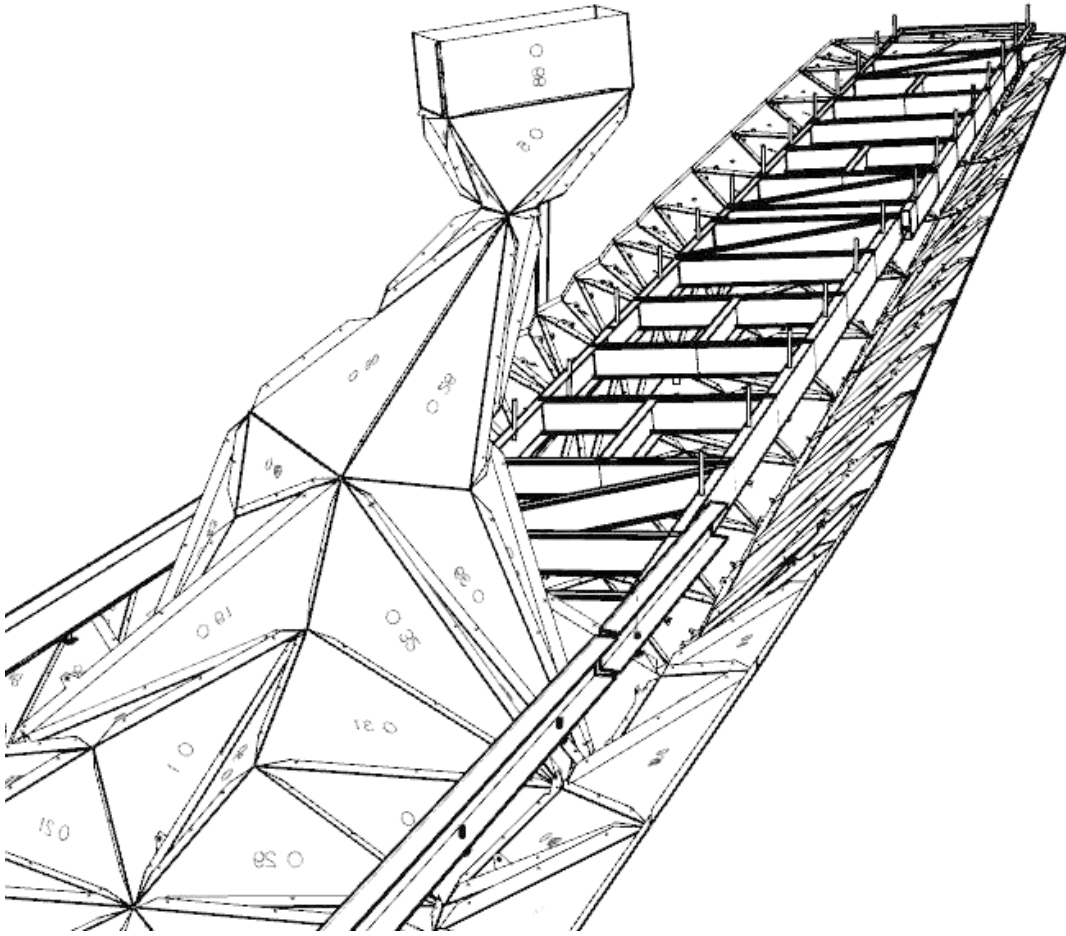


Figure I-27. Forlano, Penelope and Glen Oldfield. Final model, view inside eastern sculpture, 2017.

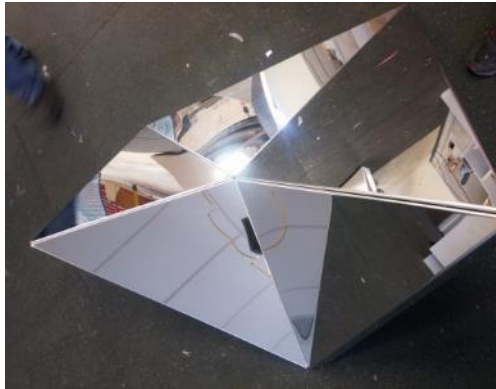


Figure I-28. Forlano, Penelope. Test sample, 2017.



Figure I-29. Forlano, Penelope. Test sample, viewing underside flanges, 2017.



Figure I-30. Forlano, Penelope. *Kaleidoscopic Wave*, component A, opening to skylight, 2017.



