

Where Should Babies Come From? Measuring Schemas of Fertility and Family  
Formation Using Novel Theory and Methods

by

Heather M. Rackin

Department of Sociology  
Duke University

Date: \_\_\_\_\_

Approved:

\_\_\_\_\_  
S. Philip Morgan, Co-Supervisor

\_\_\_\_\_  
James Moody, Co-Supervisor

\_\_\_\_\_  
Christina Gibson-Davis

\_\_\_\_\_  
Linda K. George

Dissertation submitted in partial fulfillment of  
the requirements for the degree of Doctor  
of Philosophy in the Department of  
Sociology in the Graduate School  
of Duke University

2013

ABSTRACT

Where Should Babies Come From? Measuring Schemas of Fertility and Family  
Formation Using Novel Theory and Methods

by

Heather M. Rackin

Department of Sociology  
Duke University

Date: \_\_\_\_\_

Approved:

\_\_\_\_\_  
S. Philip Morgan, Co-Supervisor

\_\_\_\_\_  
James Moody, Co-Supervisor

\_\_\_\_\_  
Christina Gibson-Davis

\_\_\_\_\_  
Linda K. George

An abstract of a dissertation submitted in partial  
fulfillment of the requirements for the degree  
of Doctor of Philosophy in the Department of  
Sociology in the Graduate School of  
Duke University

2013

Copyright by  
Heather M. Rackin  
2013

## **Abstract**

Current theories of marriage and family formation behavior tend to rely on the assumption that people can and do consciously plan both fertility and marriage and post-hoc intentions should align with a priori reasons for action (Fishbein & Azjen 2010). However, research shows this is not always the case and researchers have labeled inconsistencies between pre- and post- reports of intentions and behavior as retrospective bias. Researchers such as Bongaarts (1990) have tried to create models that minimize this “bias”.

The Theory of Conjunctural Action is a new model that can explain, rather than explain away, this “bias” (Johnson-Hanks et al. 2011; Morgan and Bachrach 2011). This new theoretical innovation uses insights about the workings of the mind to gain a greater understanding of how individuals report family formation decisions and how and why they might change over time. In this theory, individuals experience conjunctures (or social context which exists in the material world) and use cognitive schemas (or frames within the mind through which individuals use to interpret the world around them). These schemas are multiple and the set can change over time as individuals incorporate new experiences into them.

In this dissertation, I explore how and why pre- and post- reports of intentions may be different using insights from the Theory of Conjunctural Action. In the second chapter, using data from the NLSY79 and log-linear models, I show that there are

considerable inconsistencies between prospective and retrospective reports of fertility intentions. Specifically, nearly 6% of births (346 out of 6022) are retrospectively reported as unwanted at the time of conception by women who prospectively reported they wanted more children one or two years prior to the birth. Similarly, over 400 births are retrospectively reported as wanted by women who intended to have no more births one or two years prior (i.e., in the prior survey wave). The innovation here is to see this inconsistency, not as an error in reporting, but as different construals of a seemingly similar question. In other words, women may not be consciously intending births and then enacting these intentions; rather women may have different schemas (or meanings) of prospective and retrospective measures of fertility intentions.

The next chapter uses this same data to test if women use different schemas to guide their reporting of prospective and retrospective fertility intentions. Again, using insights from the Theory of Conjunctural Action, I expect that different schemas (represented by different sets of variables) predict prospective and retrospective wantedness differentially. I show that retrospective reports of wantedness are guided more by age, marital status, education, job satisfaction, and educational enrollment at birth, while prospective wantedness was guided more by number of children desired and how many children they currently have. I show four logistic models predicting wanted versus unwanted births. I then compared the model fit of logistic models predicting prospective wanted versus unwanted births using the hypothesized

prospective and retrospective schema variables and I did the same for the models of retrospective wantedness. I find that when women report retrospective wantedness, they are guided more by the hypothesized variables.

Finally, in the last empirical paper, because schemas are difficult to measure, I build a methodology, Network Text Analysis, to measure schemas and to understand the schemas surrounding marriage and fertility for low-income Blacks who have not yet had children. I use interview data from the Becoming Parents and Partners Study (BPP), a sample of young, unmarried, childless adults with low incomes. I use these data to explore schemas of childbearing and marriage. Contrary to previous findings that low-income parents do not link marriage and fertility and have different requirements for marriage and fertility, I find that marriage and childbearing are indeed linked and have similar requirements for low-income Blacks prior to childbearing. Low income Blacks hold quite traditional views about the role of marriage and its sequencing vis-à-vis fertility. I argue that the material constraints to marital childbearing may lead to non-marital births and thus respondents sever schemas connecting marriage and childbearing and adopt other schemas of childbearing to provide ad hoc justifications for their behavior.

## **Dedication**

To everyone that has helped me on this journey. Thank you.

# Contents

Abstract .....	iv
List of Tables .....	x
List of Figures .....	xii
Acknowledgements .....	xiii
1. Introduction .....	1
2. Correspondence Between Retrospective and Prospective Fertility Intentions .....	5
2.1 Introduction.....	5
2.2 Data.....	13
2.3 Results .....	18
2.4 Discussion and Conclusion.....	33
3. Meaning of Prospective and Retrospective Fertility Intentions .....	38
3.1 Introduction.....	38
3.2 Background .....	40
3.3 Data and Methods .....	47
3.4 Results .....	55
3.5 Discussion.....	67
4. Schemas of Marriage and Fertility Using Network Text Analysis .....	73
4.1 Introduction.....	73
4.2 Background .....	76
4.3.Data and Methods .....	82
4.3.1. Data .....	82



4.3.2. Methods of Interviewing and Recruiting.....	83
4.3.3. Network Text Analysis.....	84
4.3.4. Analysis Procedures.....	87
4.4. Results.....	92
4.4.1. Network Text Analysis.....	92
4.4.2. Qualitative Sub-Analysis.....	109
4.5. Discussion.....	115
5. Conclusion.....	122
Appendix A. Including Other Variables as Schema Variables.....	126
Appendix B. Model Fit for Prospective and Retrospective Wantedness Using Prospective, Retrospective, and Retrospective time t-1 Schemas.....	134
Appendix C. Predicting Inconsistency with Retrospective and Prospective Schema Variables.....	136
Appendix D. Testing if Current Martial Status is more important than Change in Martial Status.....	140
Appendix E. Logistic Regressions Predicting Prospective and Retrospective Wantedness Using All Schema Variables.....	143
References.....	147
Biography.....	151

## List of Tables

Table 1. Hypothetical Lifelines Showing Fertility Intentions for Women in the NLSY....	17
Table 2. Wanted and Unwanted Births by Two Methods: NLSY79 .....	18
Table 3. Selected Models Fit to Data in Table 2 .....	20
Table 4. Preferred Parameterization of the Association in Table 2 .....	20
Table 5. Wanted and Unwanted Births by Parity: NLSY79 .....	25
Table 6. Preferred Parameterization of the Association in Table 5 .....	26
Table 7. Fertility Intention Patterns of Women: NLSY79 .....	27
Table 8. Wanted and Unwanted Births by Intention Pattern: NLSY79 .....	28
Table 9. Preferred Parameterization of the Association in Table 8 .....	28
Table 10. Wanted and Unwanted Births by Parity and Intention Pattern: NLSY79.....	30
Table 11. Preferred Parameterization of the Association in Table 10 .....	31
Table 12. Hypothetical Lifeline Showing Fertility and Intent for Women in the NLSY ...	51
Table 13. Descriptive Statistics by Prospective and Retrospective Wantedness.....	57
Table 14. Prospective verses Retrospective Wantedness.....	59
Table 15. Model Fit for Prospective and Retrospective Wantedness Using Prospective and Retrospective Schemas .....	62
Table 16. Logistic Regressions Predicting Prospective and Retrospective Wantedness Using Schema Variables.....	64
Table 17. Number of Paragraphs with Marriage and Child .....	93
Table 18. Logistic Regressions Predicting Prospective Wantedness Using Schema Variables & Adding in Other Variables.....	128
Table 19. Logistic Regressions Predicting Retrospective Wantedness Using Schema Variables & Adding in Other Variables.....	131

Table 20. Model Fit for Prospective and Retrospective Wantedness Using Prospective, Retrospective, and Retrospective time t-1 Schemas .....	134
Table 21. Multinomial Logistic Regressions Predicting Consistency Between Prospective and Retrospective Wantedness Using Schema Variables .....	137
Table 22. Model Fit for Predicting Consistency Between Prospective and Retrospective Wantedness Using Change in Marital Status.....	142
Table 23. Logistic Regressions Predicting Prospective and Retrospective Wantedness Using All Schema Variables .....	144

## List of Figures

Figure 1. Percent Prospectively Wanted of Retrospectively Unwanted by Parity .....	22
Figure 2. Child Term Network.....	95
Figure 3. Marriage Schema From Child Term Network .....	97
Figure 4. Money Schema From Child Term Network .....	98
Figure 5. Emotion Schema From Child Term Network.....	100
Figure 6. Marriage Term Network .....	103
Figure 7. Venn Diagram Showing Overlap of Child and Marriage Term Network .....	105
Figure 8. Venn Diagram Showing Overlap Between Marriage Term Network and Marriage Schema from Child Term Network.....	107

## Acknowledgements

Thank you to my committee and all the people who have read this or been forced to hear me talk (and/or rant) about this project. Thank you all those that helped me through this complex and many times bewildering processes.

There are several people I would like to thank individually. S. Philip Morgan has taught me how to be a great scholar and mentor. Thanks to Jim Moody who tirelessly met with me and helped me learn and build Network Text Analysis; also, thank you for always helping me to see the bright side and the joy in research. To Christina Gibson-Davis, for being there for me, tirelessly trying to teach me your amazing writing skills, and being such a wonderful collaborator and mentor. Linda George has always treated me like family and sparked my interest in sociology and demography to an immeasurable extent. Also, a special thanks goes to Chris Bachrach and S. Philip Morgan for igniting an interest in bringing culture and demography together.

Also, thank you to my friends and family. Melanie Sereny Brasher has always been there for me. Thank you to Cyrus Schleifer, Achim Edelman, Amie Bostic, Paige Borelli, folks at UNC, and many more. Finally, thank you Todd Roberts for being so supportive and loving.

# 1. Introduction

My research focuses on an institution that profoundly shapes society—the family. Family formation behaviors shape both the size and composition of the population through fertility behavior. Family formation and fertility decisions not only shape the population, but also have profound implications for individuals within society. My work focuses on fertility, specifically the intendedness of births.

Retrospectively unwanted births have been shown to have negative consequences for mothers, children, and even siblings (Barber & East 2011; for reviews see, Brown & Eisenberg 1995 and Logan et al. 2007). Also, non-marital childbearing has many negative consequences for the children involved. However, researchers know little about the processes that underlie how individuals report fertility intentions or make decisions about marriage.

The Theory of Planned Behavior (TPB) (Fishbein & Ajzen 2010) has guided much of the previous research on fertility and family formation; however, this theory's basic assumptions may not accurately model the complex cognitive and social processes underlying fertility and family formation. In the Theory of Planned Behavior, the distal determinants of intentions (attitudes, perceived norms, and perceived behavioral control) lead to an intention and this intention is the most proximate determinant of behavior. While the theory allows for a mismatch between intended and actual behavior (due to a person's actual inability to control fertility or family formation), individuals

consciously plan, enact these plans, and have clear and measurable intentions that are theorized to be similar either before or after an event has occurred.

However, the Theory of Planned Behavior obscures the complex and heterogeneous cognitive processes that operate when individuals report fertility and family formation intentions. In a 2011 paper, Morgan and Bachrach ponder how researchers can apply a model of planned behavior when about half of all pregnancies in the United States are unintended. Morgan and Bachrach (2011) suggest instead understanding fertility and family formation using the Theory of Conjunctural Action (TCA)--a novel theoretical paradigm that incorporates recent social theory (such as practice theory) and models of the mind.

In the Theory of Conjunctural Action, all behavior including answering survey questions, fertility, and family formation, occurs through interactions between schemas (or frames within the mind through which humans view and interpret the world) and conjunctures (or social context). In this theory, individuals experience an external situation (conjuncture) that is then interpreted through schemas. This allows individuals to cognitively determine what is happening and how to respond (Johnson-Hanks et al. 2011; Morgan and Bachrach 2011).

Importantly, this new theory allows schemas to change over time. In fact, schemas and conjunctures drive fertility and family formation behavior in a recursive process (Sewell 1992, Johnson-Hanks, Bachrach et al. 2010). More concretely, individuals

experience conjunctures (material/social contexts they are exposed to in the world) and then use their schemas to interpret these conjunctures, which then leads to behavior, but this behavior may lead to new and/or unexpected conjunctures, that may change schemas. These new schemas may then give the individual a new interpretation of prior and current events and then these new schemas will then be used to understand past behavior and motivate future behavior. For example, a single mother may have had a schema of childbearing within a marital union, but after an unexpected non-marital pregnancy and a promise of love and commitment without marriage from her partner, she may modify her schemas of marriage and parenthood such that she now has schemas that parenthood should be in a committed union and not necessarily marriage.

While schemas may motivate action, schemas can be either conscious or unconscious (e.g., brushing ones teeth is usually motivated through an unconscious schema, most individuals know how to brush their teeth, but rarely consciously deliberate on how to brush). Thus, actions can occur with or without conscious thought. If action occurs without conscious thought most individuals are likely to report post-hoc rationalizations for their behavior. For example, a woman may have sex without using contraceptives without the conscious desire or even thought of childbearing. However, she may report a post-hoc rationalization that she wanted this child whom she now loves very much.



In this dissertation, I use empirical data to compare if the TCA or TPB are more appropriate in two different domains-- fertility intentions and the connections between marriage and fertility. If the Theory of Planned Behavior is a better predictor of fertility and family formation behaviors, then we would expect that retrospective and prospective intentions should have a high correspondence, the same sets of variables would predict both prospective and retrospective wantedness of births, and low-income Blacks do not connect the concepts of marriage and fertility. However, if the Theory of Conjunctural Action reflects how individuals interpret the world then we would expect there to be inconsistency between retrospective and prospective fertility intentions, that different schemas (or sets of variables that represent schemas) predict retrospective and prospective intentions differentially, and that low-income Blacks may connect the concepts of marriage and fertility before they have children.

## **2. Correspondence Between Retrospective and Prospective Fertility Intentions**

### **2.1 Introduction**

Unintended childbearing remains a major concern for researchers, clinicians, politicians, and advocates. Research has shown that unintended childbearing is associated with less favorable outcomes for the mother, child, and even siblings (Barber & East 2011; for reviews see, Brown & Eisenberg 1995 and Logan et al. 2007). Campaigns, funds, and organizations have been established to eliminate, or at least minimize, unintended fertility. However, the meaning of unintended childbearing, both to researchers and in the lives of women, remains elusive. Before behavior can be effectively targeted, we must better understand what measures of unintended fertility actually assess and how much this reflects reality.

Luker (1999), along with others, caution that common social science models of unintended fertility may not represent the “reality” of those studied. Luker (1999: 248) argues that “all of us—researchers, clinicians, and politicians—[need] to be constantly aware of how often human behavior refuses to conform to our models.” Evidence suggests that unintended pregnancies are much more complex than captured by typical social science models.

The traditional and dominant measurement strategy for unintended childbearing can be traced to 1941 (Campbell & Mosher 2000) when the following strategy was first used: women were asked for their retrospective reports of whether each birth was

unwanted, mistimed, or wanted at the time of conception. Westoff and Ryder popularized this measurement strategy and it has been adopted for use in hundreds of surveys in dozens of countries (e.g., the World Fertility Survey and the Demographic and Health Survey) (Westoff & Ryder 1977a; Westoff & Ryder 1977b; Ryder & Westoff 1971; Ryder 1976). Birth expectations and intentions have even been used to forecast population growth (Woolf 1971; Woolf & Pegden 1976). The only assumption is that people have clear intentions regarding their fertility and they can and will reliably report them retrospectively.

Bongaarts (1990) proposes a measurement strategy with stronger assumptions but ones commonly assumed to be reasonable by demographers, i.e., women have a fertility goal for a number of children and when this number is achieved they will attempt to stop childbearing. Thus, births up to parity  $x$  will be “wanted” and births of parity  $x+1$  will be unwanted. The data demands of this approach are modest but it rests upon strong assumptions – that there is a single stopping point for each woman. Compared to traditional retrospective measures of wantedness, this measure should have less normative response bias against reporting that a child was unwanted. The bias presumably results from parent’s reluctance to label a child as unintended or to acknowledge their birth control “failure”. Bongaarts (1990: 494) argues that in his strategy “(t)here are no obvious reasons for a woman to over- or underreport her preference for continued childbearing.” However, assumptions of the prospective

(Bongaarts) model may not accurately capture other complexities, i.e, women may not have well formed intentions and/or women can “stop” and then later decide to have additional children.

The Bongaarts model and the traditional model share certain assumptions. A theory of planned behavior (Fishbein & Azjen 2010) underlies these models and assumes that women can and do plan births. Both these models, albeit in different ways, assume that women have a certain number of desired children and any following children are ‘surplus’ unwanted children. Also, both models assume that women generally “intend” and plan births and thus unintended births are clear-cut or identifiable. The models assume that intent for births is reported taking other goals and aspirations such as schooling into account. Finally, these models take for granted that women are a homogenous group who make fertility decisions the same way regardless of other differences.

However, studies have found abundant contradictions to this model in the unintended pregnancy literature (Williams et al. 1999; Williams & Abma 2000; Trussell et al. 1999; Luker 1999; Santelli et al. 2003; Ryder 1979). As time since pregnancy increases, women are increasingly likely to change their reports of unintended pregnancies to intended (Ryder & Westoff 1969, 1972; Ryder 1973). Studies have also found prospective and retrospective intentions are inconsistent (Williams et al. 1999; Williams & Abma 2000). Williams and Abma (2000) show that about half (49.6%) of

women who stated they did not want any more children reported a subsequent birth as wanted (18% reported the birth as mistimed and 32.4% as unwanted). Of women who wanted to become pregnant in the next few years, about three-quarters (76.2%) reported a birth that occurred within two years as wanted, 20.5% reported the birth as mistimed, and 3.2% reported the birth as unwanted.

Luker (1999) argues these contradictions arise because these measures and understandings of unwanted fertility are outdated and do not measure the increasingly more complicated social reality that individuals occupy. Specifically, in 1941 when retrospective measures of unwanted fertility were first introduced, unwanted fertility was created to measure births to married mothers in their 30s and 40s having more children than they intended. Because of the unexpected baby boom, when the retrospective measure of fertility intentions was developed, political and policy interest focused on having more children than wanted at the end of the family formation cycle. Models to understand the number of excess unwanted births are more appropriate when the norm is to marry and have children. However, this model of fertility wantedness may not fit well when women have more options rather than merely marry and parent. Thus in more recent eras focus has shifted to understand the beginning of the fertility life course, specifically when and under what conditions individuals decide to become a parent rather than how many “surplus” unwanted children women have. Decisions about when and how to enter the parenting role are more complicated

because women are not only deciding on how many children to have with their marital partner, rather are deciding if they want to become a parent with this particular partner or outside of a marital union.

If Luker's assertions are correct that more women are deciding that if they want to *become* mothers in these circumstances, rather than if they had more children than planned, this leads to several hypotheses when comparing retrospective and prospective fertility intentions. First, we would expect to see a non-trivial number of births that are prospectively wanted but retrospectively unwanted and the reverse (prospectively unwanted births that are retrospectively wanted). Second, we would expect that there is lower correspondence between prospective and retrospective wanted births especially at the first birth when women are making the decision if they want to become a mother in these circumstances; in other words, we would expect that women who prospectively want births at some point would be less likely to retrospectively report the first birth as wanted compared to higher parity births. However, women who state they do not want to become parents at all would be more likely to retrospectively report their first birth as unwanted compared to women who are already mothers. For example, a woman who prospectively stated she did not want any births prior to the first birth (i.e., that she did not want to become a mother at all), would be more likely to retrospectively report that birth as unwanted compared to a mother that had two children and stated she did not want a third. The mother that had two children already made the decision to become a

mother and even though she did not want a third birth, this birth may be more likely to be retrospectively reported as wanted because the most important decision was whether or not to become a mother in these circumstances.

In contrast, if women's reports of fertility wantedness are in line with the Bongaarts (1990) measurement strategy then we would expect to see a high correspondence between retrospective and prospective fertility intentions because women plan a certain number of births and any after that number are unwanted. We would expect to see a similarly high correspondence between retrospective and prospective measures of fertility at all parities, with the exception of some prospectively unwanted births being reported as retrospectively wanted due to retrospective reporting bias. Nevertheless, there is no reason to expect that prospectively wanted births would be reported as retrospectively unwanted.

However, rather than all women following either the Luker or Bongaarts model, there may be two groups with one group of women being more likely to report their fertility intentions consistent with the Bongaarts model and another being more likely to report intentions consistent with Luker's model. Women with orderly and planned fertility life courses may have higher consistency between retrospective and prospective fertility intentions at all parities. These women may be most likely to plan their births and excess births would be unwanted. We referred to these women as having monotonic intention patterns and they have a single stopping point for prospective fertility

intentions after which they consistently report they do not want more births as Bongaarts suggested (i.e., they consistently reported they wanted more births until a certain time after which they consistently reported they did not want anymore births).

The other group of women that have less consistent intention patterns may be more likely to follow Luker's model. These women who have non-monotonic intention patterns report they want children but after they report they wanted no more births they changed their minds and reported they wanted more births. These women may have more uncertainty and a more difficult time deciding if they want to become a mother. This group of women may have less correspondence between prospective and retrospective fertility wantedness, especially at the first birth because they are deciding if they want to a mother in these specific circumstances rather than how many children to have.

