THE IMPACT OF PRECARIOUS EMPLOYMENT IN EARLY ADULTHOOD ON AGE AT FIRST CHILDBIRTH:

Development of theoretical, methodological and analytical frameworks from a life course perspective

Emily J. Steele

BAppSc (Physio), MPH

Discipline of Public Health
School of Population Health and Clinical Practice
Faculty of Health Sciences
The University of Adelaide
Australia

Submitted for the degree of Doctor of Philosophy
April 2010

TABLE OF CONTENTS

LIST OF TABLES ..... *vi*

LIST OF FIGURES ..... *vii*

THESIS SUMMARY ..... *ix*

DECLARATION ..... *xi*

AWARDS AND MERITS ARISING FROM THIS THESIS ..... *xii*

CONFERENCE PRESENTATIONS ARISING FROM THIS THESIS ..... *xiii*

INVITED SPEAKER ADDRESSES ARISING FROM THIS THESIS ..... *xiv*

ACKNOWLEDGEMENTS ..... *xv*

ABBREVIATIONS ..... *xvii*

CHAPTER 1 Project rationale *1*

1.1 Introduction **2**

1.2 Australian trends in age at first childbirth **2**

1.3 The significance of older maternal age from a public health perspective **4**

1.4 A preventative approach to older first childbirth **7**

1.5 Casual employment in Australia **12**

1.6 Empirical evidence of the influence of casual contractual arrangements on the timing of first childbirth **15**

1.7 Life course epidemiology **21**

1.8 Research questions and study design **23**

1.9 Thesis objectives **24**

1.10 Overview of thesis **25**

CHAPTER 2 Theory *27*

2.1 Introduction **28**

2.2 Influential perspectives **29**

2.3 Existing frameworks **33**

2.3.1 The Globalife framework 33

2.3.2 The 'theory' of risk aversion 36

2.4 Elaboration of the project framework 38

2.5 The Theory of Life Course Economic Uncertainty and the Timing of First Childbirth 40

2.6 Conceptual models 41

2.7 Delineating constructs, choosing variables 43

2.7.1 Economic uncertainty, employment precariousness: contractual arrangements 44

2.7.2 Other variables 48

2.8 Summary 51

CHAPTER 3 Study design 53

3.1 Introduction 54

3.2 Overview and rationale for event history data 54

3.3 Study design 57

3.4 Retrospective data collection 59

3.5 The Event History Calendar (EHC) 62

3.6 The use of Event History Calendars (EHCs) in telephone interviews 65

3.7 The Lucina cohort 66

3.8 Summary 69

CHAPTER 4 Survey instruments 71

4.1 Introduction 72

4.2 Unit of time 73

4.3 Employment arrangements 74

4.3.1 Defining variables 74

4.3.2 Asking questions 77

4.3.3 Potential sources of misclassification 80

4.4 Post-school study 81

4.5 Live-in relationships 83

4.6 The Life Journeys of Young Women Project Event History Calendar (EHC) 85

4.6.1 Other design features of the Event History Calendar (EHC) 90

4.6.2 Using the Event History Calendar (EHC) 92

4.7 The Life Journeys of Young Women Project Participant Completed Calendar (PCC) **93**

4.8 The Life Journeys of Young Women Project interview schedule **99**

4.9 The final stage of pilot testing **101**

4.10 Summary **103**

CHAPTER 5 Fieldwork ***105***

5.1 Introduction **106**

5.2 Interviewer selection **107**

5.3 Interviewer training **110**

5.4 Quality control **114**

5.5 Interviewer support **118**

5.6 Study participation: general procedures **120**

5.7 Study participation: targetted procedures **124**

5.8 Summary **127**

CHAPTER 6 Methods of analysis ***129***

6.1 Introduction **130**

6.2 Survival analysis **131**

6.3 Analysis variables **135**

6.3.1 Exposure variables 136

6.3.2 Live-in relationships 143

6.3.3 Highest educational attainment 146

6.3.4 Other variables 148

6.4 Approach to analyses **150**

6.5 Summary **151**

CHAPTER 7 Preliminary results ***153***

7.1 Introduction **154**

7.2 Comparison of analysis sample with Lucina cohort **154**

7.3 Description of sample **157**

7.4 Cumulative approach: time-constant analyses **167**

7.5 Sensitive periods approach: time-varying analyses 171

7.6 Summary and discussion 175

CHAPTER 8 Discussion and conclusion 181

8.1 Introduction 182

8.2 Limitations 182

8.3 Implications and contributions 185

8.4 Future work 190

8.5 Conclusion 194

Appendices 195

References 219

LIST OF TABLES

Table 1.1 Percentage of Australian women childless at 30th birthday, by birth year 1951-1971[1] 3
Table 1.2 Obstetric complications by maternal age: adjusted models[11, p. 986] 5
Table 1.3 Summary of British investigation of the impact of employment uncertainty on first childbirth 17
Table 1.4 Life course approaches that commonly underpin epidemiological investigation[58] 22
Table 2.1 Definitions of key concepts pertaining to post-positivist theory building[62] 29
Table 3.1 Select history of cross-sectional retrospective studies that collected event history data 59