Figure I-31. Forlano, Penelope. *Kaleidoscopic Wave*, component A, view into skylight, 2017.



Figure I-32. Forlano, Penelope. *Kaleidoscopic Wave*, component A, delivery to site, 2017.



Figure I-33. Forlano, Penelope. *Kaleidoscopic Wave*, component A, opening to skylight, 2017.



Figure I-34. Forlano, Penelope. *Kaleidoscopic Wave*, component A, installed, 2017.



Figure I-35. Forlano, Penelope. *Kaleidoscopic Wave*, component A, installed, 2017.



Figure I-36. Forlano, Penelope. *Kaleidoscopic Wave*, component B assembled, inside view, 2017.



Figure I-37. Forlano, Penelope. *Kaleidoscopic Wave*, component C assembled, inside view, 2017.



Figure I-38. Forlano, Penelope. *Kaleidoscopic Wave*, component D and E assembled in factory, 2017.



Figure I-39. Forlano, Penelope. *Kaleidoscopic Wave*, component F and G assembled in factory, 2017.

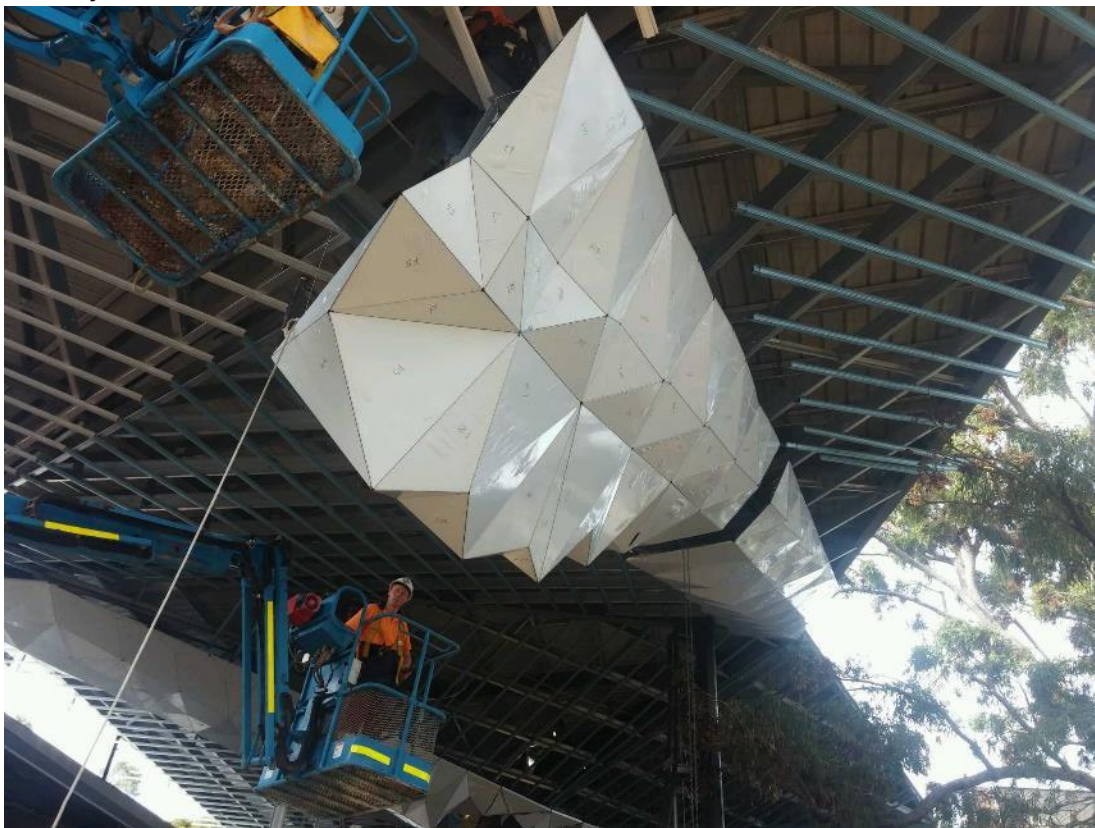


Figure I-40. Forlano, Penelope. *Kaleidoscopic Wave*, component G being installed, component F installed, 2017.



Figure I-41. Forlano, Penelope. *Kaleidoscopic Wave*, component F, being installed, 2017.



Figure I-42. Forlano, Penelope. *Kaleidoscopic Wave*, fully installed, with protective covering still in place, 2017.