In this paper, we first examine how much prospective and retrospective fertility intentions correspond for all births. Next we examine this by parity to explore if, as Luker would expect, there is lower correspondence between prospectively wanted and retrospectively wanted births at the first parity (or in the transition to parenthood) verses higher parities. Then, we examine if women with monotonic intention patterns have a higher correspondence between retrospective and prospective intentions than women with non-monotonic intention patterns. Finally, we explore the associations



between retrospective and prospective intentions by parity both for women with monotonic and non-monotonic intention patterns.

In this paper, we rely on NLSY79 data with 19 reports of prospective intentions that can be compared with retrospective reports of intendedness. We explore if women are planning a certain number of births and excess births are unwanted or if the first birth is a particular decision point with women telling researchers if they want to enter the role of parent regardless of prospective intentions. We also show substantial heterogeneity in the population. Roughly sixty percent of the women in our sample report highly consistent intentions prospectively (i.e., they consistently reported they wanted more births until a certain time after which they consistently reported they did not want anymore births). Consistent with traditional (Bongaarts) models of intendedness, these women have high associations between retrospective and prospective fertility intentions at parity 2 and above. But these women are also consistent with Luker at the first birth and even though they prospectively want a child they are equally likely to retrospectively report their first child as unwanted or wanted. The other half of the sample displays prospective intentions that are less consistent (after these women reported they wanted no more births they changed their mind and reported they wanted more births). These women have few significant associations between retrospective and prospective fertility intentions. Our descriptive work suggests that researchers need a model that acknowledges the complex situational

circumstances and cognitive processes surrounding determination of wantedness of children at all parities rather than only the first.

## **2.2 Data**

We use data from the 1979 National Longitudinal Survey of Youth (NLSY79) to compare retrospective and prospective strategies of measuring unwanted fertility. The NLSY79 is an ongoing longitudinal panel survey of a national probability sample of American civilian and military youth aged 14 to 21 years old in 1978 (Zagorsky & White, 1999).

This survey thus presents a remarkable opportunity for studying the unfolding life course and fertility history of a representative sample of Americans born in the late 1950s and early 1960s, and residing in the U.S. when the survey began. To our knowledge, no other survey provides such rich data on the parallel evolution of fertility intentions and reproductive histories from the beginning until the end of the respondents' reproductive years (by 2010, the youngest respondents were 45 years of age).

Respondents were surveyed annually until 1994, after which the survey was administered biennially. This survey, sponsored by the Bureau of Labor Statistics (BLS), was designed principally to gather longitudinal information on the labor force experiences of young American men and women. In addition, beginning in 1982, supplementary funding from the National Institute of Child Health and Human

Development (NICHD) allowed for the collection of expanded fertility information, including questions about fertility intentions. Respondents were asked about their fertility intentions in 1979, 1982-86, and biennially until the latest wave in 2010. Thus, NLSY respondents were asked their fertility intentions a total of 19 times over a 31-year period -- until respondents were age 45-53.

The NLSY79 began with a sample of 6,292 women, but several subsamples were dropped in 1990 or before. In 2010, 4,737 respondents were alive and available for re-interview (75% of the original sample). We follow women until they are lost to follow up. Also, we restrict the following analysis to women who have had children. By their last available interview, 1,359 women had not yet had a birth out of the 6,292 original sample.

The planning status of births was measured in the NLSY79 using fairly standard questions. The question which measured retrospective wantedness was the following: "Just before you became pregnant the (first, second, third, etc.) time, did you want to become pregnant when you did?" The answer choices include "yes" which we define as a wanted birth, "it didn't matter" which we label as ambivalent, "wanted a(nother) baby but not at that time" coded as mistimed, and "wanted (none/no more) at all" which is referred to as unwanted.

Prospective wantedness was measured based on intent for additional births. Women were asked if they intended a(nother) birth. If they reported "yes" in the survey

wave prior to a pregnancy, then that birth was classified as prospectively wanted. If they responded that they did not want more births for the survey wave prior to the birth then this birth is classified as prospectively unwanted. Births that occurred on or before the 1979 wave were omitted because there was no prospective report of intention.

Women had an average of 2.5 births ( $sd=1.2$ ), however each woman contributed 2.02 births to the sample analyzed because children born before 1979 did not have prospective intentions. On average all women contributed 14 waves. We have information on prospective and retrospective intentions for 6,022 births born to 2,984 women.

We also sought ways to characterize the full set of intentions—the pattern produced by the 19 reports of intentions. For instance, monotonic fertility intention patterns were defined as patterns in which women stated they wanted more children or were uncertain until a certain point and then consistently reported they wanted no additional children. Other scenarios would also produce this pattern.<sup>1</sup> Non-monotonic fertility intentions are defined by switching from no back to yes at least once.

Table 1 shows an example to clarify how we measure prospective, retrospective, and monotonic intentions. This table shows two hypothetical women with retrospective and prospective intentions as they age. The first scenario shows a woman

---

<sup>1</sup> For example, a woman who consistently reported she did not want any children would have a monotonic intention pattern.

who wanted additional births from age 18-26. She had three births, the first two were both retrospectively and prospectively wanted; however, the third birth was prospectively unwanted because in the survey wave prior she stated she wanted no more births. Nevertheless, this woman retrospectively reported this birth as wanted.

Table 1 also highlights examples of monotonic and non-monotonic intention patterns. The first row in each scenario shows intent for additional births and cells shaded in grey show when these hypothetical women said yes they intended additional births. We can see that in scenario 1, this woman consistently intended births until a single stopping point where she reported she did not intend additional births; this woman had monotonic intentions because she stated she intended more births until age 26 and then consistently stated she wanted no more births after this point. In the second scenario, this woman intended births before age 28, from age 28-34 she stated she wanted no more children but then at age 36 she stated she intended more children. Therefore, the woman depicted in the second scenario had non-monotonic intentions because she switched from not intending more births to intending more births.

Table 1. Hypothetical Lifelines Showing Fertility Intentions for Women in the NLSY

		<u>Age of Woman</u>												
		18	20	22	24	26	28	30	32	34	36	38	40	...
<b>Scenario</b> 1	Intent	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	...
	Births/Prospective			W		W			U					
	Births/Retrospective			W		W			W					
17 2	Intent	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	N	...
	Births/Prospective			W		W			U		W			
	Births/Retrospective			W		W			U		U			

## 2.3 Results

A key question is how well the measurements of unwanted fertility correspond. We examine this question by cross-classifying these measurements in Table 2 and assessing the association between the two measures. Examining births that could be classified using prospective measures of wantedness, we see that 88% of retrospectively wanted births were also defined as prospectively wanted (3,059/3,481). There is also evidence that retrospective reporting bias, expected by Bongaarts, may be operating as shown by the plurality of births that were prospectively unwanted being retrospectively reported as wanted (403 retrospectively wanted births of the 1,080 prospectively unwanted births). However, contrary to expectations of Bongaarts, out of 613 retrospectively unwanted births, the majority (346) were born to women who prospectively intended more births. The fact that more retrospectively unwanted births were to mothers who wanted more births shows this correspondence may be off.

**Table 2. Wanted and Unwanted Births by Two Methods: NLSY79**

<b>Retrospective Reports</b>	<b>Prospective Reports</b>			<b>Total</b>
	<b>Wanted</b>	<b>Unsure</b>	<b>Unwanted</b>	
Wanted	3,059	19	403	3,481
Ambivalent	211	3	78	292
Mistimed	1,298	4	334	1,636
Unwanted	346	2	265	613
<b>Total</b>	<b>4,914</b>	<b>28</b>	<b>1,080</b>	<b>6,022</b>

Also note that mothers who intended no more births reported 403 (37%) births as wanted births. Again, this type of discordance may reflect mothers' unwillingness to define a birth as unwanted. Modestly fewer, 346 births, were defined as retrospectively unwanted but the mother intended more births at the previous survey wave. Here mothers may be changing their minds between the survey wave and the timing of the pregnancy. Alternatively, they may have wanted more births eventually, but they did not want this pregnancy or to become a parent in these circumstances.

Another way we analyze the correspondence of these measurements by fitting a set of log-linear models to the data shown in Table 2. Log-linear models allow us to see the marginal free associations between retrospective and prospective fertility intentions. The first model, the model of independence, has a large chi square value allowing us to reject easily the model of independence. Subsequent models fit specific cells where there are large deviations from independence. The preferred model provides the estimates shown in Table 4. The parameter in cell  $f_{11}$  indicates that if a woman said "yes" she prospectively wanted another birth, then a "yes" answer to the retrospective question (replying "yes" that the specific pregnancy was wanted at the time of conception) is more likely by a factor of 2.78 (than the other responses in column 1). Likewise, if the prospective measure assigns an unsure answer, then the yes (wanted) is much more likely than the other two responses. The parameters in the last column indicate that if the prospective measure assigns "unwanted", then relative to retrospectively wanted,



and ambivalent, the mistimed response is less likely by a factor of .70 and the unwanted response is more likely by a factor of about 2 (2.09). The association of prospectively unsure (f21) is based on very small cell sizes.

**Table 3. Selected Models Fit to Data in Table 2**

Model	x2	d.f	
1	340.6	6	Independence (fit row and column marginals)
2	15.2	4	model 1 & yy, uu
3*	3.5	2	model 2 & tu+f21

\*Preferred model

**Table 4. Preferred Parameterization of the Association in Table 2**

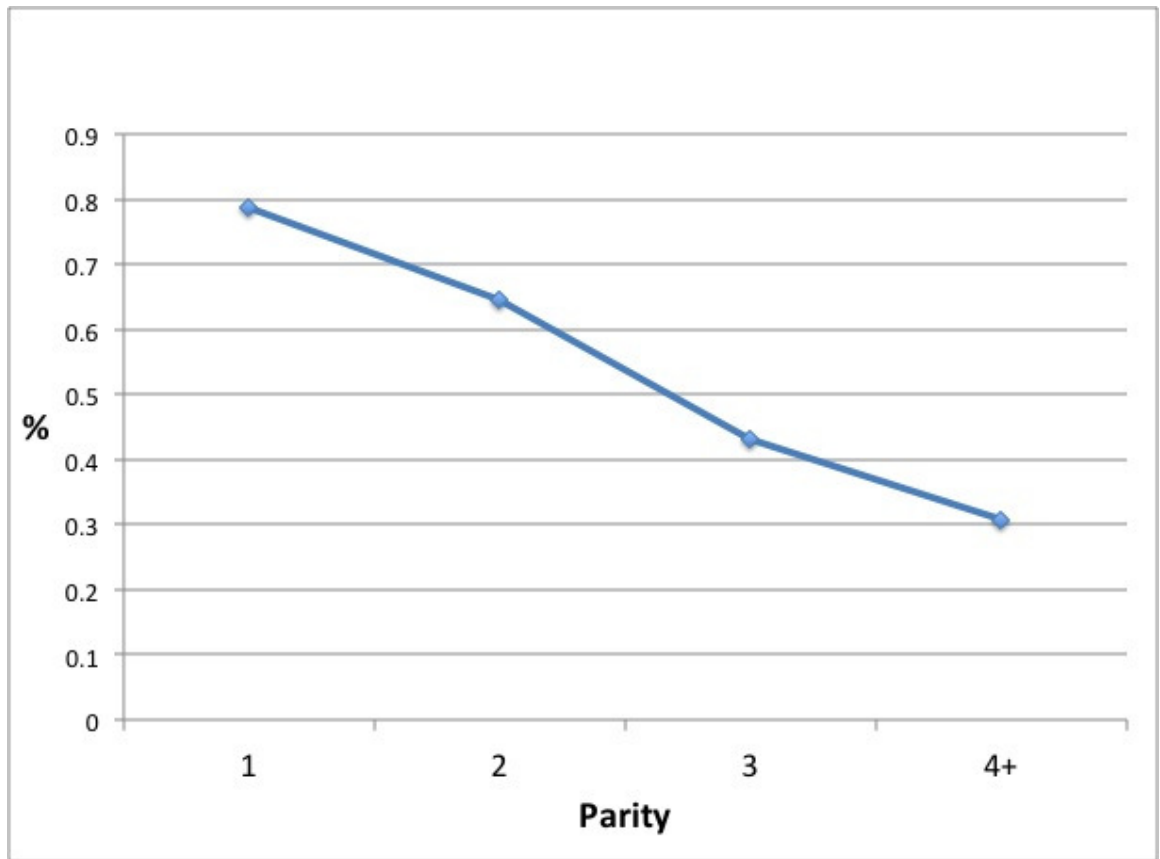
<b>Retrospective Reports</b>	<b>Prospective Reports</b>		
	Wanted	Unsure	Unwanted
Wanted	<b>2.78</b>	<b>3.56</b>	1
Ambivalent	1	1	1
Mistimed	1	1	<b>0.70</b>
Unwanted	1	1	<b>2.09</b>

This model fits the data nearly perfectly and is quite reasonable. Perhaps with the exception of the parameter in cell f<sub>21</sub> based on a small cell count, these associations have precisely the pattern we would expect. One could argue that the associations should be much stronger, but the form of the association indicates that these measures are tapping a common underlying dimension. Subsequent analysis is aimed at discovering if this association varies by parity and monotonic intention patterns.

Luker offers one explanation of the low correspondence of retrospectively unwanted

and prospectively unwanted childbearing, specifically that women may define a birth as unwanted if they intend births but did not want to become a mother in these circumstances, e.g., they may not have wanted a birth with this particular partner or at this particular life stage. There is evidence of this if many women report their first birth is unwanted even though they intended more births. To examine this, next we show similar analysis by parity.

Figure 1 lends support to this and shows that nearly 80% of women that reported their first birth as unwanted eventually wanted to have children. This figure shows the percent of births that are classified as prospectively wanted out of those that are reported by the mother as retrospectively unwanted by parity. These are births the mother reported as unwanted at the time of conception, but the mother also stated she intended more births at the survey wave prior to the birth. Again, we see that about 80% of first births reported as unwanted by the mother were also born to mothers who said they intended more births, but this percent declines for each subsequent birth. By the fourth or higher order births, only about 31% of retrospectively unwanted births were born to mothers who intended more children.



**Figure 1. Percent Prospectively Wanted of Retrospectively Unwanted by Parity**

These findings suggest that women may not understand the retrospective unwanted question in the fashion Bongaarts imagined. These women answer that they wanted no children at the time of conception of the first birth and say they intend to have children in the previous survey wave. They may be stating, as Luker asserted, that they did not want to become a mother in this situation, with this partner, or for other reasons. However, the first birth does not differ vastly from all higher parity births, rather there is a gradual decline at each subsequent parity. This is contrary to

expectations of both Luker and Bongaarts and may be due to women reporting that they do not want another child in these circumstances but as women continue their fertility life course circumstances may generally become more favorable to child rearing. Alternatively, it may be due to fewer women prospectively intending higher order parities and those who do tend to enjoy parenting, thus, they are less likely to retrospectively report these births as unwanted. Next we examine cross tabulations and log linear models by parity to explore the marginal free associations between retrospective and prospective measures of fertility by parity.

Recall, that in Luker's model intentions are measuring if women wanted to become mothers at this time, therefore first birth should have lower correspondence between the prospectively wanted and retrospectively wanted cell of Table 6 and women who did not want to become mothers should have higher correspondence between the prospectively unwanted and retrospectively unwanted cell. In contrast, following the logic of Bongaarts implies that there should be similar associations between prospective and retrospective measures of fertility at all parities.

In Table 5, we can see that the majority of retrospectively unwanted births are born to women that prospectively intend a child at both parity 1 and parity 2 (122/147 for the first birth and 116/173 for the second). Only by the third and higher parities, are more births reported as retrospectively unwanted and prospectively unwanted than retrospectively reported as unwanted and prospectively wanted. Nevertheless, log

linear models show that there is a decreasing association between reporting a birth as unwanted and being classified as prospectively unwanted as parity increases. At the first birth, a child born to a woman who wanted no births is 2.3 times more likely to be reported as retrospectively unwanted, however by the third birth mothers who reported they wanted no more births were just as likely to retrospectively report the birth as unwanted as wanted. At the second birth, associations between prospective and retrospective intentions are nearly the same as they are for the first birth. However, at the third and higher parity mothers have a higher correspondence between prospective and retrospectively wanted births.

Table 6 contradicts Luker's hypothesis that the first birth has lower correspondence between retrospectively wanted and prospectively wanted intentions than subsequent births because the correspondence is nearly the same at the first birth as the second birth. However, contrary to Bongaarts, the associations between retrospective and prospective are not similar at all parities. Only at the highest order births we find a larger association between retrospective and prospective wantedness (OR=3.15) but no association between retrospectively and prospectively unwanted births (OR=1.32). At the first two births women may be reporting if they wanted an (additional) birth in these circumstances, but by the third birth these women may enjoy and understand parenting thus they more clearly want their births and even if they did not prospectively want a child adding a third child may be easier than adding a first or second. Alternatively,

these findings may be due to combining two groups of women who make fertility decisions in different ways.

**Table 5. Wanted and Unwanted Births by Parity: NLSY79**

<b>Birth 1</b>				
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>			<b>- Total</b>
	Wanted	Unsure	Unwanted	
Wanted	1,355	8	56	1,419
Ambivalent	101	0	9	110
Mistimed	577	1	53	631
Unwanted	122	0	25	147
<b>Total</b>	<b>2,155</b>	<b>9</b>	<b>143</b>	<b>2,307</b>

<b>Birth 2</b>				
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>			<b>Total</b>
	Wanted	Unsure	Unwanted	
Wanted	1,166	4	129	1,299
Ambivalent	69	1	17	87
Mistimed	433	1	86	520
Unwanted	116	0	57	173
<b>Total</b>	<b>1,784</b>	<b>6</b>	<b>289</b>	<b>2,079</b>

<b>Birth 3+</b>				
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>			<b>Total</b>
	Wanted	Unsure	Unwanted	
Wanted	538	7	218	763
Ambivalent	41	2	52	95
Mistimed	288	2	195	485
Unwanted	108	2	183	293
<b>Total</b>	<b>975</b>	<b>13</b>	<b>648</b>	<b>1,636</b>

Table 6. Preferred Parameterization of the Association in Table 5

<b>Birth 1</b>			
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>		
	Wanted	Unsure	Unwanted
Wanted	<b>2.16</b>	<b>10.20</b>	1
Ambivalent	1	1	1
Mistimed	1	1	1.03
Unwanted	1	1	<b>2.30</b>
<b>Birth 2</b>			
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>		
	Wanted	Unsure	Unwanted
Wanted	<b>2.20</b>	2.33	1
Ambivalent	1	1	1
Mistimed	1	1	0.82
Unwanted	1	1	<b>2.02</b>
<b>Birth 3+</b>			
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>		
	Wanted	Unsure	Unwanted
Wanted	<b>3.15</b>	<b>4.21</b>	1
Ambivalent	1	<b>4.21</b>	1
Mistimed	1	1	<b>0.53</b>
Unwanted	1	1	1.32

Mothers are a heterogeneous group in which some have well planned and executed fertility life courses with one stopping point and others have more varied fertility intentions over the life course. As defined above, the first group is referred to as those with monotonic fertility intention patterns and the second group is non-monotonic.

Table 7 shows that about 40% of women in this sample have non-monotonic fertility intentions. We see that a large proportion of women change their fertility intentions from yes, to no, to yes. We find 60% of women have monotonic fertility intentions and

these women may have a more orderly life course or at least have more clearly ordered and planned fertility.

**Table 7. Fertility Intention Patterns of Women: NLSY79**

	Freq	%
Non-monotonic	1,168	0.39
Monotonic	1,816	0.61
Total	2,984	100

Tables 8 and 9 show that women with monotonic intentions have higher correspondence on both wanted and unwanted fertility measures. We can see that those with monotonic intentions and report a birth as retrospectively unwanted are over 3 times more likely for that birth to be classified as prospectively unwanted (compared to prospectively wanted). This may be because women with monotonic intentions are more likely to have well planned fertility life courses that follow Bongaarts's assumptions.



Table 8. Wanted and Unwanted Births by Intention Pattern: NLSY79

<b>Monotonic</b>				
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>			-
	Wanted	Unsure	Unwanted	
Wanted	2,003	12	183	2,198
Ambivalent	132	3	40	175
Mistimed	710	3	158	871
Unwanted	131	2	133	266
Total	2,976	20	514	3,510

<b>Non-monotonic</b>				
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>			-
	Wanted	Unsure	Unwanted	
Wanted	1,056	7	220	1,283
Ambivalent	79	0	38	117
Mistimed	588	1	176	765
Unwanted	215	0	132	347
Total	1,938	8	566	2,512

Table 9. Preferred Parameterization of the Association in Table 8

<b>Monotonic</b>				
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>			
	Wanted	Unsure	Unwanted	
Wanted	<b>3.53</b>	<b>4.59</b>	1	
Ambivalent	1.00	<b>4.59</b>	1	
Mistimed	1	1	<b>0.69</b>	
Unwanted	1	1	<b>3.13</b>	

<b>Non-monotonic</b>				
<b><u>Retrospective Reports</u></b>	<b><u>Prospective Reports</u></b>			
	Wanted	Unsure	Unwanted	
Wanted	<b>2.09</b>	<b>4.59</b>	1	
Ambivalent	1.00	<b>4.59</b>	1	
Mistimed	1	1	<b>0.69</b>	
Unwanted	1	1	<u>1.40</u>	

Also, for those with non-monotonic intentions there is only a marginally significant association (OR=1.4, P=.072) between reporting a birth as retrospectively unwanted and it being classified as prospectively unwanted. In other words, for those with non-monotonic fertility intentions if they report a birth as unwanted it is nearly as likely to be defined as prospectively wanted as prospectively unwanted. This shows that mothers with non-monotonic intentions may be more likely to be reporting retrospective intentions based on if they want to become a mother in these circumstances; nevertheless, we must examine these associations by parity to understand if this is the case.

The correspondence of measurements does vary by parity. Table 10 shows the frequency of births born to women with monotonic and non-monotonic fertility patterns by parity. Looking at log linear models in Table 11 we see that for women with monotonic patterns the predictive validity for wanted births is much higher for second and third (or more) births rather than first births. We can see that mothers with monotonic intentions who prospectively intend more births are just as likely to retrospectively report their first birth as wanted or unwanted. Thus, they may be telling us if they wanted to become a mother in these circumstances. However, as parity increases, there is much higher correspondence between retrospective and prospective intentions for women with monotonic intention patterns verses women without monotonic intentions.