Table 4.1 Definitions used for contractual arrangements in the Negotiating the Life Course Project and the Life Journeys of Young Women Project 75
Table 4.2 Definitions of self-employment used by the Australian Bureau of Statistics and for the Life Journeys of Young Women Project 76
Table 4.3 Definitions of unemployed, employed, and not in the labour force used in the Life Journeys of Young Women Project 76
Table 4.4 Issues resulting in clarification notes, and resultant classification 85
Table 6.1 Original and new research questions 135
Table 7.1 Description of analysis sub-group, other cohort members, and the entire Lucina cohort, and results of statistical tests comparing analysis sub-group and others 156
Table 7.2 Description of nulliparous women and mothers according to parents' birthplace, highest level of education and SEIFA index of relative socioeconomic disadvantage. Shown are n (%) 166
Table 7.3 Summary of adjusted hazard ratios for effect of years in employment state on age at first birth minus 1 year, for each level of educational attainment and each employment arrangement, stratified by number of years in relationships and in the labour force 168
Table 7.4 Summary of adjusted hazard ratios for effect of employment state on age at first birth minus 1 year (dichotomised exposure variables), for each employment arrangement and each level of educational attainment, stratified by number of years in relationships and in the labour force 170
Table 7.5 Summary of adjusted hazard ratios for effect of employment arrangements in three year periods on age at first birth minus 1 year, for each employment arrangement and each level of educational attainment, stratified by number of years in relationships 172
Table 7.6 Summary of adjusted hazard ratios for effect of employment arrangements in three year periods on age at first birth minus 1 year (dichotomised exposure variables), for each employment arrangement and each level of educational attainment, stratified by number of years in relationships 174

LIST OF FIGURES

Figure 1.1 The determinants of fertility[7, p. 36] 9
Figure 1.2 Example of older maternal age portrayed by the media in terms of selfish women[32, p. 4-5] 11
Figure 1.3 Percentage of casual employment in Australia (leave entitlement basis), in 1988 and 2001, by sex and age[33, p. 68] 13
Figure 2.1 A framework for investigation of the impact of globalisation and employment systems on the timing of parenthood[49, p. 3] 34
Figure 2.2 Conceptual model of the relationship between economic uncertainty and the timing of first childbirth for middle/high socio-economic status women, according to the cumulative life course approach 42
Figure 2.3 Conceptual model of the relationship between economic uncertainty and the timing of first childbirth for middle/high socio-economic status women, according to the sensitive period life course approach 42
Figure 3.1 Comparison of a marital history in cross-sectional, panel, and event history data formats[137, p. 5 (adapted from)] 56
Figure 3.2 Example of an Event History Calendar[151, Appendix D] 63
Figure 4.1 Abbreviated question sequence for employment arrangements 78
Figure 4.2 Abbreviated question sequence for periods of study 82
Figure 4.3 Question sequence for live-in partnering 84
Figure 4.4 An abbreviated version of the Event History Calendar designed for The Life Journeys of Young Women Project 86
Figure 4.5 Calendar recording system for periods not working, and periods in main jobs 88
Figure 4.6 Calendar recording system for periods of live-in relationships 88
Figure 4.7 Calendar recording system for periods of study 88
Figure 4.8 Abbreviated version of the Participant Completed Calendar for the Life Journeys of Young Women Project 95
Figure 4.9 Example of a cue card used to assist participants to provide question responses in the Life Journeys of Young Women Project 100
Figure 5.1 The checking cycle 116
Figure 5.2 Stages of contact with cohort members, and ideal time interval between stages 121
Figure 5.3 Order that cohort members were approached to participate 125
Figure 6.1 Example periods of observation for Life Journeys of Young Women Project participants 133
Figure 6.2 Example time-constant classification system for working histories[176, p. 170] 136
Figure 6.3 Model of exposure variable 137
Figure 6.4 Example employment arrangement history for one calendar year, as recorded on the Life Journeys of Young Women Project Event History Calendar 139
Figure 6.5 Simplification of database display screen for employment arrangements 140
Figure 6.6 Example employment arrangement history 140