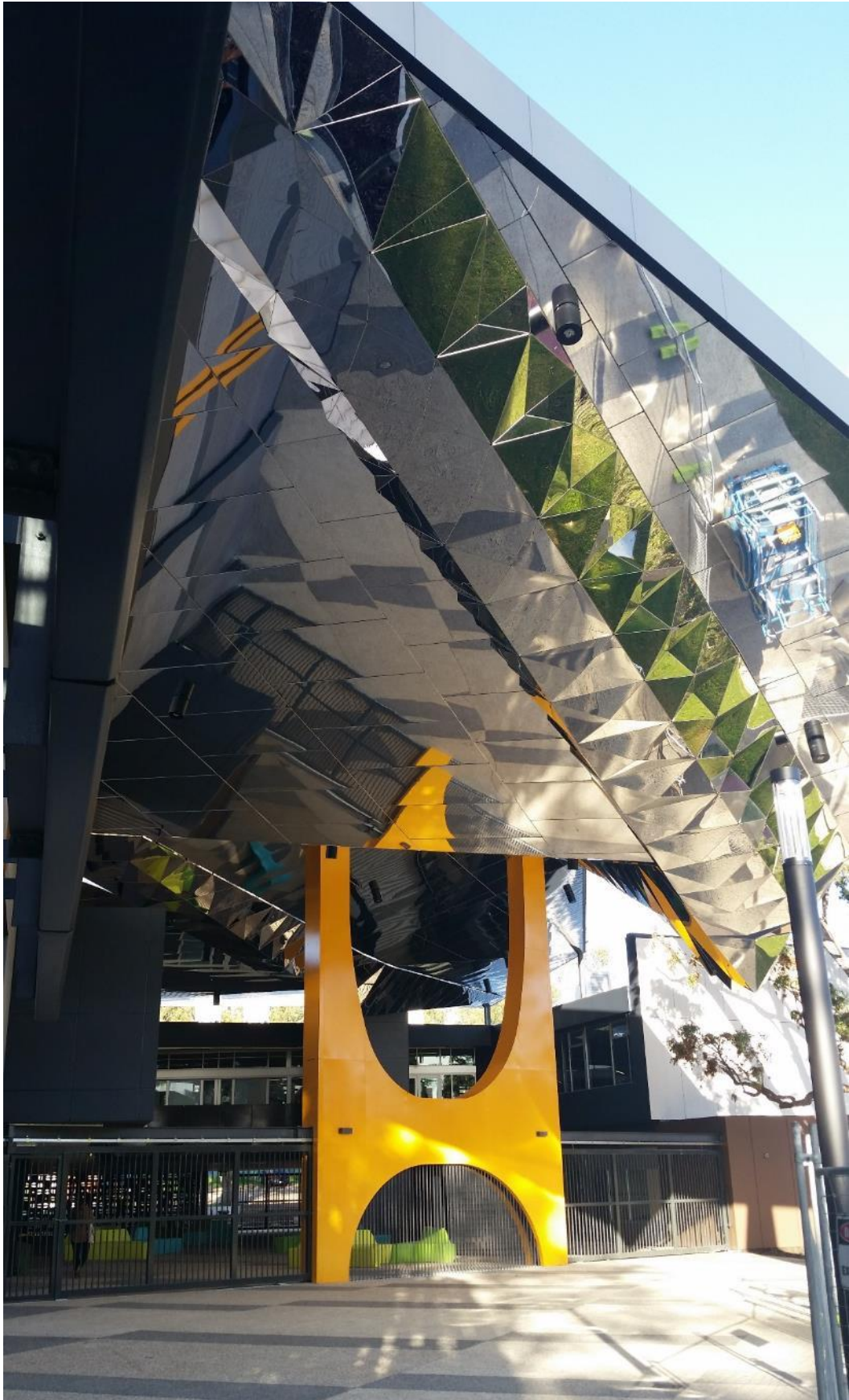


Figure I-43. Forlano, Penelope. *Kaleidoscopic Wave*, completed, 2017. Forlano, 2017.



Figure I-44. Forlano, Penelope. *Kaleidoscopic Wave*, completed, 2017. Forlano, 2017.

3. *Marri-Kingia past*

The following are progress and final images of the *Marri-Kingia Past* series of installations at Byford Secondary College.