Table 10. Wanted and Unwanted Births by Parity and Intention Pattern: NLSY79

Non-Monotonic Intention Patterns					Monotonic Intention Patterns				
Birth 1					Birth 1				
<u>Retrospective Reports</u>	<u>Prospective Reports</u>			Total	<u>Retrospective Reports</u>	<u>Prospective Reports</u>			Total
	Wanted	Unsure	Unwanted			Wanted	Unsure	Unwanted	
Wanted	416	3	36	455	Wanted	939	5	20	964
Ambivalent	28	0	7	35	Ambivalent	73	0	2	75
Mistimed	235	0	39	274	Mistimed	342	1	14	357
Unwanted	62	0	18	80	Unwanted	60	0	7	67
Total	741	3	100	844	Total	1,414	6	43	1,463
Birth 2					Birth 2				
<u>Retrospective Reports</u>	<u>Prospective Reports</u>			Total	<u>Retrospective Reports</u>	<u>Prospective Reports</u>			Total
	Wanted	Unsure	Unwanted			Wanted	Unsure	Unwanted	
Wanted	389	1	68	458	Wanted	777	3	61	841
Ambivalent	28	0	6	34	Ambivalent	41	1	11	53
Mistimed	189	1	36	226	Mistimed	244	0	50	294
Unwanted	72	0	25	97	Unwanted	44	0	32	76
Total	678	2	135	815	Total	1,106	4	154	1,264
Birth 3+					Birth 3+				
<u>Retrospective Reports</u>	<u>Prospective Reports</u>			Total	<u>Retrospective Reports</u>	<u>Prospective Reports</u>			Total
	Wanted	Unsure	Unwanted			Wanted	Unsure	Unwanted	
Wanted	251	3	116	370	Wanted	287	4	102	302
Ambivalent	23	0	25	48	Ambivalent	18	2	27	21
Mistimed	164	0	101	265	Mistimed	124	2	94	157
Unwanted	81	0	89	170	Unwanted	27	2	94	72
Total	519	3	331	853	Total	456	10	317	783

Table 11. Preferred Parameterization of the Association in Table 10

Non-monotonic Intention Patterns: Birth 1				Monotonic Intention Patterns: Birth 1			
		<u>Prospective Reports</u>				<u>Prospective Reports</u>	
<u>Retrospective Reports</u>	Wanted	Unsure	Unwanted	<u>Retrospective Reports</u>	Wanted	Unsure	Unwanted
Wanted	1.46	5.29	1	Wanted	1.24	1.00	1
Ambivalent	1	1	1	Ambivalent	1	1	1
Mistimed	1	1	1.32	Mistimed	1	1	1.32
Unwanted	1	1	<u>2.21</u>	Unwanted	1	1	4.18
Birth 2				Birth 2			
		<u>Prospective Reports</u>				<u>Prospective Reports</u>	
<u>Retrospective Reports</u>	Wanted	Unsure	Unwanted	<u>Retrospective Reports</u>	Wanted	Unsure	Unwanted
Wanted	1.22	1.00	1	Wanted	<b>2.88</b>	1.00	1
Ambivalent	1	1	1	Ambivalent	1	1	1
Mistimed	1	1	0.89	Mistimed	1	1	0.89
Unwanted	1	1	1.63	Unwanted	1	1	<u>3.17</u>
Birth 3+				Birth 3+			
		<u>Prospective Reports</u>				<u>Prospective Reports</u>	
<u>Retrospective Reports</u>	Wanted	Unsure	Unwanted	<u>Retrospective Reports</u>	Wanted	Unsure	Unwanted
Wanted	2.40	3.97	1	Wanted	<u>4.16</u>	3.97	1
Ambivalent	1	3.97	1	Ambivalent	1	3.97	1
Mistimed	1	1	0.54	Mistimed	1	1	0.54
Unwanted	1	1	0.98	Unwanted	1	1	<u>2.27</u>

However for unwanted births there is much lower correspondence for those with non-monotonic as opposed to monotonic patterns. For women with non-monotonic patterns, only women who prospectively intended no births (in the wave before their first birth, they said they did not want any children) are marginally more likely to report a first birth as retrospectively unwanted compared to wanted (2.21,  $p=.09$ ). For second or third or more births, there is no significant difference and prospectively unwanted births are just as likely to be reported as retrospectively wanted or unwanted. Women with consistent intentions have associations between retrospective and prospective unwanted births, whereas those with non-monotonic patterns only have significant associations at parity 1. While women with monotonic intentions have higher associations between first births that are retrospectively unwanted and prospectively unwanted (4.18) versus those with non-monotonic intentions (2.21), first births born to mothers with monotonic intentions who had a prospectively unwanted birth and also reported this birth as retrospectively unwanted is not significant because only seven women fell into this category. Even though neither of these effects are statistically significant, we can see that the effects are larger for those with monotonic and non-monotonic intentions. At higher parities, only those with monotonic intentions have statistically significant associations between births that are defined as retrospectively unwanted and are classified as prospectively unwanted. There are no such patterns for those with non-monotonic intentions.

## 2.4 Discussion and Conclusion

In this paper, we explored if women are planning a certain number of births and excess births are unwanted or if the first birth is a particular decision point with women telling researchers if they want to enter the role of parent regardless of prospective intentions. However, neither model seems to fit the data exceptionally well.

Women tend to have considerable inconsistency between retrospective and prospective measures of fertility intentions and this is not confined to retrospective reporting bias. We find that many women who prospectively intend more births are likely to retrospectively report these births as unwanted.

Also we find that correspondence between retrospectively and prospectively wanted births is not similar at all parities nor is it only low when women enter the parenting role at the first birth (except for those with monotonic intentions). Consistent with Luker's argument, women with monotonic intention patterns who prospectively intend more births are equally likely to retrospectively report the first birth as wanted or unwanted. However at higher order parities, consistent with traditional (Bongaarts) models of intendedness, these women have high associations between retrospective and prospective fertility intentions. Also, women with non-monotonic intentions only have one marginally significant association between retrospective and prospective intentions. For women with non-monotonic intentions, they are only marginally more likely to report their first birth as retrospectively unwanted if they prospectively intended no

births. At all other parities all other associations are statistically insignificant; thus, these women are just as likely to report any other birth as wanted or unwanted if they prospectively intended more births or not.

Researchers know that models will depart from reality. The idiosyncrasies of lived lives will not conform perfectly to models. But models should capture key and predictable aspects of the phenomena that we wish to study. Because unwanted fertility is such an important concept, measuring and modeling it is essential. At a minimum, evidence here points to the complexity of measuring this concept but we argue here, and in the following chapter, that using current models may codify a problematic conceptualization of unwanted fertility.

Some of this inconsistency results from ignoring uncertainty in respondents report of intent as a dichotomous response and due to failure to take the partners intent into consideration (Zabin et al. 2000; Bachrach & Newcomer 1999).

But we argue that there is something more fundamental taking place. Specifically, prospective and retrospective questions about fertility intentions may have different meanings to respondents at all parities. The prospective intent question is about a hypothetical future and a desire for more children linked to schemas about appropriate family size and having attained that family size. The retrospective questions ask about a “real” birth and prime the respondent to think about the constraints/difficulty and the love/joy associated with a recent birth.

Clearly, women are not intending a certain number of births and defining births before they hit their “target” as wanted with all others being unwanted as Bongaarts suggested. Also, women are not only retrospectively reporting only the first birth as unwanted if they do not want to transition to the mother role in these circumstances. In recent eras, women have much more complex lives. At all parities, they may be reporting if they want a birth with this partner in this type of union while working at a certain job. This work suggests that researchers require a model that acknowledges the complex cognitive processes and situational circumstances surrounding determination of wantedness of children at all parities rather than only the first.

Recent theoretical innovations suggest the interaction of context and cognition may help researchers understand how priming respondents about a real birth or pregnancy may be different from asking about a hypothetical birth (Johnson-Hanks et al. 2011; Morgan and Bachrach 2011). Schemas, or the frames through which individuals interpret the world, may give individuals an abstract representation of the contextual pieces that would be necessary to define a birth as wanted or unwanted. We propose that individuals then determine retrospective wantedness by examining these schemas and compare the context surrounding their birth to these schemas. For example, a woman may have a schema of a wanted birth as being two stably married parents; if her birth occurred outside a stable union then she would compare this to her schema of wantedness and define the birth as unwanted. Regardless if she eventually wanted more



children, she did not want a child in these specific circumstances. Individuals may answer prospective wantedness questions under the assumption that they would want more children if these hypothetical contextual requirements were met. Chapter 3 argues that different schemas govern how women report prospective and retrospective intentions.

If this were how individuals define wantedness, then retrospective measures of wantedness tell us if individuals actually felt that they were prepared to raise this child. This may be why we find that retrospective measures of wantedness are correlated with mother and child health while prospective measures are not (Brown & Eisenberg 1995; Logan et al. 2007; Maximova & Quesnel- Vallée 2009).

This study has several limitations. This is only on a certain subset of women in the NLSY79. Also, we have limited information on ambivalent fertility intentions, or births that are in between wanted and unwanted. Additionally, we do not measure how certain contextual effects such as partner change or financial stability affect these measures. Importantly, we do not have information on when women intend to have births.

We plan to examine these factors in future research, but we believe that these findings underscore the importance of understanding how individuals define births as unwanted or wanted and adds to literature that shows the complexity of fertility intentions. This study pushes researchers to move beyond current models of fertility

intentions to more fully understand how fertility intentions are conceptualized in the lives of women.

## **3. Meaning of Prospective and Retrospective Fertility Intentions**

### **3.1 Introduction**

While demographers may be beginning to see “intending” and “wanting” births as distinct dimensions underlying reports of fertility wantedness (Bachrach & Newcomer 1999), the complex cognitive processes that underlie individual’s childbearing decision-making are still unclear. The Theory of Conjunctural Action (TCA) may better represent the mechanisms underlying fertility behavior. TCA is a relatively new theory that may more accurately represent the processes by which people make complex fertility decisions. TCA brings together recent social theory (such as practice theory) with insights on dual processes operating in the mind (Johnson-Hanks et al. 2011; Morgan and Bachrach 2011).

In TCA, all processes including answering survey questions and family formation decisions occur through an interaction of schemas (or frames within the mind through which humans view and interpret the world) and conjunctures (or social context). Specifically, a conjuncture is a specific external place, time, and situation that is then interpreted inside one’s mind through one’s schemas. An individual uses these schemas to determine what is happening in the external world and how to respond (Johnson-Hanks et al. 2011; Morgan and Bachrach 2011).

In this paper, I suggest that different cognitive schemas may be more salient

when asking about prospective and retrospective fertility intentions. For example, when a woman reports prospective intentions she construes the question to be about her preferred family of the future. This may not elicit schemas that challenge this image such as her current relationship situation, work and career constraints, etc. In contrast, when she reports retrospective intentions she does so with perfect knowledge of the situation that the child was born in to and the difficulties/joys that accompanied pregnancy and the child's early life. Qualitative research (see Chapter 4) suggests that factors such as age, marital status, education, job satisfaction, and enrollment status at birth are all considered important prerequisites prior to childbearing and these factors may play a large role in determining if a woman retrospectively reports a birth as wanted or unwanted.

While all these variables may factor into both prospective and retrospective intentions, their relative importance should vary for retrospective and prospective intentions. Thus, models of predicting prospective wantedness of births should fit better when only the determinants of prospective wantedness are included (parity and number of births wanted) than when using the determinants of retrospective wantedness (age, current education, marital status, job satisfaction, and enrollment in education). In contrast, when including schemas governing retrospective wantedness (age, current education, marital status, job satisfaction, and enrollment in education) models predicting retrospective wantedness should fit better than models only including

determinants of prospective wantedness (parity and number of children wanted). If this is correct, then this lends support to the idea that different factors guide retrospective and prospective fertility intentions.

This paper tests if women are reporting prospective and retrospective intentions using different cognitive schemas. I use NLSY79 data with 19 reports of prospective intentions that can be compared with retrospective reports of wantedness. I find that there are considerable inconsistencies between retrospective and prospective reports of wantedness. I also show that women use different sets of contextual variables to report prospective and retrospective intentions. This paper acknowledges and models the complex cognitive processes surrounding determination of wantedness of children. This work adds a level of nuance and understanding of the meanings of fertility intentions elicited when individuals respond to survey questions regarding fertility wantedness and highlights issues of how individuals understand and answer survey questions that may be important for other areas of study.

## **3.2 Background**

Fertility intentions have been of great interest to demographers. This interest has been partially motivated because they are assumed to be a key proximate determinant of behavior (Fishbein & Azjen 2010). Due to this, fertility intentions have been used to understand levels of unwanted fertility (Bongaarts 1990). Under the assumption that fertility intentions are the key proximate determinant of behavior, having more births

than intended reflects unwanted fertility and/or unmet need for family planning services. The assumption is that women have a clear number of children that they want and any more children are 'surplus' unwanted children. However, while these assumptions may make modeling fertility and measuring implications more tractably feasible, they may not accurately reflect the processes guiding fertility behavior (Morgan & Bachrach 2011).

The Theory of Planned Behavior (TPB) underlies many of these assumptions and has guided much of the research on fertility intentions (Fishbein & Azjen 2010). However, this model's assumptions may collapse a complex cognitive and social process into a parsimonious but inaccurate model. In this model, individuals consciously plan births based on their own attitudes, subjective norms, and control beliefs. Background factors at the individual (e.g., personality, general attitudes, past behavior) and societal (e.g., SES, age, culture) level create behavioral beliefs, normative beliefs, and control beliefs that lead to attitudes, perceived norms, and perceived behavioral control, respectively. These factors are distal determinants that then directly lead to an intention that is the most proximate influence of behavior. While these plans can be diverted by actual control (or the persons actual ability to control fertility), individuals have clear and measureable fertility intentions that can be reported either before or after a birth has occurred.

The most used model of unintended childbearing uses retrospective reports of

whether each birth was unwanted, mistimed, or wanted at the time of conception. Researchers tend to apply TPB assumptions to retrospective measures of fertility intentions to understand unmet need for contraceptives and/or for population forecasting (Woolf 1971; Woolf & Pegden 1976).

However, researchers tend to agree that this measure is prone to reporting bias (Westoff & Ryder 1977b, 1969). Specifically, this bias presumably results from parents' reluctance to label a child as unintended. While work has examined the origin of this bias, most researchers have tried to explain away this bias rather than understanding it as a meaningful component in fertility-decision making and outcomes related to unwanted fertility. Understanding why individuals would retrospectively report an unintended child as wanted may be an important step in understanding the fertility decision making process.

To deal with, rather than explain retrospective reporting bias, Bongaarts (1990) created a new measure of wantedness. Bongaarts (1990) extends the TPB model to explicitly use prospective reports of intent for additional children to classify births as wanted or unwanted rather than relying on retrospective reports of wantedness. Using insights and assumptions from TPB, Bongaarts specifies that women want a certain number of children and continue wanting children until they have a specified number and after this all subsequent births are unwanted. Compared to traditional retrospective measures of wantedness, this measure should have less normative response bias against

reporting that a child was unwanted. The bias presumably results from parent's reluctance to label a child as unintended or to acknowledge their birth control "failure". Bongaarts (1990: 494) argues in his model "(t)here are no obvious reasons for a woman to over- or underreport her preference for continued childbearing."

However, while Bongaarts acknowledges the cognitive process that may underlie women reporting unwanted births as wanted, his model and the TPB do little to acknowledge a number of births that are prospectively wanted but reported as retrospectively unwanted (Williams & Abma 2000; Chapter 2). Abundant contradictions in the unintended fertility literature suggest that the strong assumptions underlying the Theory of Planned Behavior may be inappropriate for the complex cognitive and social process that underlie fertility behavior (Williams et al. 1999; Williams & Abma 2000; Trussell et al. 1999; Luker 1999; Santelli et al. 2003; Ryder 1979; Morgan & Bachrach 2011; Bachrach & Newcomer 1999; chapter 2).

The previous models obscure the complex and heterogeneous cognitive processes that operate when individuals report fertility intentions. Morgan and Bachrach (2011) ask how can we apply a model of planned behavior when about half of all pregnancies in the United States are unintended.

These insights have led researchers to challenge the Theory of Planned Behavior (TPB) and the models based upon it. For example, Zabin and colleagues (2000) show how each partner influences intendedness of births. Others suggest a multidimensional



model of fertility intentions and wantedness and accentuate the differences between intending and wanting a child. Researchers propose that fertility intentions are composed of two separate dimensions one being wanting a child and another being wanting to avoid pregnancy (Santelli et al. 2009; Bachrach & Newcomer 1999). Bachrach and Newcomer (1999) also suggest that fertility intentions should be viewed as two-distinct dimensions that lie on a continuum rather than a one-dimensional binary categorization. They suggest that one dimension of the continuum is planning (or the ability to plan a birth and actually accomplish these plans) and the other dimension is an affective dimension (or how happy or upset one is about a potential pregnancy).

These are important shifts and have contributed to building a general theory of family formation decision-making. While demographers are beginning to understand the complex processes underlying fertility intentions and family formation decisions. The complex cognitive processes that underlie individuals' childbearing decision-making processes are still unclear. I argue that the Theory of Conjunctural Action (TCA) may better represent the mechanisms underlying fertility behavior. TCA brings together recent social theory (such as practice theory) with insights on dual processes operating in the mind (Johnson-hanks et al. 2011; Morgan & Bachrach 2011).

TCA gives researchers a model of how all processes including answering survey questions and family formation decisions occur through an interaction of schemas (or frames within the mind through which humans view and interpret the world) and social

context. Specifically, an individual experiences a specific external social context (situation) that is then interpreted through ones' schemas and inside ones' mind.

Individuals use these schemas to determine what is happening and how to respond. In other words, individuals use schemas to define the meaning of events (including survey questions) and then use these cognitively construed meanings to guide their responses.

In Chapter Four, I show qualitative research on the various schemas surrounding childbearing, while not a representative sample (69 low-income Blacks), this may give some insight on the schemas that individuals employ when retrospectively reporting wantedness. In this research the schemas of childbearing include affective elements such as love and the beauty of creating a new life (which is congruent with previous research, see Trussell et al. 1999). Respondents also have schemas of childbearing that include contextual aspects of one's life that are suitable for childbearing. Respondents state that being done with education and having higher education, having a good job and financial stability, being married, and waiting for childbearing until the right time (or age) are all key factors important for childbearing.

These specific factors (being enrolled in education, completed education, having a good job, and age at childbearing) may be the key schemas that women use to decide if their births are wanted when asking specifically about each birth's wantedness.<sup>1</sup>

---

<sup>1</sup> While affective dimensions may be just as important as contextual dimensions of intentions, the NLSY79 has no measures the affective dimensions of childbearing.

However, other schemas may be employed when asking about potential future births or if one intends to have births in the future.

In this paper, I argue that there may be different cognitive schemas activated (or made salient) when asking about prospective and retrospective intentions. Women may report prospective intentions based on her achieved parity and how many children she previously wanted. For example, when a woman reports prospective intentions she compares her current number of children while taking into account how many children she previously desired. In contrast, when she reports retrospective intentions she may compare her schemas of when and under what circumstances she should have a child to her current situation. Thus, factors such as marital status, education, job satisfaction, age, and enrollment status may play a larger role in determining if a woman retrospectively reports a birth as wanted or unwanted.

This paper tests the hypothesis that women are reporting prospective and retrospective intentions using different cognitive schemas (which are represented by different sets of variables). I use NLSY79 data on retrospective and prospective intentions that were collected over nearly women's' whole reproductive life courses (starting at ages 14-22 in 1979 and by 2010 the youngest respondents were 45 years of age). I use these 19 reports of prospective intentions that can be compared with retrospective reports of intendedness for all births that have measurement of both retrospective and prospective wantedness. I find that there are significant

inconsistencies between retrospective and prospective reports of wantedness. Importantly, I find that prospective and retrospective wantedness are driven by different sets of contextual variables. This paper acknowledges and models the complex cognitive processes surrounding the differential determination of wantedness of children. This work adds to understanding the processes that occur when individuals respond to questions regarding family formation.

### **3.3 Data and Methods**

I use data from the 1979 National Longitudinal Survey of Youth (NLSY79) to compare retrospective and prospective strategies of measuring unwanted fertility and to examine if different sets of predictors (or schema variables) predicted prospective and retrospective measures of unwantedness better. The NLSY79 is an ongoing longitudinal panel survey of a national probability sample of American civilian and military youth aged 14 to 21 years old in 1978 (Zagorsky & White 1999).

This survey thus presents a remarkable opportunity for understanding the factors that determine how women report prospective and retrospective intentions. To my knowledge, no other survey provides such rich data on the parallel evolution of both prospective and retrospective fertility intentions and reproductive histories from the beginning until the end of the respondents' reproductive years (by 2010, the youngest respondents were 45 years of age). This extraordinary survey can give insight into how respondents report and understand fertility wantedness and allow me to test novel

theories, using information from qualitative research to guide my intuition.

Respondents were surveyed annually until 1994, after which the survey was administered biennially. This survey, sponsored by the Bureau of Labor Statistics (BLS), was designed principally to gather longitudinal information on the labor force experiences of young American men and women. In addition, beginning in 1982, supplementary funding from the National Institute of Child Health and Human Development (NICHD) allowed for the collection of expanded fertility information, including questions about fertility intentions. Respondents were asked about their fertility intentions in 1979, 1982-86, and biennially until the latest wave in 2010. Thus, NLSY respondents were asked their fertility intentions a total of 19 times over a 31-year period -- until respondents were age 45-53.