Figure 6.7 Example full-time study history for one calendar year, as recorded on the Life Journeys of Young Women Project Event History Calendar *141*
Figure 6.8 Example full-time study history *141*
Figure 6.9 Example of combined exposure variable *142*
Figure 6.10 Life-in relationship history for one calendar year, as recorded on the Life Journeys of Young Women Project Event History Calendar *144*
Figure 6.11 Simplification of database display screen for live-in partnering *144*
Figure 6.12 Example live-in partnering history *145*
Figure 6.13 Distribution of number of years in live-in relationship(s) over the period of observation, (n=230) *146*
Figure 6.14 Question on high school attainment, wave 1 Lucina interview *147*
Figure 6.15 Question on tertiary educational attainment, wave 1 Lucina interview *147*
Figure 6.16 Questions on parents' country of birth, wave 1 Lucina interview *149*
Figure 6.17 Question on postcode at primary school, wave 1 Lucina interview *149*
Figure 7.1 Distribution of age at first birth minus 1 year (n = 155) *157*
Figure 7.2 Boxplot of time (years) spent in key states of employment arrangement (n = 230) *158*
Figure 7.3 Boxplot of time (years) spent in key states of employment arrangement by educational strata *159*
Figure 7.4 Boxplot of time (years) spent in key states of employment arrangement by parity (nulliparous n = 75, gave birth n = 155) *160*
Figure 7.5 Boxplot of time (years) spent in key states of employment arrangement by parity and educational strata *161*
Figure 7.6 Boxplot of proportion of time spent in key states of employment arrangement, with respect to total time spent in the labour force (n = 230) *162*
Figure 7.7 Boxplot of proportion of time spent in key states of employment arrangement with respect to total time spent in the labour force, by educational strata *163*
Figure 7.8 Boxplot of proportion of time spent in key states of employment arrangement with respect to total time spent in the labour force, by parity (nulliparous: n = 75, gave birth: n = 155) *164*
Figure 7.9 Boxplot of proportion of time spent in key states of employment arrangement with respect to total time spent in the labour force, by parity and education *165*

THESIS SUMMARY

The average age of Australian women at first childbirth in 2006 was 28.2 years, while the proportion of first births among women aged ≥ 35 years increased from 8% in 1997 to 14% in 2006. From a public health perspective, this shift has a raft of health consequences for women and children, including increased risks of miscarriage, gestational diabetes, and birth defects in the child. Furthermore, the use of assisted reproductive technologies associated with older childbearing carries risks in pregnancy, and adverse outcomes in offspring, in addition to very significant financial and emotional costs. Thus, it is imperative to understand barriers to childbearing at 'optimal' ages. Since evidence also suggests women now have fewer children than they would like, it is particularly important to investigate underlying structural determinants of older motherhood and foreshortened reproductive careers. Precarious employment conditions, related to trends in international labour markets, may play an important role in older age of first-time motherhood (as suggested in contemporary fertility theories). However there is a paucity of Australian research about this issue.