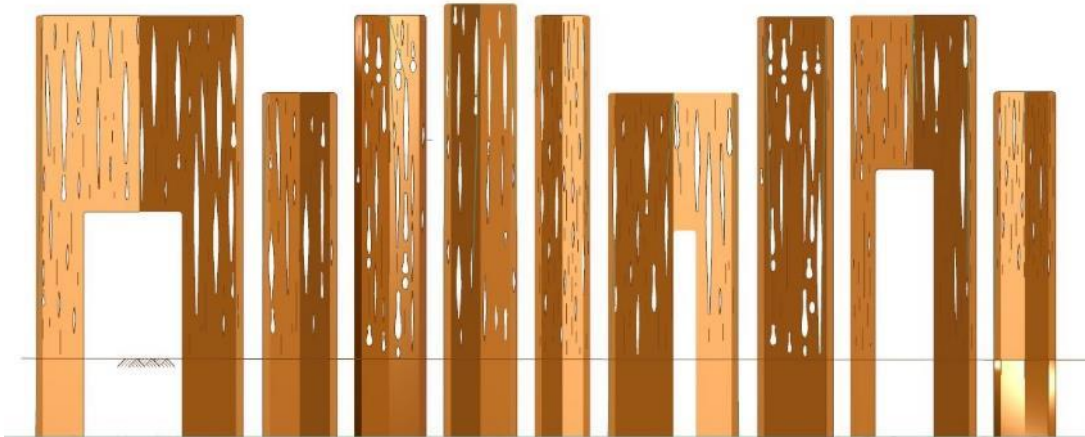


Figure I-45. Forlano, Penelope. Render of proposed Corten screen, 2016.



Figure I-46. Forlano, Penelope. Corten screen in construction, 2017.

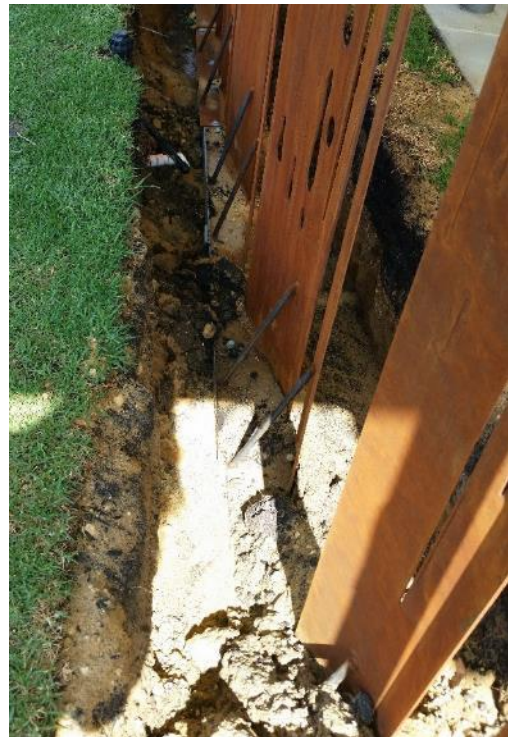


Figure I-47. Forlano, Penelope. Corten screen being installed, 2017.



Figure I-48. Forlano, Penelope. Overall design of *Marri Healing* soffit, 2017.