The planning status of births was also measured in the NLSY79 using fairly standard questions. The question which measured retrospective wantedness was the following: "Just before you became pregnant the (first, second, third, etc.) time, did you want to become pregnant when you did? (if no, probe: did you want a(nother) baby but not at that time, or did you want (none/no more) at all?)"<sup>2</sup> Births for which women responded "yes" are labeled as wanted births, children whose mother responded that it

---

<sup>2</sup> This question was asked either during pregnancy or after the birth occurred depending the survey year (after 1992 only women with live births were asked the retrospective question). However, using a subsample of women that had retrospective reports taken during pregnancy and after birth for the same child (due to a change in the NLSY79 survey in 1992) Joyce et al. (2002) show that reports prior to birth and after birth are very consistent.

“didn’t matter” if they became pregnant are labeled as ambivalent, mothers who reported that they “did want another birth but not at this time” were defined as mistimed, finally births that were reported by mothers who did not want any(more) children were defined as unwanted.

Prospective wantedness is measured in the following manner. Women were asked if they intended a(nother) birth. If they reported they intended a(nother) child the survey wave prior to a pregnancy, that birth was classified as prospectively wanted. If they responded that they did not want more births for the survey wave prior to the pregnancy then this birth is classified as prospectively unwanted. Births that occurred on or before the 1979 wave were omitted because there was no prospective report of intention. Also, if two births occurred between waves, I only examine the first of the two births because prospective intentions could not be calculated.

Table 12 shows a hypothetical example of how prospective and retrospective reports of wantedness were created. This Table shows a hypothetical woman’s birth and intention history captured in the NLSY as survey waves progress. Table 12 depicts a woman that had three births. The first birth occurred in 1977 or two years before the survey began; therefore, we have no prospective intentions in the prior wave (this is why the intent says no info) and prospective wantedness could not be assigned. This woman did, however, retrospectively report the birth as wanted after the survey commenced. This hypothetical woman went on to have two additional births. The first

additional birth reported in 1982 was retrospectively reported as unwanted and prospectively wanted because the wave prior the mother reported she wanted additional births. After her second birth she reported she did not intend to have any more children for several waves; nevertheless she gave birth to her third child in 1985 and while she reported it was retrospectively wanted at conception, her prospective intentions suggest that she did not want any more births.

Table 12. Hypothetical Lifeline Showing Fertility and Intent for Women in the NLSY

	75	76	77	78	79	80	81	82	83	84	85	86	...
Intent	NO INFO	NO INFO	NO INFO	NO INFO	Y	Y	Y	N	N	N	N	N	...
Births/ Prospective			N/A					W			U		...
Births/ Retrospective			W					U			W		...



The primary independent variables that are hypothesized to influence prospective intentions include parity (first birth, second birth (reference), third birth, and fourth or more) and number of children intended in 1979 (none, one, two (reference), three, and four or more).

The primary independent variables that are hypothesized to influence retrospective intentions were selected based upon qualitative research that examined schemas of childbearing and the appropriate context to have children (see Chapter 4). These variables include age at the birth, completed education, marital status, and job satisfaction measured at birth. These variables represent schemas of appropriate childbearing context as shown in Chapter 3. Age at the birth is measured by five categories: up to 20 (reference); 21-24; 25-29; 30-35; and over 36. Completed education is broken into four categories: less than high school, high school degree (reference), some college, and college degree or more. Marital status at birth is tricotomized into three categories including never married (reference), currently married, and other (including widows, divorcees, and separated women). Finally, job satisfaction was measured by asking "How do you feel about the job you have now?". The categories include, no job since last wave, like it very much (reference), like it fairly well, dislike it somewhat, dislike it very much. Because the cell sizes of those that stated they disliked their job very much were quite small, all those that reported they disliked their job were

collapsed into a dislike category. In all models I included race as a control variable. This variable was coded as Black, White (reference), and other.

The NLSY79 began with a sample of 6,292 women, but several subsamples were dropped in 1990 or before. In 2010, 4,737 respondents were alive and available for re-interview (75%). I follow women and record each birth they have that has both retrospective and prospective intentions. I record births until respondents are lost to follow up. On average women contributed 14 waves. Because I restrict the following analysis to women who have had children, I dropped 1,359 women had not yet had a birth by their last available interview. The data has prospective and retrospective intentions for 6,022 births born to 2,988 women; thus, women in this sample had an average of 2.3 births ( $sd=1.18$ ). However, only 5,671 births born to 2,884 women have values on all independent variables (or over 94% of births with both prospective and retrospective measures).

While, these may not be the only contextual variables that women used to define retrospective and prospective wantedness, it is important to test if context surrounding the birth differentially affects prospective and retrospective wantedness. Also, if different variables affect prospective and retrospective wantedness differentially, this gives support to the Theory of Conjunctural Action such that women may be using different schemas to answer questions about wanting additional births verses wanting this particular birth in these specific circumstances. If there are differences in the

reasons/schemas that affect women's prospective and retrospective intentions this may show the Theory of Planned Behavior is not an appropriate theory to use in the realm of family formation decision-making.

I perform the analysis as follows. I first show descriptive statistics. Next, I show how much retrospective and prospective intentions correspond using a cross tabulation. The following parts of the analysis only compare retrospectively wanted vs. unwanted births and prospective wanted vs. unwanted births because they are the most comparable and appropriate to test differences (this leaves 3,875 births or 68% of births with information on both retrospective and prospective intentions). Then I compare how well logistic models predicting prospective and retrospective wantedness fit using their hypothesized schema variables. Births are nested within women so within all models I clustered based on mothers. Here if the hypothesized schema variables better predict prospective or retrospective intentions, then this is evidence that those schemas are the factors operating when women report their respective intentions. Finally, I examine the standardized effect of each schema variable for both retrospective and prospective intentions; this allows for comparisons of the magnitude of the effects of each variable on retrospective and prospective intentions.

In the appendix, I give supplementary analysis that shows including retrospective schema variables to predict prospective wantedness does not add much to explain prospective wantedness and vice versa. Also, I show that prospective

wantedness is better predicted by prospective schema variables, rather than with lagged variables measured at the time prospective intentions were measured. This tests if the retrospective schema variables mattered more for prospective when women reported these intentions. Next, in the appendix, I explore how each variable effects reporting inconsistently (or prospectively reporting wanting another birth and retrospectively reporting that birth as unwanted and vice versa). Also, in the appendix, I show that current marital status is the most important factor responsible for inconsistencies in reporting retrospective and prospective reports. Finally, I show a table of logistic regressions predicting prospective and retrospective wantedness using all schema variables.

### **3.4 Results**

Table 13 shows descriptive statistics for this sample. From this table we see that Blacks are more likely than Whites to report births as both prospectively and retrospectively unwanted verses wanted. We can also see that most mothers reported in 1979 that they wanted two births. Most prospectively wanted births occurred at lower parities. In contrast, retrospectively unwanted births were similarly reported at all parities. Births retrospectively reported as mistimed and ambivalent (or “Didn’t matter”) were more likely to occur at lower parities. As women age they are more likely to report births as prospectively unwanted. Women with less than a high school degree are more likely to report births as prospectively unwanted, and women with a college degree are

less likely to report births as prospectively unwanted. Also, women that were never married or divorced were more likely to reported births as prospectively unwanted verses wanted, but women who are married are more likely to report births as prospectively wanted. Women reported a prospectively wanted birth were slightly less likely to have a job, but if they did they were more likely to like the job compared to women with a prospectively unwanted birth.

**Table 13. Descriptive Statistics by Prospective and Retrospective Wantedness**

		Prospective				Retrospective							
		Wanted		Unwanted		Wanted		Ambivalent		Mistimed		Unwanted	
		%	N	%	N	%	N	%	N	%	N	%	N
Race	White	67	3,128	45.31	454	72.8	2,404	61.05	163	52.84	808	36.13	207
	Black	26.94	1,258	46.21	463	19.53	645	35.21	94	42.32	647	58.46	335
	Other	6.06	283	8.48	85	7.66	253	3.75	10	4.84	74	5.41	31
Children Intended in 79	0	4.75	222	11.68	117	4.91	162	10.86	29	6.28	96	9.08	52
	1	6.13	286	14.37	144	6	197	6.37	17	9.48	145	12.39	71
	2	45.41	2,120	43.61	437	45.37	1,498	46.07	123	43.62	667	46.95	269
	3	19.68	919	11.48	115	20.23	668	13.48	36	17.53	268	10.82	62
	4+	24.03	1,122	18.86	189	23.53	777	23.22	62	23.09	353	20.77	119
Parity	1	43.86	2,048	12.57	126	40.88	1,350	38.2	102	38.26	585	23.91	137
	2	36.37	1,698	26.85	269	37.4	1,235	30.34	81	31.72	485	28.97	166
	3	13.96	652	32.24	323	15.11	499	13.86	37	18.9	289	26.18	150
	4+	5.8	271	28.34	284	6.6	218	17.6	47	11.12	170	20.94	120
Age	Teen-20	13.88	648	6.59	66	8.15	269	10.49	28	19.82	303	19.9	114
	21-24	26.04	1,216	15.77	158	22.08	729	17.98	48	31.92	488	19.02	109
	25-29	30.35	1,417	24.45	245	31.56	1,042	26.97	72	26.03	398	26.18	150

30-35	22.27	1,040	31.34	314	27.77	917	28.09	75	15.63	239	21.47	123
36+	7.45	348	21.86	219	10.45	345	16.48	44	6.61	101	13.44	77
Enrolled at Birth	4.75	222	2.99	30	3.3	109	4.49	12	6.08	93	6.63	38
Educ at 1st Birth												
<HS	17.76	829	25.85	259	15.75	520	19.48	52	22.17	339	30.89	177
HS	44.23	2,065	44.71	448	41.46	1,369	42.32	113	50.95	779	43.98	252
Some College	20.56	960	21.56	216	21.53	711	22.47	60	18.77	287	20.59	118
College+	17.46	815	7.88	79	21.26	702	15.73	42	8.11	124	4.54	26
Marital Status at 1st Birth												
Never Married	19.19	896	31.94	320	10.99	363	23.97	64	34.53	528	45.55	261
Married	72.05	3,364	50.4	505	81.41	2,688	62.55	167	53.11	812	35.25	202
Other	8.76	409	17.66	177	7.6	251	13.48	36	12.36	189	19.2	110
Job Stat at 1st Birth												
No job	35.45	1,655	41.72	418	32.37	1,069	33.33	89	43.43	664	43.8	251
Like A lot	29.69	1,386	25.35	254	32.98	1,089	29.21	78	23.09	353	20.94	120
Somewhat Like	28.57	1,334	25.55	256	28.74	949	32.58	87	26.29	402	26.53	152
Dislike	6.3	294	7.39	74	5.91	195	4.87	13	7.19	110	8.73	50
Births		4,669		1,002		3,302		267		1,529		573
Women		2,652		787		2,014		235		1,107		436

88

Table 14 shows the cross tabulation between retrospective and prospective fertility intentions. We can see that 267 births are retrospectively reported as ambivalent (or reported as a pregnancy did not matter). Women who would like to have more births report most of these. This shows that about 5% of births (267/5,671) are to women who have explicitly uncertain intentions. Additionally, slightly more than 20% of births retrospectively reported as mistimed are from women who said they wanted no more births in the previous wave (312/1,529). This may be an indicator of retrospective reporting bias suggested by many researchers or it may be an indicator of uncertainty.

**Table 14. Prospective verses Retrospective Wantedness**

<b>Retrospective Reports</b>	<b>Prospective Reports</b>		<b>Total</b>
	Wanted	Unwanted	
Wanted	2,928	374	3,302
Ambivalent	196	71	267
Mistimed	1,217	312	1,529
Unwanted	328	245	573
<b>Total</b>	<b>4,669</b>	<b>1,002</b>	<b>5,671</b>

Also, there is more evidence of retrospective reporting bias, with 374 births being retrospectively reported as wanted to women who wanted no more births in the wave prior (or 37%-- 374/1,002). This may be the result of women not wanting to report unwanted births as unwanted. However, nearly the same number of births, 328, are retrospectively reported as unwanted by women who said they wanted more births in the wave prior to the birth (only 7% because many more births were prospectively wanted—328/4,669). This finding cannot be attributed to giving a socially desirable



answer. Rather, it may be likely that women are retrospectively reporting their births based on if their current situation fits into their schemas of childbearing while they report their intentions based on other schemas.

To see if retrospective reports of wantedness are guided more by age, marital status, education, job satisfaction, and educational enrollment at birth while prospective wantedness was guided more by number of children desired and number children one has, I ran four logistic models predicting wanted versus unwanted births. Here I compared the model fit of logistic models predicting prospective wanted vs. unwanted births using the hypothesized prospective and retrospective schema variables and I did the same for the models of retrospective wantedness<sup>3</sup>. Table 15 shows that model fit predicting prospective wantedness using the variables hypothesized to affect prospective wantedness and those expected to affect retrospective wantedness and vice versa. In Table 15 we see that the prospective schema variables expected to affect prospective wantedness fit much better than retrospective schema variables ( $BIC_{\text{prospective schemas}}=2747$  &  $BIC_{\text{retrospective schemas}}=2951.6$ ). When modeling prospective wantedness using only parity and children intended in 1979 there is a much better fit than using the variables age, education, enrollment, marital status, and job satisfaction at birth (the difference of BICs is 204.592 favoring the model with prospective schemas). Also,

---

<sup>3</sup> In this analysis I omit the mistimed and ambivalent category from the retrospective measure of wantedness to allow prospective and retrospective measures of wantedness to be more comparable with wanted and unwanted being the only categories.

consistent with expectations, variables expected to affect retrospective wantedness fit better than variables expected to prospective wantedness. When predicting retrospective wantedness using retrospective schemas variables the BIC is 2705.8; in contrast, the BIC using prospective schemas to model retrospective wantedness is 2813.3. In sum, Table 15 shows that women's reports of prospective wantedness are modeled better by how many children she wants in the future and how many she has now; whereas, retrospective reports of wantedness are modeled better by her age, current education, her enrollment status at birth, her job satisfaction, and her current marital status.<sup>4</sup>

---

<sup>4</sup> I also test if women's prospective wantedness is more affected by their marital status, education, enrollment and job satisfactions when the intentions were measured. However, the results are similar to those presented above when predicting prospective wantedness by variables measured at the time of prospective reports. Results are available in the Appendix B.

**Table 15. Model Fit for Prospective and Retrospective Wantedness Using Prospective and Retrospective Schemas**

	<u>Predicting Prospective Wantedness Using:</u>			<u>Predicting Retrospective Wantedness Using:</u>		
	Prospective Schema Vars	Retrospective Schema Vars	Difference	Prospective Schema Vars	Retrospective Schema Vars	Difference
BIC	-29,244.602	-29,023.486	-221.11	-29,178.374	-29,269.266	90.89
AIC	0.694	0.738	-0.04	0.711	0.675	0.04
Pseudo R2	0.2173	0.1718	0.0455	0.1591	0.2074	-0.05
Stata's BIC	2,747.027	2,951.619	-204.59	2,813.255	2,705.839	107.42
Stata's AIC	2,684.404	2,851.422	-167.02	2,750.632	2,605.642	144.99

Table 16 shows the models predicting retrospective and prospective wantedness and shows the standardized coefficients to see which variables have a larger effect controlling on the other hypothesized schema variables. Here we would expect that the hypothesized prospective and retrospective schema variables should have a larger effect for their proposed outcomes. I show the differences in the values of the standardized coefficients. Consistent with expectations, Table 16 shows the effect of women's desired number of children in 1979 is consistently larger when predicting prospective wantedness (with the exception of three children) and parity has a larger effect on prospective wantedness than on retrospective reports of wantedness.

**Table 16. Logistic Regressions Predicting Prospective and Retrospective Wantedness Using Schema Variables**

Variables	<u>Prospective Wantedness</u>		<u>Prospective Wantedness</u>		<u>Retrospective Wantedness</u>		<u>Retrospective Wantedness</u>		<u>Differences in Prosp vs Retro Betas</u>		
	Prospective Schemas		Retrospective Schemas		Prospective Schemas		Retrospective Schemas		Diff	Ratio P/R	Larger For
	OR	Beta	OR	Beta	OR	Beta	OR	Beta			
Race (vs. White)											
Black	0.411*** (0.05)	-0.174	0.381*** (0.05)	-0.197	0.190*** (0.02)	-0.348	0.334*** (0.05)	-0.219			
Other	0.448*** (0.08)	-0.094	0.505*** (0.09)	-0.083	0.752 (0.19)	-0.036	1.026 (0.27)	0.003			
<b>Prospective Schemas</b>											
Children Intended in 79 (vs 2)											
0	0.274*** (0.06)	-0.133			0.571** (0.12)	-0.062			-0.071	2.15	Prosp
1	0.341*** (0.06)	-0.123			0.694 (0.14)	-0.045			-0.078	2.73	Prosp
3	1.836*** (0.30)	0.107			1.855*** (0.35)	0.116			-0.009	0.92	Retro
4	1.301 (0.18)	0.050			1.108 (0.18)	0.021			0.029	2.38	Prosp
Parity (vs 2)											

64

	1	2.857*** (0.41)	0.230			1.295* (0.15)	0.061			0.169	3.77	Prosp
	3	0.284*** (0.03)	-0.212			0.450*** (0.05)	-0.144			-0.068	1.47	Prosp
	4	0.119*** (0.02)	-0.271			0.255*** (0.04)	-0.186			-0.085	1.46	Prosp
<b>Retrospective Schemas</b>												
Age at Birth (vs <21)												
	21-24			0.552** (0.12)	-0.115			1.968*** (0.34)	0.128	-0.243	-0.90	Retro
	25-29			0.292*** (0.06)	-0.267			1.230 (0.23)	0.044	-0.311	-6.07	Prosp
	30-35			0.109*** (0.02)	-0.460			1.055 (0.21)	0.011	-0.471	-41.8	Prosp
65	36+			0.043*** (0.01)	-0.460			0.537** (0.12)	-0.089	-0.371	5.17	Prosp
Enrolled at Birth												
				1.244 (0.33)	0.020			0.801 (0.20)	-0.020	0.04	-1.00	--
Educ at Birth (vs High School)												
	Less than High School			0.525*** (0.08)	-0.116			0.677* (0.11)	-0.069	-0.047	1.68	Prosp
	Some College			1.356* (0.18)	0.058			1.235 (0.18)	0.040	0.018	1.45	Retro

	College and above		4.193*** (0.81)	0.262		3.478*** (0.87)	0.224	0.038	1.17	Prosp
	Marital Status at Birth (vs Never Married)									
	Married		2.339*** (0.35)	0.173		4.657*** (0.74)	0.308	-0.135	0.56	Retro
	Divorced		1.168 (0.21)	0.021		1.362 (0.23)	0.041	-0.02	0.51	Retro
	Job Satisfaction at Birth (vs Like A Lot)									
99	No Job		0.738* (0.10)	-0.067		1.024 (0.17)	0.005	-0.072	-	13.40 Prosp
	Somewhat Like		0.998 (0.13)	-0.000		0.814 (0.12)	-0.043	0.043	0.00	Retro
	Dislike		0.765 (0.15)	-0.030		0.528** (0.11)	-0.071	0.041	0.42	Retro
	BIC	2747.027	2951.619	2813.255	2705.839					
	N	3875	3875	3875	3875					

Exponentiated coefficients

\* p<0.05 \*\* p<0.01 \*\*\* p<0.001

When predicting retrospective wantedness, Table 16 shows that age, enrollment in education, marital status, and job satisfaction have a larger effect than when predicting prospective wantedness. Age at the birth has a larger effect on retrospective intentions for all age groups except the oldest ages. However, completed education at the birth has stronger effects when predicting prospective versus retrospective wantedness. This may be due to more educated mothers being more able to plan their births and enact these plans. Further analysis (reported in Appendix A) indicates that education does not add significantly to prospective wantedness model fit; in fact, adding education to the prospective wantedness model makes the model fit worse. The BIC for the prospective wantedness using only the hypothesized prospective schemas (children intended in 79 and current parity) has a BIC of 2747, however if education is added to this model the BIC increases to 2755 (a difference of 8—see Appendix A). This indicates a model of prospective wantedness with only number of children intended in 79 and parity is favored rather than a model with these factors and education.

### **3.5 Discussion**

In this paper, I showed that there is a great deal of inconsistency between retrospective and prospective reports of wantedness. About the same number of births are inconsistent but in opposite directions with over 300 births reported as wanted by women who said they did not want more births. Additionally, nearly as many births were reported as unwanted to women who wanted more births. This shows that the



Theory of Planned Behavior, in which women consciously plan and intend births and where unwanted births are clear-cut, may not fit how individuals actually experience their fertility life course. Clearly, using the TPB, which equates retrospective and prospective wantedness may be misguided. Retrospective reporting bias may not be bias at all, instead it may give an indication of how women understand and report their prospective and retrospective intentions.

Using qualitative work and recent theoretical innovations in family demography to guide what factors might influence this inconsistency and “bias”, the analysis presented here shows respondents attribute different meanings to prospective and retrospective measures of wantedness. This paper shows that different schemas (represented by different sets of variables) are better predictors of retrospective and prospective reports of wantedness respectively.

Specifically, when women report prospective intentions for more births they may be thinking about how many children they have and how many they wanted in the past. Basically, if they have hit their target number of children then they report they do not want any more births. In contrast, when women report if their birth is retrospectively unwanted or wanted, they compare their schemas of the appropriate context to have children to their current situation. When reporting retrospective wantedness, these women examine if they are having a young birth, are married, have a good job, and are not enrolled in school.

While all these factors may affect both prospective and retrospective intentions, their relative importance varies for retrospective and prospective intentions. This analysis shows that models predicting prospective wantedness of births fit better when only including the determinants of prospective wantedness (parity and number of births wanted) than models using the variables hypothesized to affect retrospective wantedness. In contrast, when schemas governing retrospective wantedness are included (age, education, marital status, job satisfaction, and enrollment in education) models of retrospective wantedness fit better than when using parity and number of births wanted.