A post-positivist approach was used to design a theory incorporating multiple disciplinary perspectives. The theory sought to explain the influence of macro-economic factors on individual lives, and was cognisant of the life course dimension. The ensuing conceptual framework and research questions guided the design of a retrospective cross-sectional study based on a birth cohort (n ~ 1000, born 1973-75) which was established when women were aged ~ 30 years. A detailed event history instrument was developed to obtain data regarding a range of life domains including pregnancy, partnering, education, and employment (sometimes as detailed as monthly intervals). Time-varying and time-constant survival analysis techniques were applied within a life course framework to examine the effects of precarious employment on age at first childbirth (taking into account educational attainment and other influential factors), with a sub-set of the study cohort (n=230).

This project is innovative at a number of levels. For the first time within the public health domain, an argument is presented for the relevance and significance of the contemporary social issue of older age at first childbirth. From an epidemiological perspective, the project offers advances in a number of areas, including theory-building

(particularly in the convergence of life course and hierarchical perspectives) and engagement with a relatively new exposure variable (precarious employment). The project contributes substantially to the sub-discipline of life course epidemiology, in the following ways: (1) collection of fine-grained life course data (event history data as opposed to cross-sectional or successive point-in-time measures); (2) improvement of techniques to collect high quality retrospective data (type of survey instruments and fieldwork procedures); and (3) presentation of a framework for the use of survival analysis techniques to complement life course theories.

This PhD thesis presents and discusses each stage of project development and execution, including theory-building, survey design, fieldwork, and construction of the analysis framework, culminating in a description of preliminary data analyses conducted (n=230) and results obtained. In this thesis the intellectual contributions arise from the combined work on theoretical, methodological and analytical frameworks. They will form the basis of future (postdoctoral) analyses to be conducted with the entire dataset.

Results from this project will contribute to the growing evidence base highlighting detrimental impacts of globalisation and recent changes to labour market institutions on the lives of individuals. Ultimately the study findings may help to shape policy which enables women and their partners to have children (if desired) at a time in the life course which is most conducive to their health and to the health of their children.

DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution to Emily Steele and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

I also give permission for the digital version of my thesis to be made available on the web, via the University's digital repository, the Library catalogue, the Australasian Digital Thesis Program (ADTP) and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

Signed: …….

Emily Jane Steele

Date: …….

AWARDS AND MERITS ARISING FROM THIS THESIS

2009	Early Career Award, Australasian Epidemiological Association: $500. (Declined due to personal circumstances preventing travel).
2007	Mutual Community Postgraduate Travel Grant: $2 500.
2007	University of Adelaide Faculty of Health Sciences Research Committee Postgraduate Travelling Fellowship: $1 000.
2007	Invited participant, the European Consortium for Social Research and the European Science Foundation TransEurope Research Network 5-day summer school, Groningen, The Netherlands (August 27-31 2007).
2007	Student bursary from the European Science Foundation TransEurope Research Network to attend summer school (see previous item): $1 400.
2007	Respondent's Prize, State Population Health Conference (award for best presentation as determined by chairs and expert respondents for presentation sessions).
2005-2009	National Health and Medical Research Council Public Health Postgraduate Research Scholarship: $78 927.

CONFERENCE PRESENTATIONS ARISING FROM THIS THESIS

Steele E, Giles L, Davies M and Moore V. *Neo-liberalism and precarious employment: do they play a role in older first-time motherhood, and for whom? Preliminary results from the Life Journeys of Young Women Project.* (Oral presentation). Australian Women's and Gender Studies Association annual conference 'Emerging Spaces: New Possibilities in Critical Times'. Adelaide, Australia, June 30-July 2, 2010.

Steele E, Giles L, Davies M and Moore V. *Financial insecurity in young adulthood: does this play a role in older first-time motherhood, and for whom?* (Poster presentation). 6th Australian Women's Health Conference. Hobart, Australia, May 18-21, 2010.

Steele E, Moore V and Davies M. *Does financial uncertainty play a role in delayed childbearing: a progress report.* (Oral presentation). State Population Health annual conference 'Public Health Research for the Real World.' Adelaide, Australia, October 18, 2008.