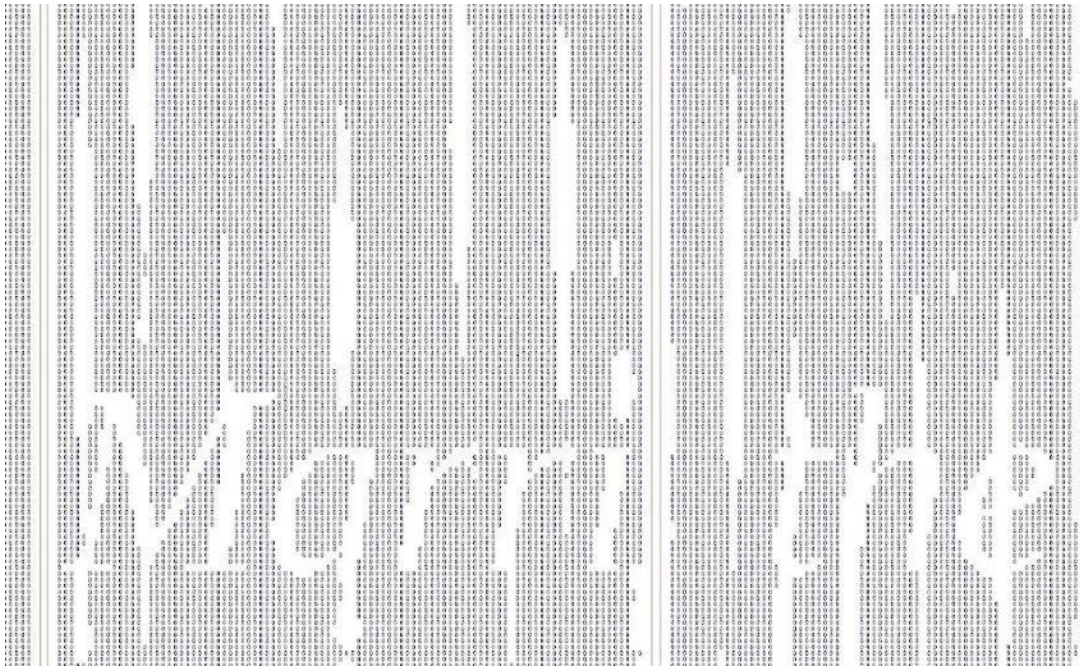


Figure I-49. Forlano, Penelope. Detail of design translated into perforations for *Marri Healing* soffit, 2017.



Figure I-50. Forlano, Penelope. Final installation view of balustrade, photo by Douglas Mark Black, 2017.



Figure I-51. Forlano, Penelope. Final interior view of facade, photo by Douglas Mark Black, 2017.

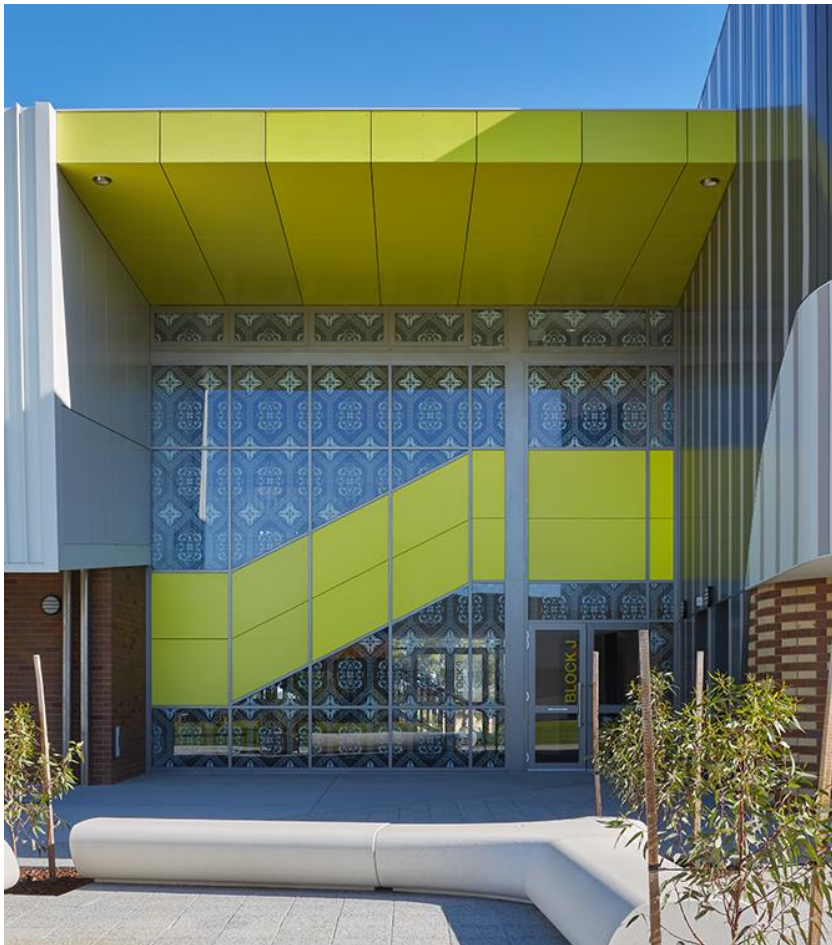


Figure I-52. Forlano, Penelope. Final exterior view of facade, photo by Douglas Mark Black, 2017.

Various fixing methods were explored prior to finalisation of the rope lashing detail for the FNFA. Proprietary *Clamex P-14 Detachable connecting fitting* from *Lamello*, was trialled. The fitting enabled replacement of parts; however, male and female parts limited this flexibility, disassembly was physically difficult, gaps often appeared at the mitred joint, and fittings may in the future become obsolescent. The below images document the abandoned trial.