This implies that schemas may drive how individuals report different measures of fertility intentions and lends support to the Theory of Conjunctural Action as a better model of fertility intentions. In TCA an intention can be a product of conscious deliberate action as we would expect from the TPB, but it may also be an unconscious process where women are not consciously planning births but instead give a post-hoc rationalization for their behavior. For example, if an individual does not consciously plan their birth, they may retrospectively report wantedness for that birth based on if they believe they are in the right place to parent; if they feel this unplanned birth was had in the right context (marital union, while having a good job, etc.) then they would be likely to report the birth as wanted.

When reporting retrospective wantedness individuals may be telling researchers if they are ready to parent in these circumstances, whereas prospective intentions may be uncovering if they have had the births they want. These findings may be why we find that retrospective measures of wantedness are correlated with mother and child health while prospective measures are not (Brown & Eisenberg 1995; Logan et al. 2007; Maximova & Quesnel- Vallée 2009).

Nevertheless, this study has limitations. First, retrospective wantedness may be a two-dimensional process, with one dimension having the right context in ones life and another dimension being the emotions related to having this child. While, both the contextual pieces and emotional pieces are found in qualitative work (see Chapter 4), with NLSY79 data we can only measure the contextual aspects surrounding childbearing. Further research should test if and how much each type of schema affects wantedness.

This also leads us to wonder if other schemas are guiding either retrospective or prospective reports of wantedness. However, this is the first study that has used insights from qualitative findings and a novel theory of family formation (TCA) to measure what schemas drive reporting of wantedness in a large-scale survey. This study shows how researchers can integrate theoretical and cognitive aspects surrounding childbearing to understand how women report wantedness and intentions in large-scale surveys.

Also, being enrolled in school has less of an effect than expected and education has a perplexing effect. Being enrolled in school only has a moderate non-significant effect on retrospective wantedness. This may be due to the small numbers of mothers enrolled in school at the time of their births (only 3.8% of mothers reporting retrospective wanted and unwanted births were enrolled near the time of the birth). Findings for education show an effect for both retrospective and prospective wantedness and an even stronger standardized effect for prospective wantedness. However, adding education to models predicting prospective wantedness lowers the fit of models predicting prospective wantedness (see Appendix A). This finding may be because prospective wantedness is related to planning of births as suggested by Bachrach and Newcomer (1999). Highly educated women may have more planned and delayed fertility life courses. These women may delay and continue to intend births thus births may be more likely to be prospectively wanted. Because of this, highly educated women may also be more likely to report a birth as retrospectively wanted but the effects are stronger for prospective wantedness.

Regardless of these limitations, this paper makes it clear that simple models such as the TPB may not be how individuals actually behave and think about their behavior. Also, this paper shows that researchers need to more deeply understand how individuals respond and cognitively define many types of survey questions. My aspiration is that findings from this paper leads researchers to question what they are

actually measuring when using survey questions as proxies for all types of phenomena and understand that survey questions may have different meanings when filtered through cognitive schemas.

## 4. Schemas of Marriage and Fertility Using Network Text Analysis

### 4.1 Introduction

Research suggests that marriage and childbearing are increasingly disconnected in low-income communities (Ellwood & Jencks, 2004). Specifically, there are increasing temporal disconnections between marriage and fertility especially for Blacks with lower socioeconomic status; this group is increasingly more likely to give birth much earlier than they marry (Gibson-Davis, 2011). This temporal separation between marriage and fertility has lead researchers to claim that that marriage and fertility are disconnected in the minds of low-income parents (Edin & Reed 2005; Gibson-Davis, 2009; Gibson-Davis, McLanahan, & Edin, 2005). Specifically, many researchers propose low-income individuals have shifted to a model of family formation in which marriage and childbearing are disconnected decisions with different prerequisites (Gibson-Davis, 2009; Edin & Kefalas, 2005; Gibson-Davis, McLanahan, & Edin, 2005). In this research, different schemas, or cognitive frames used to interpret events, are assumed to motivate behavior that then leads to a behavioral disconnection between marriage and fertility.

A limitation to this research regarding the separation between marriage and fertility is that it has only sampled parents, and it is unclear if how marriage and fertility may be connected among individuals who have *not* had a child. To address this limitation, this study will use data on low-income blacks who do not have children and a novel methodology which sheds light on the connections between marriage and

childbearing for those who are not parents.

While qualitative research has given insight into how cognition may affect decision making, recent theoretical innovations in family demography have that highlighted that schemas and material conditions drive family formation behavior through a bi-directional process (Johnson-Hanks et al. 2010; Sewell 1992; Morgan and Bachrach 2011). In other words, individuals experience conjunctures (social context or the material contexts they experience in the world) and use schemas to interpret these conjunctures, which then lead to behavior, but this behavior, can then change the schemas that shape future behavior.

Thus, low-income Blacks without children may have very different schemas of marriage and childbearing than those who have already experienced parenthood. The goal of this study is to understand how low-income Blacks connect and understand marriage and fertility *before* they have children. To do this we use 69 qualitative in-depth interviews for the Becoming Parents and Partners study which interviewed 18-22 year old low-income Blacks that had not experienced parenthood or marriage. We use novel methodology, Network Text Analysis, which connects words said in the same paragraph and present supplemental qualitative analysis.

This study makes two distinct contributions to the literature, one methodological and one substantive. First, methodologically, we use insights from computational linguistics (Blei & Lafferty 2009; Moody and Light 2006; Quinn et al. 2006) to build a

novel methodology that can then answer substantive questions regarding the connections between marriage and fertility. Because people use language to define the world, the symbolic and syntactic nature of language shows which concepts are connected to create meaning. Thus, language illuminates schemas and we use connections between words and social network patterns to map out schemas and answer our research questions. This theoretically motivated methodology can operationalize schemas and give another useful tool to understand how humans make sense of the world and the underlying mechanisms driving behavior. Using this methodology, we show insights about the connection between marriage and fertility that would not have been apparent using traditional qualitative methodology.

Our second contribution uses Network Text Analysis to answer substantive questions regarding the connections between marriage and fertility. We challenge previous research on marriage and fertility that argues marriage and fertility are cognitively disconnected, that money is only tied to marriage but not childbearing, and that the impact of childbearing is seen as a solely positive experience that provides meaning.

We use the first study designed to understand the connections between marriage and fertility that interviewed low-income Blacks before they have had children. We are also the first in the family demography literature to use this novel methodology to



provide an account of multiple marriage and fertility schemas that low-income Blacks hold and challenge prior research on the connections between marriage and fertility.

## **4.2 Background**

Sociologists have argued that schemas and material conditions drive family formation behavior, but the underlying schemas of marriage and fertility are still unclear. Schemas are how humans make sense of the world around them and they can motivate action (Johnson-Hanks et al. 2010; Sewell 1992). Schemas are learned through recurrent interaction and bring expectations/evaluations related to situations not directly visible that humans can then act upon (Sewell 1992). They are learned socially in social interactions when others enact their schemas to determine their own actions, justify their actions, evaluate the actions of others, and from explicit cultural production (e.g. movies, books, and television)(Johnson-Hanks et al. 2010). Schemas are the lens through which people construe occurrences in the world; schemas are the frames which shape meanings of events, therefore, they define possible reactions to events.

While schemas may motivate action, action can also occur with or without conscious thought and if action occurs without conscious thought individuals are likely to develop post-hoc rationalizations for their behavior. For example, an individual may have unprotected sex without the conscious desire of childbearing; schemas of love and trust between partners that dictates unprotected sex may be automatic and activated without conscious deliberation. However, in an interview after a child is conceived, a

respondent may say they wanted this child who brings meaning and love. Obviously, childbearing can be a conscious deliberate endeavor and this conjures images of ovulation calendars and/or discussion between partners about when to bring a child into their lives.

Also, schemas can change over time with experience and be used to reinterpret prior behavior. Specifically, the Theory of Conjunctural Action models action and schemas used to motivate action as a recursive process such that schemas and conjunctures (or social context) influence construal of events that then leads to behavior and possibly a new interpretation of prior and current events that then may lead an individual to change or modify their schemas, these new schemas will then be used to understand past behavior and motivate future behavior. For example, a single mother may have had a schema of marriage prior to childbearing, but after an unexpected non-marital pregnancy she may modify her schemas of marriage and parenthood such that she now believes that being a single mother shows strength and empowerment and being married before a birth is unnecessary.

Qualitative research supports that schemas of marriage and fertility are disconnected in the minds of low-income parents (Edin & Reed 2005; Gibson-Davis, 2009; Gibson-Davis, McLanahan, & Edin, 2005). Edin and Reed (2005) state, “[when discussing marriage] the subject of children almost never came up in these conversations, except for the frequent assertion that merely having a child together is

not a sufficient reason to marry.”

Prior research suggests the disconnection between marriage and fertility is due to distinct independent schemas that guide marriage and fertility behavior. Specifically, low-income women with non-marital births have much more rigorous prerequisites for marriage than childbearing. Marriage is only to be undertaken once a couple has attained substantial emotional and financial stability (Smock, Manning, & Porter, 2005; Gibson-Davis, 2009; Edin & Kefalas, 2005; Gibson-Davis, McLanahan, & Edin, 2005). Money is not seen as necessary for raising a child and emotional stability will come once a baby puts the mother on the right life path and brings meaning to her life (Edin and Kefalas, 2005).

While prerequisites of marriage nearly always include financial stability, schemas of childbearing very rarely include notions or hopes of financial stability before or during childrearing (Gibson-Davis, 2009; Edin & Kefalas, 2005; Gibson-Davis, McLanahan, & Edin, 2005). Also, regret about financial stability before childbearing are rarely expressed. Most low-income parents believe that money does little to provide the necessary time and love children need. Many low-income parents state that money is not important for parenting, as all children need is for parents to ‘be there’ to provide love and emotional support (Edin & Kefalas, 2005). In contrast, most unwed parents cite lack of financial stability as the reason they have not married. Low-income parents report they will consider marriage only after they can consistently make enough money

to survive, can use existing money wisely, can acquire assets, and have enough money to host a wedding (Gibson-Davis, McLanahan, & Edin, 2005).

Meanings of marriage include notions of attaining emotional stability before prior to initiating a marital union (Gibson-Davis, 2009; Edin & Kefalas, 2005; Gibson-Davis, McLanahan, & Edin, 2005). It is not something to step into before one is ready; in contrast, childbearing is the catalyst to stability (Edin & Kefalas, 2005). Childbearing is thought to bring meaning, bring positive emotions, and put respondents on the right life path (e.g. stop abusing drugs, running the streets, etc.); whereas marriage is only to be undertaken once an individual is already on the right path. Low-income parents feel they must be ready, have no doubts, and their relationship must be the highest quality relationship to marry (Gibson-Davis, McLanahan, & Edin, 2005). Whereas childbearing is an expected, accepted, and joyful part of the life course thus childbearing partners are not held up to the same requirements as marital partners (Gibson-Davis, McLanahan, & Edin, 2005; Edin & Kefalas, 2005).

These schemas are deemed to be important partially because they are assumed to guide behavior, but these schemas may only be used to rationalize behavior or simply change over time with experiences. Because experience and events shape and reshape schemas over time and the findings cited above are based on qualitative research done with unwed parents, it is conceivable that unwed parents may change their schemas to make sense of their current status.

Using these insights, if prior research on unwed parents is generalized to the whole low-income population, there may be a distorted image of all low-income individuals. Clearly, it is important that researchers do not apply post-hoc rationalizations of behavior that may or may not have occurred with conscious thought (such as childbearing) or schemas that have changed with the transformative experience of parenthood to all low-income blacks.

Here we use Network Text Analysis to understand if schemas of low-income Blacks who have not had children are similar to previous qualitative research on low-income parents. First, we ask if marriage and childbearing are delinked for non-parents as they are for unwed parents in prior research. Next, we ask if only marriage is linked to financial concerns while childbearing is not. Finally, we ask how low-income Blacks believe a child would impact their lives and if childbearing is seen as a wholly positive experience that brings meaning into their life. Answering these questions will show if schemas of marriage and childbearing are similar for low-income Blacks prior to having children. If they are similar, we can glean that these may be the possible reasons why low-income Blacks have children much earlier than they marry. However, if these schemas are dissimilar then this gives evidence that their schemas may be changing with experience or are post-hoc rationalizations.

If individuals link marriage and childbearing and have similar prerequisites before they have an out-of-wedlock birth, this begs different theoretical and policy answers.

Policies that focus on preventing unwed childbearing may be just as important and/or more effective than as current policies of encouraging marriage among non-married parents. Thus understanding schemas of marriage and childbearing prior to childbearing are important to create policies to prevent non-marital births.

Understanding schemas of low-income Blacks before they have children or marry also increases our theoretical understandings of marriage and childbearing. Here we elaborate meanings of childbearing and marriage and explore the links between marriage and childbearing for low-income Blacks prior to childbearing. This study gives a window to understand how schemas may possibly change over time with experience and highlight potential pathways that encourage childbearing and marriage to become delinked. Generally, we believe this study can enhance knowledge of schemas and how schemas change.

However, measurement of schemas can be difficult, time consuming, and the best current method to examine them is qualitative research; therefore, in this paper we introduce a novel methodology, Network Text Analysis, which uses connections between words and social network patterns to define schemas and examine substantive questions relating to family. The underlying assumption of this method is that people use language to evaluate their own and others behavior and to define the world, thus, language illuminates schemas. The symbolic and syntactic nature of language shows

which concepts are connected to create meaning. Thus language encodes the implicit and explicit schemas guiding family formation behavior.

Our study adds to the literature in several ways. First, this is the first study to examine schemas of childbearing and marriage of low-income Blacks who have not yet had children. Second, this is the first research that examines the link between marriage and childbearing before respondents either have children or marry. Thus, we add to the discussion of the ties between marriage and fertility. Third, we use Network Text Analysis techniques to map schemas and show how this method can add to and aid in qualitative research. We expect this to initiate discussion and thinking about how and why schemas shape family formation behaviors and change over time.

### **4.3.Data and Methods**

#### **4.3.1. Data**

In this paper I use the Becoming Parents and Partners (BPP) study, headed by Christina Gibson-Davis. This is an in-depth interview project that was designed to understand young people's meanings of childbirth and marriage *before* they experienced these life events. A team of interviewers spoke with 69 young African Americans (27 women and 42 men) living in subsidized housing in Durham who were not married and did not have children between the ages of 18-22. A team of trained interviewers and I conducted interviews which took place from 2009-2010. The 1-3 hour in-depth interviews were transcribed. We asked about the meanings and associations of marriage,

family, childbearing, and cohabitation. Our protocol is similar to the Time, Love, Cash, and Caring (TLC3) (qualitative subset of recent parents from Fragile Families).

#### **4.3.2. Methods of Interviewing and Recruiting**

I was a member team of seven (4 men and 3 women) trained interviewers recruited young childless unmarried Blacks living in subsidized housing through several channels. First, we contacted an informant who lived in subsidized housing and she referred respondents on buses, in church, and in the community as a whole. Next, we mapped out subsidized communities in Durham and put posters in convenience stores, bus stops, and other community gathering areas with phone numbers to contact and set up interviews. We also asked respondents distribute information of our study to those they knew that fit our study criteria. Lastly, we spent time in the neighborhoods and talked to individuals who then directed us to respondents.

We gender matched the interviewers and interviewees. The interviews were either scheduled over the telephone or were conducted soon after we met an individual. Most of the interviews were conducted in respondent's living room between one interviewer and one respondent (although some were conducted in parks and community gathering areas near the respondent's home). When interviews took place outside of the home, we would meet in other locations where we could find privacy (e.g., fast food restaurants, public parks)



We wanted our interviews to be as much like a natural interaction as possible. Therefore, we let interviewees determine the when topics were covered. However, interviewers did go over a consistent set of predetermined topics but the order varied based on the flow of the interview. Interviewers were trained using a detailed interview guide to make sure all domains were covered. Also, to ensure that interviews were going smoothly, there were weekly interviewer meetings to discuss issues and how to deal with them.

The interviews focused on meanings and norms surrounding marriage, cohabitation, and childbearing; marriage and childbearing aspirations and expectations; expected fulfillment from family formation changes; familial expectations and experiences; current relationships; and peers' views and experiences with marriage and fertility.

#### **4.3.3. Network Text Analysis**

Because of the virtual nature of schemas, Sewell (1992) argues they cannot be directly observed but instead are only instantiated in action, and the use of language is a unique sort of action that is both direct (how we talk embodies a particular set of communicative schema) and indirect (is used to describe, defend and frame our past actions). Language illuminates schemas well because humans use language to evaluate their own and others behavior, to justify their own actions and to define the world around them. The symbolic and syntactic nature of language shows which concepts are

connected to each other to create meaning. As such, if language is a window on how concepts are linked within minds, language encodes implicit and explicit schemas.

The underlying assumption of Network Text Analysis is, as Carley (1994) asserts, words have no meaning except in relation to other words and this method gives a roadmap of what words are connected to generate meanings. In this paper we examine which words are used in the same paragraph as ties and this links words to their local contexts, to get not just volume but co-occurrence, which can give us structure (or patterns of word co-occurrence). We can then use social network techniques to describe patterns in data, schemas and test hypotheses.

Schemas are essential to understanding any action or social structure but are difficult to operationalize. At best most research using survey data capture shallow schemas with questions about norm agreement, chosen from a limited set defined by the researcher. The fixed format response typical of such methods make it difficult to observe multiple and contradictory schemas. Question wording and survey order may also prime respondents to activate particular schemas over others. This approach thus tends toward shallow schemas in single domains rather than deep schemas applicable in many life domains. The attractions of survey data are clear: survey questions are easy to compare across cases and the format is well adapted to our analytic methods. In contrast, qualitative research can better mine deep meanings and schemas, but is time consuming and subject to high variability in researcher skill in recognizing and pursuing

key schemas. Comparisons and use are thus tedious and potentially capricious. Thus sociology is faced with an empirical dilemma: a theoretical feature key to collective human behavior is fundamentally at odds with our two primary data collection and analysis techniques.

We seek to build on new methodological approaches that bridge this divide. A growing number of researchers are trying to squeeze more information from standard sources – such as Martin’s (2002) creative treatment of multiple survey items as a “field” (rather than a scale) to capture the content-organization of people’s beliefs; but ultimately we expect we need to use new sources. One promising approach is to tap tools for mining the rich information available in the growing body of textual data available to us (see Mohr, (1998) for a review of earlier work; Blei and Lafferty (2009) or Carley (1994) for current models). We will exploit new developments in text-mining tools to systematically parse ethnographic transcripts. This thus represents a new tool with two clear audiences: on the one hand, it’s a demonstration of the usefulness of textual-modeling tools that could be extended to many sorts of free-form data. On the other, by being embedded in an on-going ethnography, we can help inform the ethnographic process directly by organizing texts in ways that the researchers might not recognize themselves.

This method gives important insights into the unconscious taken-for-granted webs of mental meaning underlying our speech. This method gives a tool to examine

schemas that bridges the gap between quantitative and qualitative analysis. Using Network Text Analysis gives researchers the tools to use qualitative data to map out schemas, quantitatively describe and test hypotheses with text data, and to combine the thick description of qualitative analysis with the replicability and formal hypothesis testing that quantitative research offers. Additionally, using this method I show findings that would not have been apparent using only traditional qualitative analysis, which illuminates the potential for Network Text Analysis to broaden research both methodologically and theoretically.

#### **4.3.4. Analysis Procedures**

Network Text Analysis is a several step procedure including preprocessing, calculating tie values between words to create text networks, clustering, calculating betweenness centrality for the text networks, and visualizing the text networks. Preprocessing prepares the textual data for analysis and allows for calculating the ties between words. Clustering shows which words group together to form schemas for our respondents. Betweenness centrality shows us which words are the most important to connect the text network. Visualization maps out co-occurrences of specific words that are embedded within a larger text network. These steps will be described in detail below.

In the first step, preprocessing, I used SAS to compile the transcribed interviews and broke them into interviewer questions and interviewee responses. Next I deleted the

interviewer questions, leaving only the answers to the interviewer questions (hereafter referred to as paragraphs). I used dictionaries available in SAS's Text Miner package to automatically replace synonyms and stem the words to their roots (e.g., want, wanting, and wanted are all stemmed to want). I removed most non-informative words such as pronouns, auxiliary verbs, interjections, prepositions, conjunctions, determiners, participles and non-text features (numbers, punctuation, non-verbal inflection cues, etc.). I also removed identifying words (such as names or locations).

I also concatenated the words stemmed to child, kid, and baby into one group (hereafter referred to as child) and the words stemmed to marriage and wedding (hereafter referred to as marriage). My findings were robust to not defining marriage and wedding, and, child, kid, and baby as synonyms.

I also deleted any term with less than 15% of people saying it (10 people) or words that occurred in 90% or more paragraphs. I ended with 563 stemmed terms in 17,562 paragraphs.

The next step is to calculate the value of ties that connecting terms. First, I used SAS's Text Miner package to create a sparse term-document matrix. There is an entry for each term that appears in a paragraph with an identifier for term and paragraph (i.e., if term<sub>i</sub> appears in paragraph<sub>j</sub> there is an entry in the matrix). Next, I use this matrix to count the total number of paragraphs that term<sub>i</sub> has appeared in and count the total

number of paragraphs  $term_i$  and  $term_j$  have co-occurred. We then have an indicator that shows the percent of paragraphs that each pair of words co-occur.

This is done for all terms and a tie is computed based on equation 1.

Eq. 1.

$$co-occurrence = \frac{\sum_{p=1}^p term_{ij}}{\sum_{p=1}^p term_i}$$

Eq. 2.

$$co-occurrence = \frac{\sum_{p=1}^p marriage \& child}{\sum_{p=1}^p marriage}$$

Eq. 3.

$$co-occurrence = \frac{\sum_{p=1}^p marriage \& child}{\sum_{p=1}^p child}$$

The strength of ties is the total number of paragraphs  $term_i$  and  $term_j$  have co-occurred divided by the total number of paragraphs  $term_i$  has appeared in. This created a directed (i.e., asymmetric) network of connections where two words can have asymmetric ties; for example, the term *child* appears in 33% of paragraphs that contain the term *marriage* (shown Equation 2), but *marriage* occurs in 23% of the paragraphs

that contain the term child (shown in Equation 3). After computing this for all pairs of words we have a network of connections between words with each node representing a word and each tie representing the percent of paragraphs these words co-occur.