Steele E, Moore V and Davies M. *Does financial uncertainty play a role in delayed childbearing?* (Oral presentation). State Population Health annual conference 'Population Health Impact of Health Services Research.' Adelaide, Australia, October 20, 2007.

Steele EJ, Moore VM and Davies MJ. *The impact of economic uncertainty on the timing of first childbirth: an Australian perspective.* (Oral presentation). European Society for Social Research and the European Science Foundation TransEurope Research Network conference on 'Globalization, Inequality and the Life Course'. Groningen, The Netherlands, September 1-2, 2007.

Steele EJ, Moore VM and Davies MJ. *A novel approach to a much-discussed issue: how do economic factors impact on the timing of first childbirth?* (Oral presentation). Australian Population Association 13th Biannial Conference 'Population, Policy & Australia's Destiny'. Adelaide, Australia, December 5-8, 2006.

INVITED SPEAKER ADDRESSES ARISING FROM THIS THESIS

Statistical Society of Australia and Australasian Epidemiological Association, South Australian chapters. 'Epidemiological and statistical approaches to working with life course data'. In conjunction with Dr Lynne Giles. Adelaide, Australia, planned for August, 2010.

The Life course and Intergenerational Health Research group seminar series, The University of Adelaide. 'The Life Journeys of Young Women Project: a PhD overview'. Adelaide, Australia, June 15, 2010.

The Working Women's Centre. 'The impact of economic uncertainty on delayed childbearing in Australia: a project report' Adelaide, Australia, June 3, 2008.

Invited panel member for session entitled 'Social, Psychological and Behavioural Aspects Behind the Choice to have Children'. Scheduled session was part of the National Population and Family Planning Commission of P.R. China Human Rights and Family Planning Study Visit., sponsored by the Human Rights and Equal Opportunity Commission of Australia, and the China-Australia Human Rights Technical Cooperation Program. Adelaide, Australia, June 3, 2007.

European Society for Social Research and the European Science Foundation TransEurope Research Network Summer School: Globalization, Inequality and the Life Course: Comparative Methodological Approaches. 'The impact of economic uncertainty on delayed childbearing in Australia: a progress report'. Groningen, The Netherlands, August 27-31, 2007.

Healthy Development Adelaide Research Cluster Annual Research Day, The University of Adelaide. 'The role of precarious social circumstances in delayed childbearing.' Adelaide, Australia, May 26, 2006.

Allied Health Department, Women's and Children's Hospital. 'Public health implications of delayed childbearing.' Adelaide, Australia, February 26, 2006.

ACKNOWLEDGEMENTS

I owe a great deal of thanks to many people: those who have assisted directly in the production of this thesis, those who have contributed to the Life Journeys of Young Women Project (LJYWP) in other ways, and those who have shared other parts of this journey with me.

I would like to thank my principal supervisor, A/Prof Vivienne Moore, whose vision, passion, encouragement and support, at every step of my candidature, have been much appreciated. I thank my other supervisors, A/Prof Michael Davies and Prof Philip Ryan, for expert advice given generously, and for their dedication to the pursuit of excellence. My supervisors' collective willingness to 'go beyond', into new territory, has enabled my work to develop in exciting directions. I would also like to thank Vivienne and Michael for the opportunity to work with the Lucina cohort - for the trust implied therein, and for the unique spectrum of experiences that this enabled for my PhD candidature, from project design through to purposeful survey development and large-scale fieldwork management - for which I will always be grateful.

I thank and acknowledge the contributors to the 'GLOBALIFE – Life Courses in the Globalization Process' program, many of whom I met in Groningen (the Netherlands) at the TransEurope Research Network conference and summer school, in 2007, and who happily gave of their time to look at drafts of the LJYWP Event History Calendar and discuss ideas for my project. In a similar vein, thank you also to Dr Wander van der Vaart and Tina Glasner (formerly of VU University Amsterdam, and now at Wageningen University & Research centre, the Netherlands). I also acknowledge Professor Peter McDonald (Director of the Australian Demographic and Social Research Institute, The Australian National University), whose theoretical work was influential in the development of my project.