Figure J-1. Forlano, Penelope. 'Clamex' test, 2017.

Initial testing with lashing proved more promising as tension could be easily achieved by a consumer without specialised skills or tools. A 3mm diameter nylon cord, preferably tightly woven such as that available at hardware or sailing stores (see Figures J-12 and J-13). The detail also allows for colour modification over time if desired, at low cost and easy availability, enabling greater consumer choice and participation.

Further to the discussion in section 6.4, Figures J-1 to J-14 show development and testing of the design, documentation and production process.



Figure J-2. Forlano, Penelope. First lashing test with slots cut with hand-tools, 2017.



Figure J-3. Forlano, Penelope. Alternative cord trial, 2017.

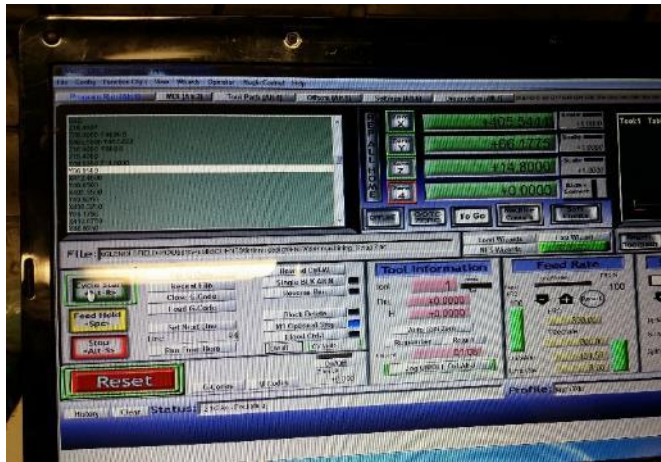


Figure J-4. Forlano, Penelope. 'G Code' for CNC machining of slots, 2017.



Figure J-5. Forlano, Penelope. CNC slot test, 2017.



Figure J-6. Forlano, Penelope. Sealing plywood, 2017.



Figure J-7. Forlano, Penelope. Panels routed and sealed, 2017.

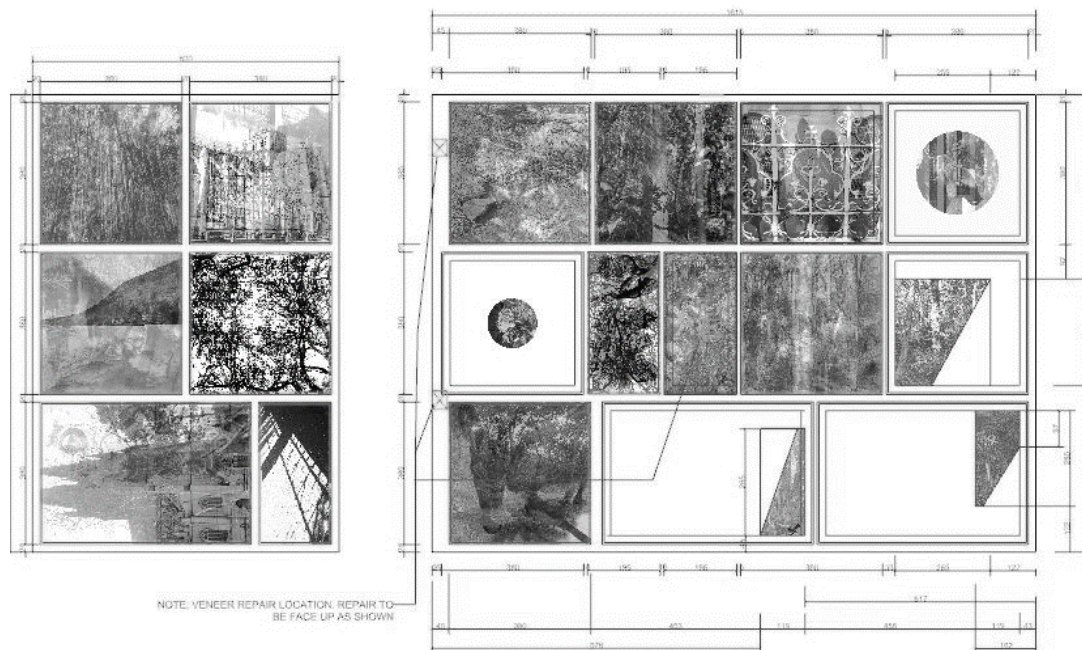


Figure J-8. Forlano, Penelope. Digital printing layout for the *FNFA* project, 2014.