The next step is to get specific schemas by finding clusters in the textual network. This is accomplished using community detection algorithms (for methods reviews, (Porter, Onnela and Mucha 2009) (Moody 2001)). In general, community detection involves dividing terms into mutually exclusive groups to maximize the number of ties *within* each group and minimize *between* group ties. A standard measure for assessing community assignment is the modularity score  $Q$ , (Guimera and Amaral 2005; Newman 2004; Newman 2006) which balances the observed number of cross community ties against the number expected at random, as in Equation 4 below.

Eq. 4.

$$Q = \sum_s \left[ \frac{l_s}{L} - \left( \frac{d_s}{2L} \right)^2 \right] \quad (1)$$

Here  $s$  indexes communities (schema),  $l_s$  the sum of edges within the community,  $L$  the total sum of edges, and  $d_s$  the sum of the degrees of nodes in community  $s$ .

Modularity reaches its maximum of 1 if all ties fall within distinct groups and has a value of zero if ties are as likely within, as between, communities. We will use a two-stage approach to identify communities. The first stage clusters the network based on

the geodesic distances in the network. We then fine-tune the initial assignment with a localized iterative search (see Moody 2001). This re-assignment improves fit in two respects. First, a term-level pass through the data ensures that each term is in the group that contains most of its ties. Second, a community-level pass examines each community to see if any communities should be merged or if large communities should be split. This two-level iterative procedure is then repeated so long as significant improvements are found.

The clusters show what concepts are connected to other similar concepts. This measures what clumps of knowledge exist in individuals' heads. Labels for each cluster are decided based upon the concepts in that cluster. I guide my labeling by identifying the most central concepts within each cluster. Because clustering algorithms cannot be calculated for directed networks, I symmetrized the matrix to the maximum tie value; in our previous example I showed asymmetric ties (child → marriage at with a tie strength of .33 and marriage → child at a .23 level), to symmetrize the network I chose to use the maximum value of the tie, or child ↔ marriage equals .33.

Next, I calculate betweenness centrality for each term. Betweenness centrality shows how much a specific term is between (or connects) all other pairs of terms in the network. This measure shows how important words are to connect the text networks; in other words, betweenness centrality shows how much the text network would break apart if that specific term was deleted from the network.



Finally, I visualize the text networks using network software (specifically, Pajek). In these visualizations, terms (or nodes) are represented by circles and the strength of ties is represented by a line connecting terms that is darker for higher tie values. The colors of the circles (nodes) which represent terms shows which cluster each term falls within and the size of nodes (or how large the circles that represent terms are) expresses the betweenness centrality of that specific term. Terms that have higher betweenness centrality, or are important to connect the term network, are larger.

In the following, I show separate figures that represent the child and marriage term network. These show all the words connected to child or marriage at a level of .3 or above (only words that co-occur with either child or marriage in 30% or more paragraphs). Then I explore the schemas (i.e., highly connected clusters of words) that are connected to child or marriage to answer if marriage and childbearing are connected, if marriage and childbearing are both connected to financial concerns, and if respondents believe that childbearing is a solely positive experience that brings meaning.

## **4.4. Results**

### **4.4.1. Network Text Analysis**

Table 17 shows the cross-tabulation of paragraphs that do or do not mention child and marriage. In 5,705 out of 17,562 total paragraphs neither marriage nor child was mentioned (17,562-11,857). Of the paragraphs that mentioned marriage (2,707), 33%

also mentioned child (899). That is, conditional on mentioning marriage, the concept of child was mentioned one-third of the time (899/2,707). Conditional on mentioning childbearing, the concept of marriage was mentioned 23% of the time (899/3,897). In other words, out of all paragraphs that contain marriage, the term child is found a third of the time, but marriage is only found in nearly a quarter of all paragraphs that have the term child.

**Table 17. Number of Paragraphs with Marriage and Child**

	Marriage Mentioned	Marriage Not Mentioned	Total
Child Mentioned	899	2,998	3897
Child Not Mentioned	1,808	11,857	13,665
Total	2,707	14,855	17,562

Odds Ratio	1.97***
P(Child   given marriage)	0.33
P(Marriage   given child)	0.23
Ratio	1.44

Findings shown in Table 17 support that marriage and childbearing are linked, but marriage is more highly related to childbearing than the reverse. The probability of saying child given marriage is 1.44 times higher than the probability of uttering marriage given child. Table 17 clearly shows the schemas of marriage and childbearing

are linked. However, the cognitive schema of marriage may be more likely to elicit child schemas than child schemas elicit marriage.

These schemas may be linked but this does not elucidate if the schemas surrounding marriage and childbearing are similar. Next we examine the term-networks<sup>1</sup> of childbearing and marriage to understand if marriage and childbearing are connected to similar concepts.

Figure 2 shows the child-term network partitioned into clusters. The colors indicate which cluster a group of terms falls into. Child is not shown because all terms are connected to child. There are 273 terms that are found with child in 30% or more of paragraphs. Of those 273 terms, 113 are connected to at least two other terms. Here we only show words that are at least connected to two other words.<sup>2</sup>

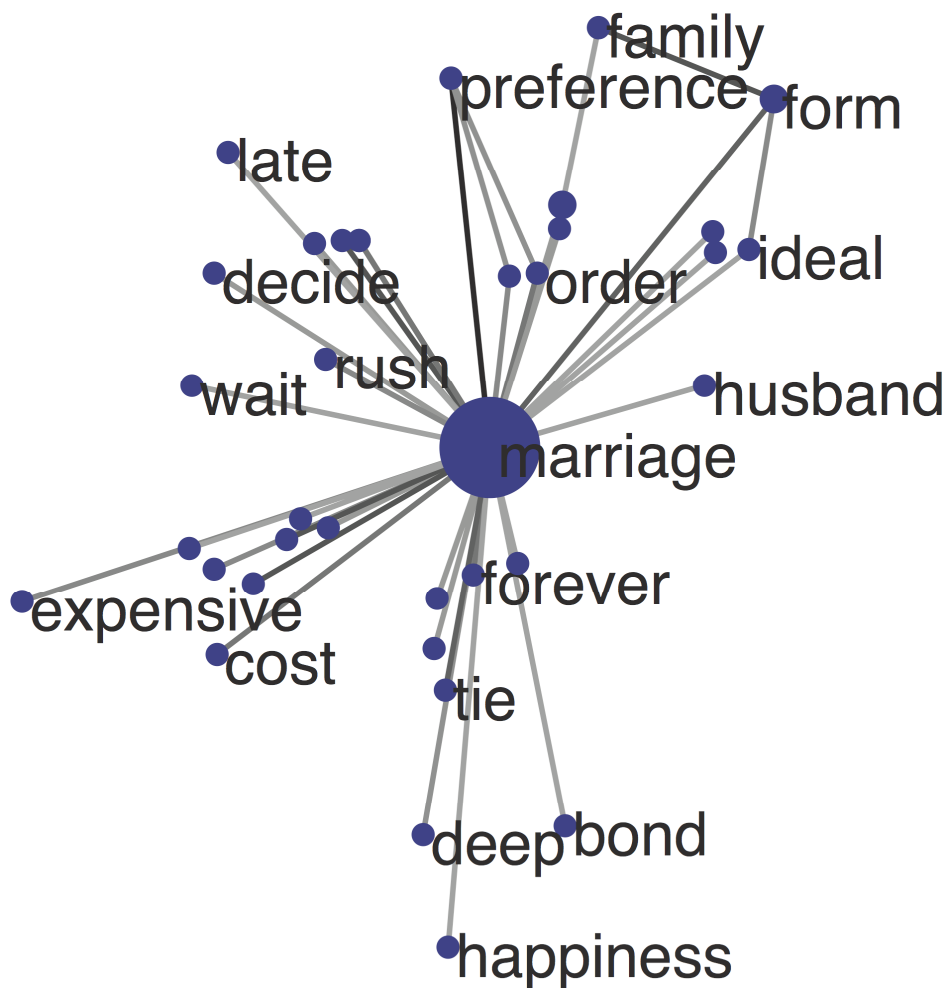
---

<sup>1</sup> A term-network is essentially an ego-network of a specific term. Term-networks show all the words connected to a specific term such as child or marriage.

<sup>2</sup> The isolated words are words that are close to words shown in the main component but are less common possible synonyms such as dollar, provide, daddy, parenthood, struggle, and parent. These 'isolated' concepts are clearly shown in the qualitative quotes and schemas that are discussed. A list of these terms is available on request.



We can in Figure 2 that marriage is connected to childbearing because it is represented by a large cluster within the child-term network. This cluster (illustrated in blue) describes marriage's connection to childbearing. Note that all terms shown in the figure are also connected to the term child. Thus, we can also see the other terms in the marriage cluster that both connected to marriage and childbearing. We can see that individuals believe that marriage should be forever, a way to form a family, and one should have deep feelings and a bond. But marriage is something to be decided upon and should not be rushed. Figure 3 shows several of these important terms from the marriage schema of the child term network.

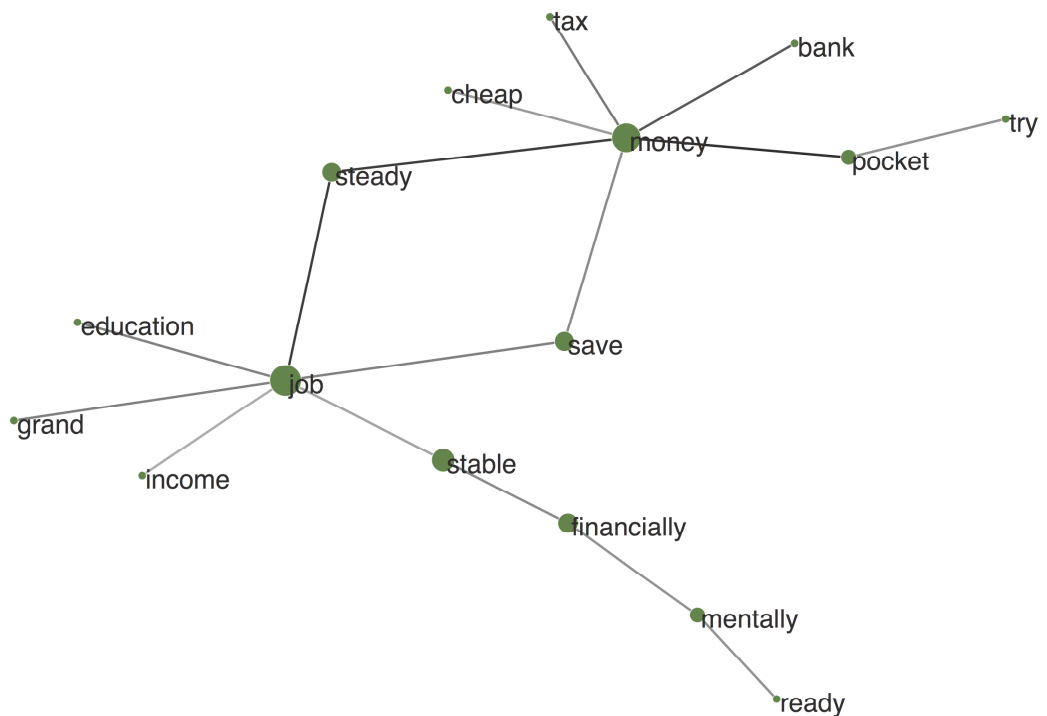


**Figure 3. Marriage Schema From Child Term Network**

We can also see in Figure 2 that the marriage schema in the child-term network is linked to terms such as cost and expensive. This brings us to the next research question, are marriage and childbearing both linked to financial concerns.

We can clearly see in Figure 2 that marriage is linked to the money cluster through the terms cost and cheap. Figure 4 shows the money schema from the child term network in depth. Consistent with prior research, marriage is closely connected to the

money schema shown in green. In the child term-network, this cluster also shows childbearings direct connection to finances and human capital. This cluster represents the monetary, educational and work requirements before having a child. This schema (cluster) illustrates that respondents believe they should have money, stable jobs, and an education before they have children.



**Figure 4. Money Schema From Child Term Network**

The money schema not only highlights that one should be financially ready but adds that one should also be emotionally/mentally ready. This contradicts the idea that emotional stability will come with childbearing.

The yellow cluster (schema) describes the things necessary to buy and/or to do for children. Respondents have a very clear conception of the things needed to be bought for children. In this cluster, respondents describe discuss diapers, clothing, food, and milk that must be bought for children.

The schemas of what to buy for children (illustrated in yellow) and socioeconomic prerequisites before childbearing (shown in green) contrast prior research which suggests money is only connected to marriage but not childbearing. The findings presented here on low-income Blacks who are not parents yet shows that the concept of finances is important for both marriage and childbearing.

Next, we answer if respondents believe that childbearing would impact their lives as a solely positive experience that brings meaning. The schema illustrated by the purple cluster in Figure 2 and Figure 5 has three main terms that highlight the emotional aspects of childbearing. This is shown in Figure 5 with two connected clusters (illustrated in aqua and black). We can see that in the purple (emotion) cluster, one sub-cluster is the concept of time to have children and time to spend with a child, one is associated with life and how children would change an individual's life, and the last is associated with feelings and connections to children. In the following, we will describe terms connected to how a child would impact respondents' life and feelings associated with childbearing.



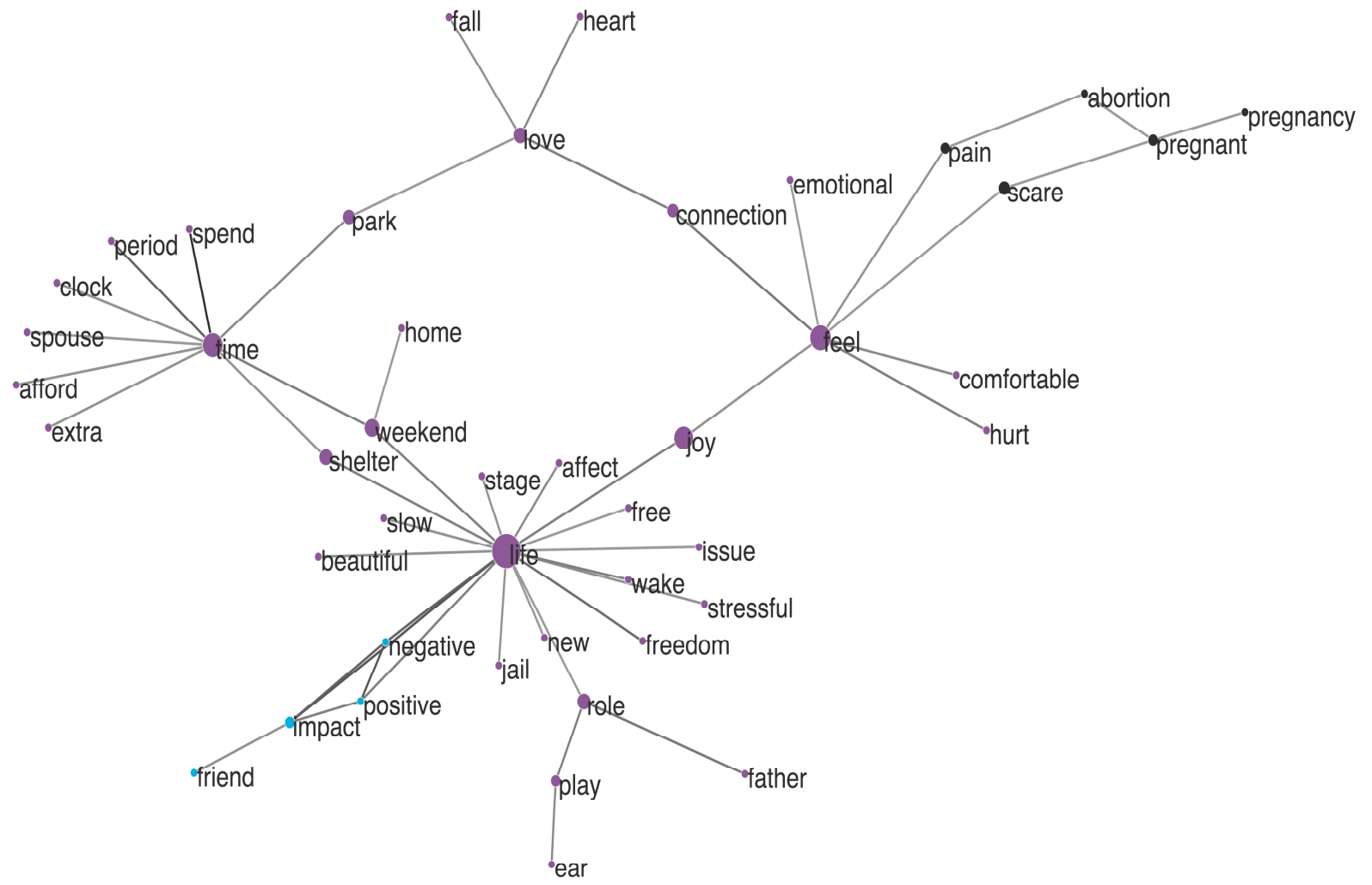


Figure 5. Emotion Schema From Child Term Network

The first sub-cluster describes how a child would change the respondent's life. We can see that respondents believe that having a child would change their lives drastically by limiting their freedom and being stressful, but childbearing is also beautiful.

This is also connected to a deeper description of the feelings and emotions related to childbearing. Respondents' schemas of feelings associated with childbearing show complex mixtures of both positive and negative emotions that are part of the childbearing experience. Our respondents have schemas that are connected to joy and love, but also hurt. The pain of abortion is also connected to this schema describing the emotional aspects of childbearing. The abortion cluster illustrated in black shows the terms scare, pain, abortion, pregnancy and pregnant.

This emotion cluster describes the mixed feelings that accompany childbearing. It describes stress and pain alongside how beautiful and deeply emotionally moving having a child can be.

The aqua cluster discusses the potential impact of childbearing on the lives of others rather than the purple emotional cluster that describes how respondents believe childbearing would impact their own lives. This cluster is connected to the purple emotion cluster but is much less elaborated. This cluster only contains three words: positive; negative; and friend. We can see that respondents have more highly developed and complicated understandings of how their own life would be affected by childbearing but much less developed conceptions for specific or generalized others.

These findings are consistent with Edin & Kefalas (2005) findings that respondents believe that childbearing could give them meaning and have a positive emotional impact; however, we can see that respondents also believe that childbearing can be stressful and bring other negative emotions. We can see that childbearing is seen as multifaceted and more complicated than solely bringing meaning and having a positive impact.

Finally, one may wonder what Network Text Analysis adds to analysis that could not have been discovered using qualitative research methodology. In the final stage of analysis, we will show that marriage schemas are encompassed within the child-term network, have no independent schemas, and that child is what holds the marriage schema together.

Figure 6 shows the term-network of marriage. The words shown here must co-occur with marriage in at least 30% or more paragraphs and must co-occur at this level with at least two other words. Marriage is not shown because all words are connected to marriage. There are 74 terms that are found with marriage in 30% or more of paragraphs. Of those 74 terms, 42 are connected to another term.<sup>3</sup>

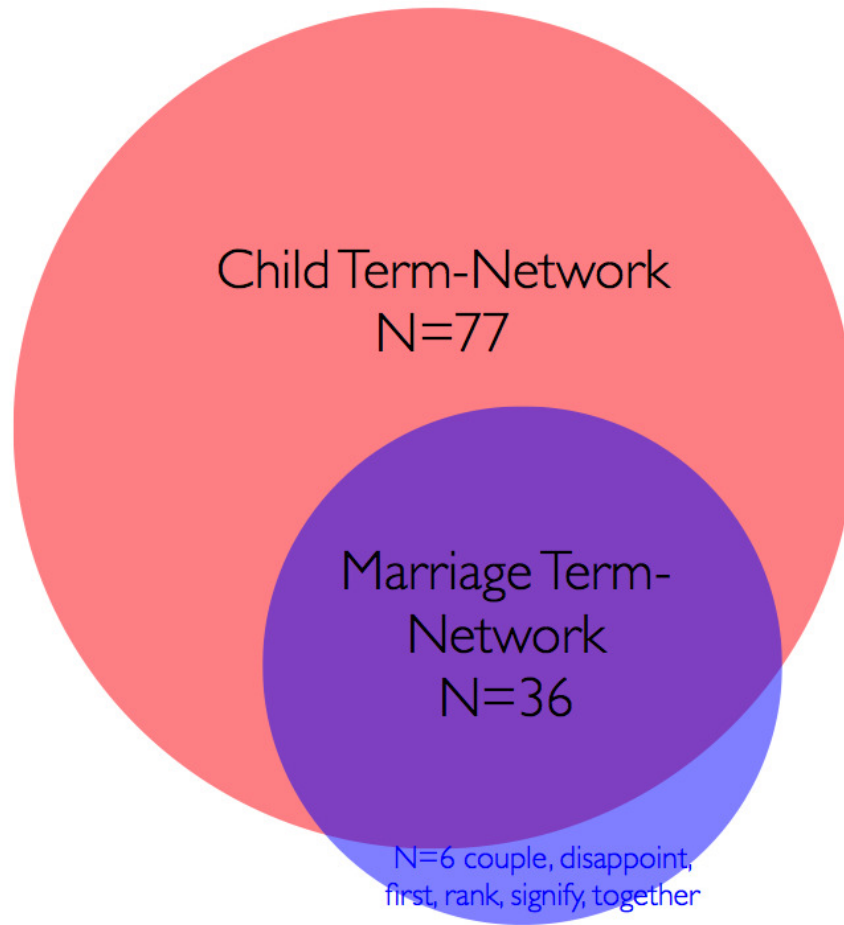
---

<sup>3</sup> There are 31 isolated terms (e.g., divorce, commit/commitment, dream, status, faithful, traditional, and engage); while these terms are connected to marriage none are connected to each other.