Thank you to all my research colleagues from the Life course and Intergenerational Health research group at The University of Adelaide, who provided endless amounts of intellectual stimulation and support. I especially thank Dr Lynne Giles, who conducted the analyses presented in this thesis, provided feedback on Chapters 6 and 7, and whose efficiency, pragmatism, and skills I much admire. Thank you to Dr Melissa Whitrow, whose timely advice on quality monitoring of fieldwork processes was sterling. Thanks also to Dr Jennifer Marino, who read a draft of this thesis, and to Dr Alice Rumbold, who proof-read the final draft; both provided valuable feedback that helped me to consolidate ideas more clearly.

Thanks to my dear friend Dr Anna Dawson, for proof-reading the final draft, and for all the shared experiences over our candidatures and beyond.

A collective thank you to the wonderful and talented LJYWP interviewers: Carol Hunter, Hong Le, Nadine Levy, Amelia Russin, Rebecca Short and Tanya Zivkovic. Their dedication to the job, and to supporting each other throughout, was inspirational. As a team their willingness to engage with new interview techniques no doubt led to higher quality data being collected, and the many shared laughs made the fieldwork period enjoyable for those involved. I thank Nanette Kretschmer, the LJYWP Co-ordinator, for her attention to detail, her humour, her support, and her warmth. Thank

you to Kendall Smith, Project Manager of the Lucina Study since its inception, who supported the LJYWP interviewer training period, and was generous in sharing her accumulated knowledge of fieldwork and interview procedures. I also thank Liddy Griffith and Brian McDermott, from the Data Management and Analysis Centre at The University of Adelaide, who designed the LJYWP database and managed the data entry, particularly for their time spent seeking a common language, and willingness to engage with something so different. Thank you to coding, data entry and database design staff: Melanie Ceko, Andrew Holton, Mi-suk Lee, Grace McDermott, Kirsty Modystach, Meredith Morgan, and Scott Wilkinson. Thanks also go to Kaye Robinson, who has done the ANZSCO coding of occupational data for the LJYWP, and to Kristyn Willson, senior statistician at the Data Management and Analysis Centre, for help in accessing wave 1 Lucina data, and supplying information on SEIFA indices relevant to the cohort.

I thank members of the Lucina cohort, who gave their time so generously to take part in the LJYWP, and without whom this work would not have been possible.

I would like to thank my PhD colleagues for intellectual debate, chitchat, fun and friendship, especially Oana, Tessa, Alana, Cathy, Toni and Stephanie; thanks also to lovely friends Penny, Dan, Jeanette, Nadine, Lachie and Jane, and Katie, Bec and Kylie, for their support.

The staff at Chris Jarmer @ Air café, where I sat every morning for six months and wrote much of this thesis, deserve thanks for happily accommodating me in what was a wonderful thinking space, and for their reliable 7:30am grins – always a nice way to start a day of writing.

I thank Adam, whose understanding and kindness throughout my PhD period will always be remembered and appreciated.

Finally, I thank my family, and dedicate this thesis to them - Mum, Dad, Sim, and Ans, and also Nana and Papa. They have supported and encouraged me throughout my candidature, as always. Each, in their own way, has influenced my motivation for undertaking this piece of work. Thank you so much.

ABBREVIATIONS

ABS	Australian Bureau of Statistics
AFBM1	Age at first birth minus one year
ART	Assisted reproductive technologies
C	Casual
CI	Confidence interval
EHC	Event History Calendar
FT	Full-time
FTC	Fixed-term contract
HILDA project	Household, Income and Labour Dynamics of Australia project
IVF	In-vitro fertilisation
LJYWP	Life Journeys of Young Women Project
NILF	Not in the labour force
NLC project	Negotiating the Life Course project
OR	Odds ratio
P	Permanent
PCC	Participant Completed Calendar
PT	Part-time
SE	Self-employed
SEIFA	Socio-Economic Index for Areas
SES	Socio-economic status
UE	Unemployed