Figure J-9. Forlano, Penelope. Example of drawings for compositions based on interview responses, 2016-2017. *FNFA* project.



Figure J-10. Forlano, Penelope. Example of stain and engraving, 2017.

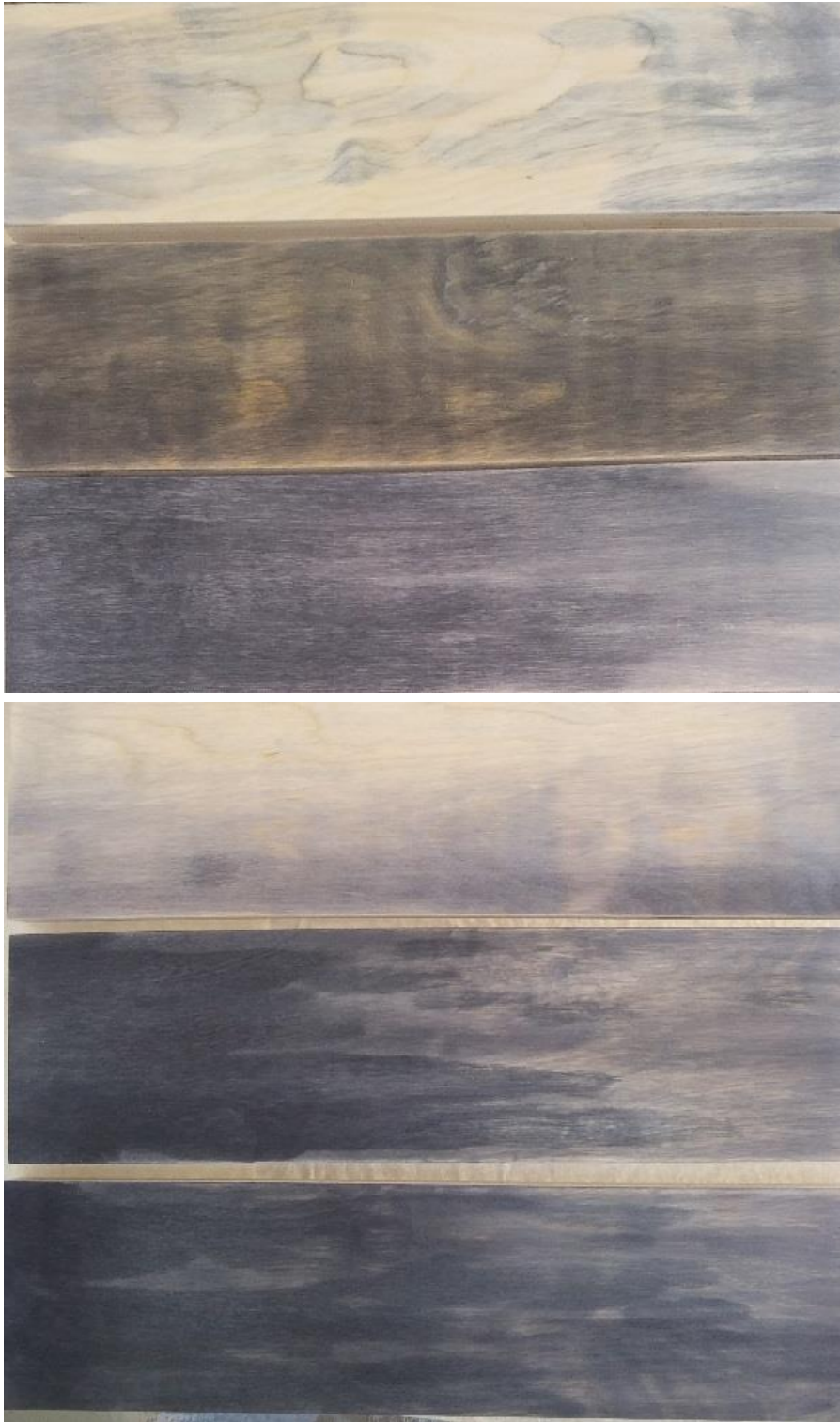


Figure J-11. Forlano, Penelope. Example of applied stain made from Eucalyptus leaf, 2016.