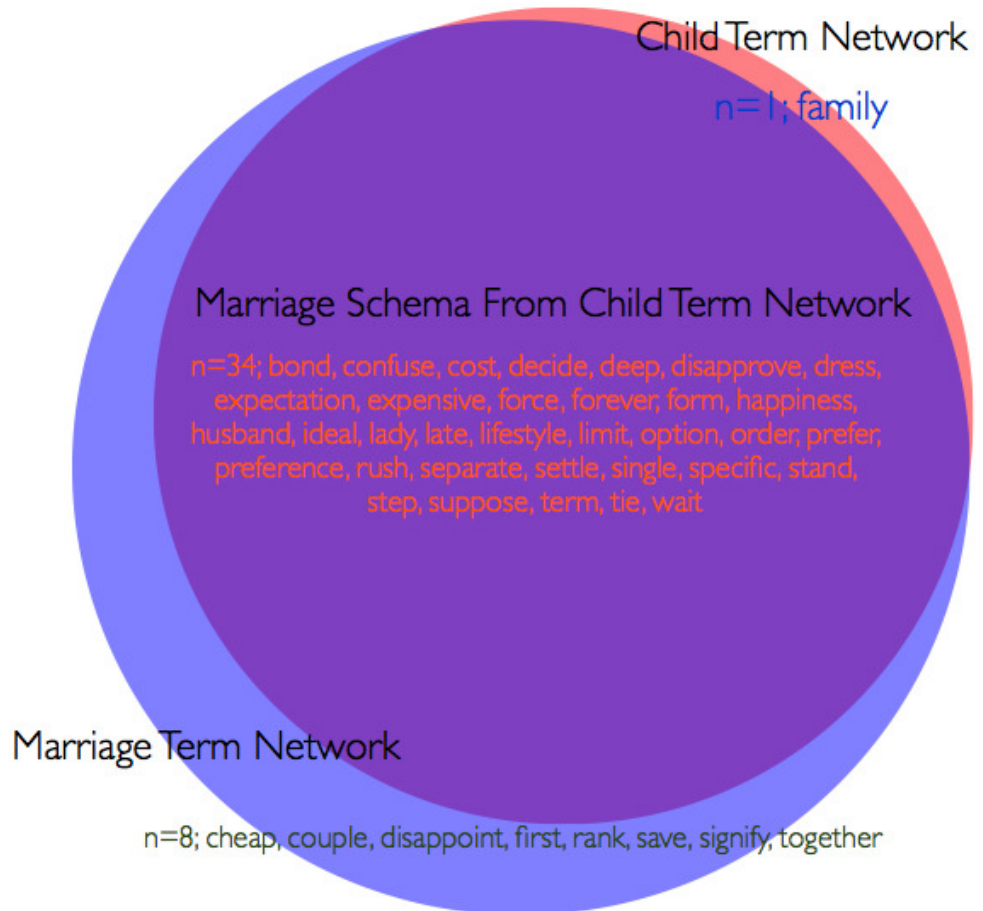
Clearly, marriage has fewer ties than childbearing (74 for marriage verses 273 for childbearing). Also, marriage has one large main component with all terms connected through child.

The marriage term-network has nearly all of the same terms found in the child term-network. Figure 7, a proportional area Venn diagram, shows that out of the 42 words, only 6 words are not in the 138-word child term-network (these words are first, couple, disappoint, signify, rank, and together).



**Figure 7. Venn Diagram Showing Overlap of Child and Marriage Term-Networks**

Not only are the same terms found in the marriage term-network and child term-network, but also the marriage term-network very closely resembles the marriage cluster in the child term network. Figure 8, another proportional area Venn diagram but only showing the marriage term-network and the marriage schema from the child term-network, shows that out of the 42 words in the marriage term network, only 8 words are not in the 35 term marriage schema of child term-network (these words are first, couple, disappoint, signify, rank, together, save and cheap). Only two more words (save and cheap) are not found in the marriage schema in the child term-network because they are found in the closely connected money schema in the child-term network. Interestingly, we can also see that the only term found in the marriage schema from the child term-network that was not found in the marriage term-network is family; this implies that the concept of family is related to marriage *and* childbearing but not marriage alone. Thus, the schemas surrounding marriage are nearly the same as those described in the child marriage cluster with the exception of a few words.



**Figure 8. Venn Diagram Showing Overlap Between Marriage Term-Network and Marriage Schema from Child Term-Network**



The schemas surrounding marriage are *quantitatively* much less complex than those surrounding child. Betweenness centralization is more than 2.25 times higher in the marriage term-network (.97) compared to the child term-network (.43).<sup>4</sup> The marriage term-network nearly has the maximum possible value for centralization (1). This is because, if the term child is cut the marriage network, the network will fall apart. In contrast, even though marriage is highly important for the child network (it has the highest *node (term)-level* betweenness centrality and closeness centrality of all terms), there is more variation in betweenness centrality of all nodes (terms). In other words, if we cut child from the marriage term-network nearly all other terms become disconnected; whereas, in the child term-network cutting marriage would not disconnect the graph to the same degree. In the child term-network several terms *other than* marriage are important for connecting the graph. Both quantitatively and visually, child is much more important for holding the marriage term-network together than marriage is for holding the child term-network together.

---

<sup>4</sup> Betweenness centrality and centralization are two different concepts and betweenness centrality is used to calculate betweenness centralization. Betweenness centrality is a node level measure of how much a specific node is between (or connects) all other pairs of nodes in the network. Betweenness centralization compares the heterogeneity in betweenness centrality between all nodes to the maximum *possible* heterogeneity in betweenness for a graph of the same size. For example, a star graph, or where all nodes are only connected to one central node, has the maximum betweenness centralization of one. In this example, if the star node is cut, the network becomes completely disconnected. In contrast, a circle graph in which every node is connected to every other node has a betweenness centralization of 0. Here any node could be cut but all nodes could still reach each other. For more information, please see Freeman (1977) or Freeman (1979).

#### 4.4.2. Qualitative Sub-Analysis

First, using qualitative analysis we see evidence that supports the findings from Network Text Analysis and supports that marriage and childbearing are indeed connected. For example, a 23-year-old man says, "then we're going to get married of course and then with marriage comes children." An 18-year-old woman concisely states, "I mean I want to get married, so yes, I want to have a baby."

However, even though we see that marriage and childbearing are linked respondents acknowledge that different decision-making processes can guide them. For example, respondents believe that marriage is seen as a choice whereas many times childbearing is not. Marriage is seen as union that you choose when you are ready both financially and emotionally, whereas childbearing is something that may 'just happen'. While it may be preferable to marry before childbearing, the choice of marriage is likely to occur after childbearing especially when so many pregnancies are unplanned or between planned and unplanned and abortion is not viewed as an acceptable option. A 19-year-old man explains,

"If you do have a child out of wedlock. I still don't think you should rush, particularly rush into marriage because, like I said that's a bond that you have choice over. A lot of times when you have a child you know you don't really have the choice, depending on the way you feel about abortion and things like that. You know you don't really have a choice."

The last quote also highlights the schema that people should get to know the other partner well and not marry solely based on an impending birth. Similar to previous

research, almost all respondents state that having a child together is not a sufficient reason to marry. A 21-year-old woman says,

"Well, if they got pregnant incidentally and they ain't married, ... they can be boyfriend and girlfriend. You shouldn't just rush and get married. You got to deal with it and take care of that baby and then the more you taking care of the baby, the more you getting to know each other, then you can get married ... So I rather for you just get to know each other more."

This corresponds with a deep reverence for marriage and it also shows that marriage and childbearing are deeply linked in the minds of low-income Blacks before they have children. However, this may not always happen due to marriage being a choice one should not rush into. Childbearing, on the other hand, should not be rushed either but many times having a child is accidental. As one respondent stated "[many children come from] unprotected sex and then love, and then boom."

There is also qualitative support that both marriage and childbearing are linked to financial concerns. Most respondents stated that couples should be financially secure before marriage and childbearing. A quote by a 21-year-old man exemplifies these important prerequisites for marriage and childbearing with a sort of wistful excitement about the idea. He says,

"First of all, you got to have your money, right, you know what I'm saying, be finished with school and all that, you know what I'm saying. When you get married, you're settling down. That's the time you get your house, that's the time you have your kids and all that. That's the time to live our life."

Nearly all respondents stated without money marriage and childbearing will be stressful and difficult. A 22-year-old woman exemplifies this theme when asked if money was important for childbearing or marriage,

" Both [are a] struggle regardless because you have to have money for formula, for the baby so if you're not going to breastfeed, ... the baby's going to drink it up ... and that stuff is not cheap. It's going to cost you. Same with being married something happened, you have to be the one to dish out money for the bills. If you don't have it you're going to be sure you're going to be constantly borrowing money or trying to pick up another job. It's going to be stressful."

Another respondents clearly explicated the perquisites prior to childbearing. She said that prior to childbearing one should have,

"Everything, home, job, stable job. If you don't have a high school diploma, stable job like something to get benefits and stuff from. Work, I mean support from your family, everything... I think it's just a little selfish when you're bringing in another life when you know you all are barely making it in your household or something like that. But you have to be stable like home, car and job and money saved up for the hard times so you got to be ready."

A 21-year-old man states similar requirements for marriage and meshes this schema of marriage with children,

"Both husband and wife bank account is good and they're ready. They got enough money saved up to handle whatever comes their way, whether it be in a nice house with a hot mortgage or kids. Just basically having a bank account so you could have something to fall back on and saving their money before you get married."

Nearly all respondents described the high costs associated with childbearing. Clearly respondents believe that money is necessary prior to childbearing. A 19-year-old woman exemplified this view,

"It's like a whole bunch of stuff that you got to pay for..., even when you're grown sometimes you ask your parents for help. And they still going to help your ass out... You never stop paying on a child, you'll never stop paying. You'll never stop paying. You gonna be paying the rest of your life."

Another respondent says "That's just money out the butt like you have to be financially ready for that period." She ends this paragraph by stating "You need like another partner. If you don't have another partner and you're by yourself, that's going to take a toll on you. So you have to be immensely ready, financially ready. If not, you're bound to break."

Respondents also elaborate the great importance and benefits of stable finances for children. A 22 year old women most clearly exemplifies this,

"You could just do more for your child. I feel like if you're financially stable [your child could do more things]... They can go to camps. They can go to all kinds of good stuff. They could have little tutors... They'd have like all kinds of stuff. But if you don't have the money to do that, in our days, you won't. Your child can just go to school and then come home and do whatever is going on in their environment. Like if you're financially stable, you can bring your child that way better, I feel like nowadays anyways what's going on in this world. You could bring them up better if you've got money. If you don't, they're just going to fall into the same hole all the rest of the, what do you call it? Statistics."

This describes the benefits for children financially and mentally stable parents but respondents also acknowledged that childbearing does not always happen under these

circumstances, when discussing what her mother wants for her a 19-year-old woman said,

"She wants me to have kids. Every parent wants their child to grow up and be financially stable first, have a good job, and you got a good husband and wife before they have a child and everything. Sometimes it don't always happen like that, but they always wish the best first. And just deal with the casualties that may come."

Clearly, we can see that both marriage and childbearing are linked to financial concerns and findings for childbearing mirrors the high economic bar for marriage found for low-income parents; however there is also an understanding and sadness that many times things do not go as hoped. These respondents clearly state that money and stability are important for raising children and that they would want have an education, job, money and relationship before childbearing but they acknowledge that this is, sadly, not always the case.

Finally, we qualitative evidence supports that childbearing may bring meaning but it may also bring stress and make lives difficult. Almost all respondents state that having a child would change their lives drastically by limiting their freedom and being stressful, but they say other aspects of childbearing are positive and bring meaning. A 22-year-old woman says without a baby, "like I can do what I want to do... I just got my freedom. [If I had a child] I won't be able to do much...I'd be waking up at night and that would just stress me." A different 22-year-old women said "Oh God, I'll be stressed out...I'm be so bitter and like, why now? I want you but why now? Why? ... [If I had a child my life]

would change dramatically." A 20-year-old man says a child would affect his life

"because I'd be stressed about how am I going to provide for this child." However, he

added that a child would positively affect his life and

"make me step my manhood up more. Like make me go out hard go hard to look for a job, like yo, I got a baby on the way, I got to do this, I got to do that. I can't sell drugs, because if I sell drugs, then I'm going to be in jail, then I'm not going to be here to support my kid. So I got to get a job, so I can be that father figure that my father was to me."

Respondents describe complex mixtures of both positive and negative emotions that are part of the childbearing experience. A 19-year-old woman says,

"I feel honestly, it's a beautiful thing. You're bringing a life into the world, especially when you love each other. That's not just you, it's the both of you put together. That's technically going to bind you for the rest of your life. So therefore, throughout the drama, throughout the heartache, throughout the tears and pain, that child is always going to look at you and [think] I love you, that's my mommy, that's my daddy."

This cluster describes the mixed feelings that accompany childbearing. It describes stress and pain alongside how beautiful and deeply emotionally moving having a child can be.

While respondents seem to understand that childbearing can bring meaning, positive emotions, along with stress and negative emotions, they tend to believe that for others "all babies is a positive experience, not negative." They also state that babies motivate people to "do something positive so they could be out here with the child and

not do nothing negative so they'll end up in jail and missing the early time of the child's life."

This isn't surprising that respondents have more highly developed and complicated understandings of how their own life would be affected by childbearing but much less developed conceptions for specific or generalized others. This is consistent with Edin & Kefalas (2005) findings that respondents said their child gave them meaning, changed their life positively and made them stay out of trouble and/or stop doing drugs. However, we see that the potential personal impact of childbearing is much more complicated.

#### **4.5. Discussion**

Research proposes that low-income individuals family formation behaviors are guided by distinct disconnected schemas in which marriage and childbearing (Gibson-Davis, 2009; Edin & Kefalas, 2005; Gibson-Davis, McLanahan, & Edin, 2005). In studies of low-income non-wed parents, marriage is only undertaken once couples have emotional and financial stability. Whereas childbearing is an accepted and expected part of the life course and not subject to these same considerations that brings meaning and positive emotions (Gibson-Davis, 2009; Edin & Kefalas, 2005; Gibson-Davis, McLanahan, & Edin, 2005).

However, in this paper we found that these findings may not apply to low-income Blacks that are not parents. We find that marriage and childbearing are highly



connected, that both marriage and childbearing are both linked to financial concerns, and that respondents do believe childbearing would bring both meaning and positive experiences while also being stressful and difficult.

The disconnection of marriage and fertility may be an artifact of interviewing mothers rather than a generalized sentiment of most low-income individuals. Here we use data from the Becoming Parents and Partners study which interviewed 69 low-income Black men and women who were unmarried and did not have children. We use Network Text Analysis that connects words used in the same paragraph and counts of co-occurrence of marital related words and fertility related words along with traditional qualitative coding.

From Network Text Analysis we show an important finding that may not have been recognized from traditional qualitative analysis. Specifically, we show the key role of the idea of child in marriage, and the important, but more marginal role of marriage in the child term-network. The interconnected component of marriage is merely a subset of the child term-network and the component is easily broken apart by merely removing the word child from the marriage term-network. Taken together, this implies that schemas of marriage are much less interconnected and perhaps less cognitively complex and defined.

Instead of marriage being the key component that ties childbearing to other family schemas, childbearing is the well-defined broad schema that ties sub-schemas

together. In other words, the child term-network seems to hold the primary family schemas in which marriage is one segment.

This may be due to individuals in low-income Black communities having less experience with marriage than childbearing. On the other hand, this may be a broad shift in the family schemas in which childbearing is the most important schema that ties all other schemas to it. However, this question is beyond the scope of this paper.

From the supplemental qualitative analysis we find that respondents stated that often individuals cannot achieve financial and emotional stability before childbearing because many births are accidental. The high incidence of unplanned pregnancies combined with a negative view of abortion may create many births before financial or emotional stability is attained. As one respondent succinctly stated, “[Most births are from] unprotected sex and then love, and then boom.” These respondents acknowledge these are not the most desirable circumstances to bring a child into this world but they “just deal with the casualties that may come.”

This suggests that Network Text Analysis and qualitative analysis both add to our understanding of the connections between marriage and fertility, albeit in different ways. Network Text Analysis shows us that childbearing may contain the most important family schemas of which marriage is one component. While, qualitative analysis shows us that respondents acknowledge that the hopes for marriage and financial stability prior to childbearing are often and sadly thwarted. Nevertheless,

respondents hope and believe that they will be part of the minority (27% in 2009) of Blacks that marry and then have a child (Hamilton et al. 2010.).

This suggests that Network Text Analysis and traditional qualitative analysis inform each other, may work best to be used together, and/or may highlight different aspects that inform research questions. Nevertheless, I believe Network Text Analysis has a great deal of promise. At the very least, Network Text Analysis can simplify qualitative research and help researchers figure out where to look to make the process less time consuming. However, my hope is that the methods described above will become a tool to examine schemas that bridges the gap between quantitative and qualitative analysis. This method gives researchers the tools to use qualitative data to map out schemas, quantitatively describe and test hypotheses with text data, and to combine the thick description of qualitative analysis with the replicability and formal hypothesis testing that quantitative research offers. Network Text Analysis, especially in concert with traditional qualitative analysis, gives contradictory and thick descriptions with numerical representation while being much less time intensive and allows researchers the opportunity to use larger resources of text than has ever been possible. As shown in this paper, with Network Text Analysis new research questions and themes emerge which broaden research both methodologically and theoretically. I hope these efforts can bridge the qualitative/quantitative divide while enlarging and transforming the scope of possible answerable questions for all sociologists.

In sum, using both Network Text Analysis and qualitative methods, our study of low-income childless Blacks clearly states the most desirable choice is to have children after marriage, financial stability, and emotional stability, but this is difficult especially when childbearing is not necessarily a choice. Marriage, on the other hand, is a choice and one can hold out until these prerequisites are met.

This may be because different types of thought govern fertility and marriage behavior rather than different schemas; fertility and/or sexual behavior may come about without much conscious thought. For example, this could be due to alcohol induced unprotected sex discussed by respondents or that other schemas not connected to childbearing are most salient in sexual relationships. For example, research that shows that unprotected sex demonstrates trust in a relationship and condoms use tends to dissipate over time (Brady et al. 2009; Katz et al. 2000; Pleck et al. 1988; Santelli et al. 1996). This combined with a generally negative view of abortions may lead to many unplanned and non-marital births. In contrast, marriage may be governed by conscious thought. Marriage generally demands at least some conscious thought either related to obtaining a marriage license and/or the time it takes to plan a wedding.

Another possibly for the disconnection between marriage and childbearing for low-income Black mothers, but not for low-income Blacks without children is that when people cannot achieve their desired goals due to unplanned pregnancies or lack of marriageable males and they may change their schemas of marriage and childbearing. It

is quite plausible that low-income Blacks may shift their views of marriage and childbearing and thus disconnect the concept of marriage and childbearing after having a child out-of-wedlock.

This study cannot test if individuals change their views of marriage and childbearing when they have a birth; however, it seems unlikely that low-income mothers never held the “American Dream” or “Middle-Class Family” schema along with its temporal ordering (i.e. marriage before children). Rather, the inability of achieving those culturally valued goals in communities with few, if any, marriageable males combined with a generally negative view of abortion may push future mothers to attempt to at least acquire one of these valued goals. Low-income mothers may disconnect marriage and childbearing to reduce cognitive dissonance, are post-hoc rationalizations, or more simply these women may learn that marriage prior to childbearing is nearly impossible and waiting may cause one to give up both goals. Our study is suggestive that low-income individuals connect marriage and childbearing, prefer to marry before childbearing, and have similar prerequisites for marriage and childbearing. Nevertheless, when low-income individuals cannot achieve these goals due to structural constraints or simply a pregnancy ‘just happens’ and marriage is a decision, they may cognitively and behaviorally disconnect marriage and fertility. Thus, the disconnect between marriage and fertility may not be because people have always believed these concepts are disconnected, rather people believe these concepts are

disconnected because their life experiences suggest that marriage before childbearing is a “fairy tale...like on TV” (respondent when discussing marriage).

## 5. Conclusion

In this work, I showed that the Theory of Conjunctural Action is a better representation of how individuals understand and report fertility and family formation behaviors. I show there are many inconsistencies between retrospective and prospective fertility intentions and these inconsistencies are due to different schemas guiding prospective and retrospective intentions. When reporting retrospective wantedness individuals are activating schemas that tell researchers if they are ready to parent in these circumstances, whereas prospective intentions are showing if they have had the number of births they want.

Also, I show that contrary to previous findings that low-income parents do not link marriage and fertility and have different requirements for marriage and fertility, I find that marriage and childbearing are indeed linked and have similar requirements for low-income Blacks prior to childbearing. Low-income Blacks hold quite traditional views about the role of marriage and its sequencing vis-à-vis fertility. I argue that the material constraints to marital childbearing may lead to non-marital births and thus respondents sever schemas connecting marriage and childbearing and adopt other schemas of childbearing to provide ad hoc justifications for their behavior.

In sum, this shows that individuals generally do not have intentions that are reflected in their behavior, rather their intentions and schemas shift based on their current experiences and the contexts they live within. It makes sense that individuals

would have different schemas guiding hopes and if these hopes do not pan out then they change their schemas.

These findings, which support the Theory of Conjunctural Action, opens up novel areas of inquiry and pushes researchers to understand the complex ways individuals understand their world and what guides their behavior. It is important to understand when individuals do consciously plan and intend behavior and when they do not. Also, it is important to understand the differences between pre- and post-hoc explanations of behavior and when schemas change. Understanding how material conditions in the world explain shifts in schemas is another fruitful area of research that can now be explored.

Even though insights from the Theory of Conjunctural Action may be influential in determining family variation and change, they are very difficult to measure. While material conditions are relatively simple to measure, schemas are much more difficult to operationalize. However, in this dissertation, I show potential ways to assess schemas and how to use these schemas in large-scale survey research.

The difficulty in measuring schemas led me to adapt a novel methodology, Network Text Analysis, which uses social network techniques adapted to “word networks” to build a relational network of words that are used together. Patterns of frequent word associations appear and represent meaning or mental schemas. The analysis task is to decipher meanings from these word networks.