Figure J-12. Forlano, Penelope. Final engraving pattern (for two 370 x 370 panels), 2016-2017.

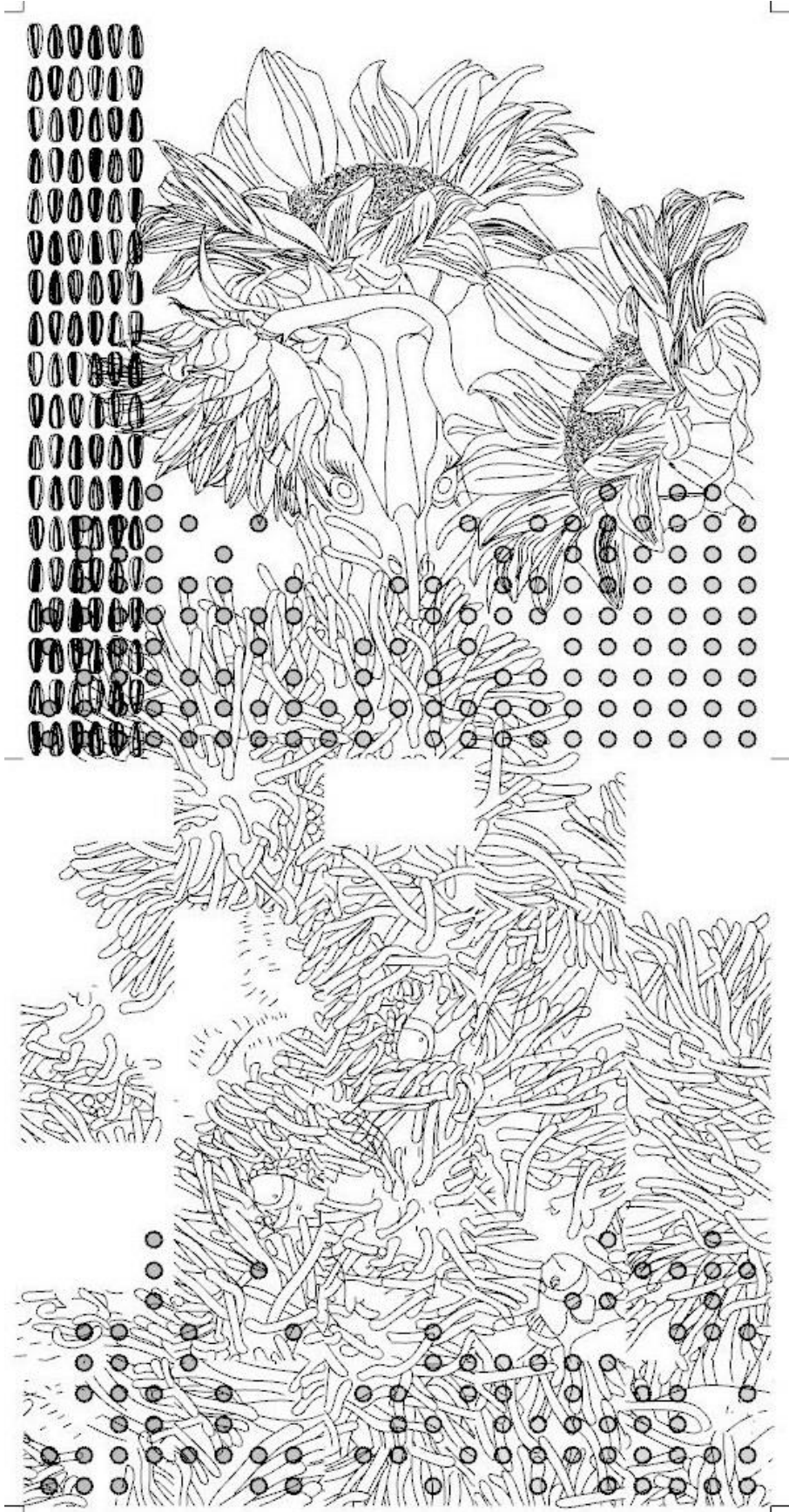


Figure J-13. Forlano, Penelope. Final engraving pattern (for two 370 x 370 panels), 2017.



Figure J-14. Forlano, Penelope. Final lashing tests, 2017.



Figure J-15. Forlano, Penelope. Example configuration, 2017.