I believe this method, adapted from Jim Moody's social network techniques, has a great deal of promise. At the very least, network text analysis can simplify qualitative research and help researchers figure out where to look to make the process less time consuming. However, my hope is that the methods described above will become a tool to examine schemas that bridges the gap between quantitative and qualitative analysis. This method gives researchers the tools to use qualitative data to map out schemas, quantitatively describe and test hypotheses with text data, and to combine the thick description of qualitative analysis with the replicability and formal hypothesis testing that quantitative research offers. NTA gives contradictory and thick descriptions with numerical representation while being much less time intensive and allows researchers the opportunity to use larger resources of text than has ever been possible. Additionally, with NTA new research questions and themes emerge which broaden research both methodologically and theoretically. I hope these efforts can bridge the qualitative/quantitative divide while enlarging and transforming the scope of possible answerable questions for all sociologists.

In the research shown here, I have developed research methodology is uniquely suited for this. I have engaged in cutting edge work that measures schemas and advances social demography both theoretically and methodologically. This work meshed both qualitative and quantitative methodologies in innovative ways. I believe this sort of research will advance sociology and allow people to model complex

cognitive phenomena along side material conditions to have a deeper understanding of human behavior.

## Appendix A. Including Other Variables as Schema Variables

Table 18 shows logistic regressions predicting prospective wantedness and Table 19 predicts retrospective wantedness using the hypothesized schema variables and then adds in the schema variables from the other group one at a time. Here we can see if moving schema variables from the other group produce a better fit and/or have a larger effect.

When modeling prospective wantedness with retrospective wantedness schema variables we can see that most variables make the prospective wantedness fit worse. Either including education or enrollment at birth increases the BIC by 8 ( $BIC_{\text{prospective schemas}}=2747$  &  $BIC_{\text{prospective schemas+educ}}=2755$ ). Similarly, including job satisfaction at birth in prospective wantedness models increases the BIC by nearly 23 ( $BIC_{\text{prospective schemas}}=2747$  &  $BIC_{\text{prospective schemas+job}}=2770$ ). Because the BIC increased when including these retrospective schema variables we can conclude that these variables do not add much to explaining prospective wantedness.

However, when modeling prospective wantedness, we can see that adding age at birth makes the model fit better ( $BIC_{\text{prospective schemas}}=2747$  &  $BIC_{\text{prospective schemas+age}}=2704.5$ ). However, the standardized effect of age at birth at the youngest age is consistently larger for when modeling retrospective wantedness ( $B_{\text{prospective age21-24 vs. teen-20}}=.045$  &  $B_{\text{retrospective age21-24 vs. teen-20}}=.128$ ). This may be because the youngest mothers are more likely

to have a prospectively wanted birth, but retrospectively report that birth as unwanted compared to slightly older mothers. This may be due to schemas that a young birth is to be avoided but being in ones early 20's is closer to right time to have a birth. In addition, age may affect prospective intentions because as women age they are more likely to report they do not want anymore births thus making it more likely to have a prospectively unwanted birth.

Also, including marital status at birth makes the fit of the prospective wantedness model better ( $BIC_{\text{prospective schemas}}=2747$  &  $BIC_{\text{prospective schemas+marital status}}=2717$ ). Nevertheless, marital status at birth has a much larger standardized effect on retrospective wantedness than prospective wantedness.

As for retrospective wantedness, number children intended in 1979 makes the retrospective wantedness model fit much worse ( $BIC_{\text{retrospective schemas}}=2705.8$  &  $BIC_{\text{retrospective schemas+children intended in 79}}=2718.9$ ). But adding parity makes the retrospective model fit better ( $BIC_{\text{retrospective schemas}}=2705.8$  &  $BIC_{\text{retrospective schemas+parity}}=2607.9$ ), but the standardized coefficients show that parity has a much larger effect on prospective verses retrospective wantedness.

While certain variables may factor into both prospective and retrospective intentions, there relative importance varies for retrospective and prospective intentions.

Table 18. Logistic Regressions Predicting Prospective Wantedness Using Schema Variables & Adding in Other Variables

Variables		<u>Prospective Wantedness</u>											
		<u>Prospective Schemas</u>		<u>Prospective Schemas+Age</u>		<u>Prospective Schemas+Enroll</u>		<u>Prospective Schemas+Educ</u>		<u>Prospective Schemas+Marital Status</u>		<u>Prospective Schemas+Job</u>	
		OR	Beta	OR	Beta	OR	Beta	OR	Beta	OR	Beta	OR	Beta
Race (vs. White)													
	Black	0.41*** (0.05)	-0.17	0.36*** (0.04)	-0.20	0.41*** (0.05)	-0.18	0.43*** (0.05)	-0.16	0.60*** (0.08)	-0.10	0.410*** (0.05)	-0.18
	Other	0.45*** (0.08)	-0.09	0.42*** (0.08)	-0.10	0.45*** (0.08)	-0.10	0.47*** (0.09)	-0.09	0.50*** (0.09)	-0.08	0.44*** (0.08)	-0.10
<b><u>Prospective Schemas</u></b>													
Children Intended in 79 (vs 2)													
	0	0.27*** (0.06)	-0.13	0.28*** (0.06)	-0.13	0.27*** (0.06)	-0.13	0.27*** (0.06)	-0.13	0.28*** (0.06)	-0.13	0.27*** (0.06)	-0.13
	1	0.34*** (0.06)	-0.12	0.34*** (0.07)	-0.12	0.34*** (0.06)	-0.12	0.36*** (0.07)	-0.12	0.36*** (0.07)	-0.12	0.34*** (0.06)	-0.12
	3	1.84*** (0.30)	0.11	1.92*** (0.32)	0.11	1.84*** (0.30)	0.11	1.82*** (0.29)	0.10	1.77*** (0.28)	0.10	1.84*** (0.30)	0.11
	4	1.30 (0.18)	0.050	1.37* (0.19)	0.06	1.30 (0.18)	0.05	1.24 (0.17)	0.04	1.22 (0.17)	0.04	1.31* (0.18)	0.05



Less than High School			0.92 (0.13)	-0.02		
Some College			0.98 (0.13)	-0.00		
College and above			1.86** (0.36)	0.11		
Marital Status at Birth (vs Never Married)						
Married					2.31*** (0.34)	0.16
Divorced					1.10 (0.20)	0.01
Job Satisfaction at Birth (vs Like A Lot)						
No Job						1.09 (0.14)
Somewhat Like						1.05 (0.15)
						0.02
						0.01

Dislike						0.84 (0.18)	-0.02
BIC	2747.027	2704.509	2755.239	2755.053	2717.002	2769.995	
N	3875	3875	3875	3875	3875	3875	

**Table 19. Logistic Regressions Predicting Retrospective Wantedness Using Schema Variables & Adding in Other Variables**

Predicting Retrospective Wantedness

Variables	<u>Retrospective Schemas</u>		<u>Retrospective Schemas+Children Intended in 79</u>		<u>Retrospective Schemas+Parity</u>	
	OR	Beta	OR	Beta	OR	Beta
131 Race (vs. White)						
Black	0.334*** (0.05)	-0.219	0.340*** (0.05)	-0.214	0.391*** (0.06)	-0.180
Other	1.026 (0.27)	0.003	0.980 (0.26)	-0.002	1.106 (0.31)	0.012
<u>Prospective Schemas</u>						
Children Intended in 79 (vs 2)						
0			0.706 (0.17)	-0.036		
1			0.842 (0.17)	-0.020		
3			1.707**	0.095		



				(0.32)			
	4			0.934	-0.013		
				(0.15)			
Parity (vs 2)							
	1					1.765***	0.122
						(0.23)	
	3					0.442***	-0.134
						(0.06)	
	4					0.269***	-0.163
						(0.05)	
<b>Retrospective Schemas</b>							
Age at Birth (vs <21)							
	21-24	1.968***	0.128	1.964***	0.127	3.052***	0.203
		(0.34)		(0.35)		(0.57)	
	25-29	1.230	0.044	1.250	0.047	2.558***	0.191
		(0.23)		(0.23)		(0.52)	
	30-35	1.055	0.011	1.050	0.010	2.786***	0.200
		(0.21)		(0.21)		(0.64)	
	36+	0.537**	-0.089	0.552**	-0.084	1.574	0.062
		(0.12)		(0.13)		(0.41)	
Enrolled at Birth		0.801	-0.020	0.809	-0.018	0.688	-0.031
		(0.20)		(0.21)		(0.17)	
Education at Birth (vs High School)							
	Less than High School	0.677*	-0.069	0.662*	-0.072	0.937	-0.011
		(0.11)		(0.11)		(0.16)	
	Some College	1.235	0.040	1.182	0.031	1.123	0.021

	College and above	(0.18) 3.478*** (0.87)	0.224	(0.18) 3.416*** (0.86)	0.219	(0.17) 2.546*** (0.64)	0.161
Marital Status at Birth (vs Never Married)							
	Married	4.657*** (0.74)	0.308	4.553*** (0.73)	0.301	5.384*** (0.90)	0.323
	Divorced	1.362 (0.23)	0.041	1.347 (0.23)	0.039	1.640** (0.29)	0.063
Job Satisfaction at Birth (vs Like A Lot)							
	No Job	1.024 (0.17)	0.005	1.035 (0.17)	0.007	1.324 (0.22)	0.059
	Somewhat Like	0.814 (0.12)	-0.043	0.814 (0.12)	-0.042	0.835 (0.12)	-0.036
	Dislike	0.528** (0.11)	-0.071	0.540** (0.11)	-0.068	0.553** (0.12)	-0.064
BIC		2705.839		2718.897		2607.891	
N		3875		3875		3875	

## Appendix B. Model Fit for Prospective and Retrospective Wantedness Using Prospective, Retrospective, and Retrospective time t-1 Schemas

Table 20. Model Fit for Prospective and Retrospective Wantedness Using Prospective, Retrospective, and Retrospective time t-1 Schemas

	<u>Predicting Prospective Wantedness Using:</u>		
	Prospective Schema Vars	Retrospective Schema Vars- time t	Retrospective Schema Vars time t-1
BIC	-29244.602	-29023.486	-29040.516
AIC	0.694	0.738	0.734
Pseudo R2	0.2173	0.1718	0.1768
BIC used by stata	2747.027	3232.903	3212.653
AIC by stata	2684.404	2851.422	2834.392

In Table 20, I show the same analysis with lagged variables measured at the time prospective intentions were measured. This tests if the retrospective schema variables mattered more for prospective when measured at the time women reported these intentions.

We can see that models predicting prospective wantedness using retrospective schema variables measured at the time prospective intentions were measured fit better than using retrospective schemas variables measured at the time of birth ( $BIC_{\text{retrospective schemas at time t}}=3232.903$  &  $BIC_{\text{retrospective schemas at time t-1}}=3212.653$ ). Nevertheless, prospective schema variables fit much better than either measure of retrospective intentions. This lends support to the idea that prospective wantedness is guided more by number of

children women wanted in 1979 and how many children she has, rather than the retrospective schema variables regardless of when they are measured.

## **Appendix C. Predicting Inconsistency with Retrospective and Prospective Schema Variables**

Table 21 shows how each variable affects reporting inconsistently (or prospectively reporting wanting another birth and retrospectively reporting that birth as unwanted and vice versa). I use a multinomial logistic regression predicting if women's births are wanted on both prospective and retrospective reports, prospectively wanted and retrospectively unwanted, unwanted on both measures, or prospectively unwanted and retrospectively wanted.

**Table 21. Multinomial Logistic Regressions Predicting Consistency Between Prospective and Retrospective Wantedness Using Schema Variables**

		Compared to Wanted by Both Measures			Compared to Unwanted by Both Measures		
		Prosp Unwanted & Retro Wanted	Unwanted by Both Measures	Prosp Wanted & Retro Unwanted	Wanted by both	Prosp Unwanted & Retro Wanted	Prosp Wanted & Retro Unwanted
		RRR	RRR	RRR	RRR	RRR	RRR
<b>Race (vs. White)</b>							
137	Black	2.233*** (0.40)	3.870*** (0.80)	1.673** (0.28)	0.258*** (0.05)	0.577* (0.13)	0.432*** (0.09)
	Other	0.492 (0.20)	2.317* (0.80)	1.762** (0.38)	0.432* (0.15)	0.212*** (0.09)	0.760 (0.27)
<b><u>Prospective Schemas</u></b>							
<b>Children Intended in 79 (vs 2)</b>							
	0	2.108* (0.63)	4.142*** (1.38)	4.440*** (1.10)	0.241*** (0.08)	0.509 (0.19)	1.072 (0.36)
	1	0.996 (0.28)	2.788*** (0.75)	2.609*** (0.57)	0.359*** (0.10)	0.357** (0.11)	0.936 (0.24)
	3	0.609* (0.14)	0.356*** (0.10)	0.592** (0.11)	2.810*** (0.79)	1.710 (0.54)	1.662 (0.52)
	4	0.863	1.043	0.702*	0.958	0.827	0.673

		(0.17)	(0.24)	(0.12)	(0.22)	(0.19)	(0.17)
Age at Birth (vs teen-20)		0.299***	0.519	0.824	1.929	0.577	1.590
	21-24	(0.06)	(0.18)	(0.22)	(0.67)	(0.21)	(0.65)
		0.310***	0.802	0.864	1.247	0.386**	1.077
	25-29	(0.07)	(0.29)	(0.24)	(0.45)	(0.14)	(0.45)
		0.231***	1.509	2.088*	0.663	0.153***	1.383
	30-35	(0.06)	(0.57)	(0.60)	(0.25)	(0.06)	(0.61)
		0.417**	3.903**	4.666***	0.256**	0.107***	1.196
	36+	(0.13)	(1.62)	(1.47)	(0.11)	(0.05)	(0.56)
Parity (vs 2)							
	1	0.581***	0.287***	0.389***	3.485***	2.026*	1.356
		(0.09)	(0.08)	(0.07)	(0.94)	(0.58)	(0.42)
	3	1.940***	4.726***	2.713***	0.212***	0.411***	0.574*
		(0.34)	(0.91)	(0.42)	(0.04)	(0.10)	(0.13)
	4	3.835***	11.516***	5.777***	0.087***	0.333***	0.502**
		(0.97)	(2.90)	(1.14)	(0.02)	(0.10)	(0.13)
<b>Retrospective Schemas</b>							
	Enrolled at Birth	1.289	1.351	0.721	0.740	0.955	0.534
		(0.37)	(0.51)	(0.28)	(0.28)	(0.36)	(0.26)
	Education at Birth (vs High School)						
	<High School	1.082	1.367	1.292	0.731	0.791	0.945
		(0.22)	(0.33)	(0.23)	(0.18)	(0.20)	(0.24)
	Some College	0.850	0.948	0.811	1.055	0.896	0.856
		(0.16)	(0.20)	(0.14)	(0.23)	(0.22)	(0.21)
	College+	0.445**	0.240**	0.364***	4.167**	1.854	1.516
		(0.14)	(0.11)	(0.08)	(1.90)	(1.03)	(0.71)

Marital Status at Birth (vs Never Married)							
		0.161***	0.139***	0.401***	7.202***	1.158	2.888***
	Married	(0.03)	(0.03)	(0.08)	(1.72)	(0.30)	(0.74)
		0.669	0.482**	0.750	2.074**	1.388	1.556
	Divorced	(0.14)	(0.13)	(0.18)	(0.54)	(0.37)	(0.42)
Job Satisfaction at Birth (vs Like A Lot)							
	No Job	0.718	0.774	0.959	1.291	0.927	1.239
		(0.15)	(0.19)	(0.16)	(0.32)	(0.27)	(0.32)
	Somewhat Like	1.095	1.303	0.858	0.767	0.840	0.659
		(0.20)	(0.30)	(0.15)	(0.17)	(0.23)	(0.16)
	Dislike	1.727*	2.111*	1.116	0.474*	0.818	0.529
		(0.45)	(0.67)	(0.29)	(0.15)	(0.31)	(0.19)
BIC		5372.050					
N		3875					

139

Exponentiated coefficients

\* p<0.05 \*\* p<0.01 \*\*\* p<0.001



## **Appendix D. Testing if Current Martial Status is more important than Change in Martial Status**

Previous research (Williams et al. 2000) has suggested that there is less correspondence between prospective and retrospective measures of intendedness possibly because martial status may change between the time that prospective and retrospective intentions are measured. For example, if a woman said she wanted no more births and gets remarried she may now want to have a birth; similarly, a married woman may say she intends more births but if she divorces then she may change her mind and retrospectively report the birth as unwanted.

While these concepts make sense, they collapse complex fertility decision making into a TPB framework in which women consciously plan births and prospective and retrospective intendedness mean the same thing unless one marries or encounters some other sort of change.

In this dissertation, I argue that is a reductionist argument and change should matter less than current status because women answer retrospective and prospective intention questions using different schemas.

To show this, I have predicted inconsistent intentions (represented by four groups—wanted on both measures, prospectively wanted but retrospectively unwanted, prospectively unwanted but retrospectively wanted, and unwanted on both measures).

I used all of the schema variables. My marital change variable included the categories no change, got married, and union dissolved.

If change in marital status fits significantly better when predicting inconsistency then we can conclude that marital change is an important factor in explaining inconsistent reports of wantedness. If however, change is not important in explaining inconsistency this is more evidence that women retrospectively report births on current marital status and respondents do not change their prospective intentions but rather they report these measures using different factors.

Table 22 shows the BICs for models including previous marital status, current marital status, marital status change, and marital status change plus current marital status. We see weak support for the model using marital status at time t-1 (marital status at time t-1 has the lowest BIC but is only about 2.3 less than current marital status, so this difference may be due to the .8 correlation between marital status at time t and t-1 and a slight amount of noise). Also, only including marital change gives a much worse fit.

Therefore, the preferred model would be either using current marital status or marital status at time t-1. However, this lends support to the argument that marital change matters less than current status to predict inconsistency between retrospective and prospective reports of wantedness.

**Table 22. Model Fit for Predicting Consistency Between Prospective and Retrospective Wantedness Using Change in Marital Status**

Predicting Inconsistency in Wantedness Using:

	M1: Marital Status t-1	Marital Status at t	Marital Status Change (btw t-1 & t)	Marital Status Change & Marital Status at t
BIC	5369.753	5372.05	5528.84	5375.657
Diff btw M1 & Current Model		-2.297	-159.087	-5.904

**Appendix E. Logistic Regressions Predicting  
Prospective and Retrospective Wantedness Using All  
Schema Variables**

Table 23. Logistic Regressions Predicting Prospective and Retrospective Wantedness Using All Schema Variables

Variables	<u>Prospective Wantedness</u>		<u>Retrospective Wantedness</u>		<u>Differences in Prosp vs Retro standardize coefs</u>		
	OR	Stand. Coef	OR	Stand. Coef	Difference	Ratio of Prosp/Retro	Larger For
<b>Race (vs. White)</b>							
Black	0.524*** (0.07)	-0.119	0.406*** (0.06)	-0.171	0.052	0.70	Retro
Other	0.490*** (0.09)	-0.079	1.077 (0.31)	0.008	-0.087	-9.88	Retro
<b><u>Prospective Schemas</u></b>							
<b>Children Intended in 79 (vs 2)</b>							
0	0.274*** (0.06)	-0.125	0.551* (0.14)	-0.059	-0.066	2.12	Prosp
1	0.375*** (0.07)	-0.105	0.831 (0.17)	-0.020	-0.085	5.25	Prosp
3	1.824*** (0.30)	0.099	1.770** (0.34)	0.097	0.002	1.02	Prosp
4	1.200 (0.17)	0.033	0.991 (0.17)	-0.002	0.035	-16.50	Prosp
<b>Parity (vs 2)</b>							
1	2.546*** (0.38)	0.192	1.814*** (0.24)	0.126	0.066	1.52	Prosp

144

	3	0.339*** (0.04)	-0.171	0.430*** (0.06)	-0.137	-0.034	1.25	Prosp
	4	0.178*** (0.03)	-0.206	0.257*** (0.05)	-0.167	-0.039	1.23	Prosp
<b>Retrospective Schemas</b>								
Age at Birth (vs teen-20)								
	21-24	1.000 (0.22)	0.00	3.088*** (0.58)	0.202	-0.202	0.00	Retro
	25-29	0.830 (0.19)	-0.036	2.684*** (0.56)	0.198	-0.234	-0.18	Retro
	30-35	0.362*** (0.09)	-0.190	2.897*** (0.67)	0.205	-0.395	-0.93	Retro
	36+	0.168*** (0.04)	-0.235	1.687* (0.44)	0.071	-0.306	-3.31	Prosp
	Enrolled at Birth	1.119 (0.30)	0.009	0.697 (0.18)	-0.030	0.039	-0.30	Retro
	Education at Birth (vs High School)							
	Less than High School	0.785 (0.12)	-0.039	0.922 (0.16)	-0.014	-0.025	2.79	Prosp
	Some College	1.145 (0.16)	0.023	1.068 (0.16)	0.012	0.011	1.92	Prosp
	College and above	2.881*** (0.61)	0.175	2.441*** (0.62)	0.152	0.023	1.15	Prosp
	Marital Status at Birth (vs Never Married)							

Job Satisfaction at Birth (vs Like A Lot)	Married	2.546*** (0.42)	0.172	5.263*** (0.89)	0.315	-0.143	0.55	Retro
	Divorced	1.411 (0.27)	0.042	1.617** (0.29)	0.061	-0.019	0.69	Retro
	No Job	1.060 (0.16)	0.012	1.348 (0.23)	0.062	-0.05	0.19	Retro
	Somewhat Like	1.019 (0.15)	0.004	0.824 (0.12)	-0.038	0.042	-0.11	Retro
	Dislike	0.773 (0.17)	-0.027	0.558** (0.12)	-0.062	0.035	0.44	Retro
BIC	2674.865		2614.296					
N	3875		3875					

Exponentiated coefficients  
 \* p<0.05 \*\* p<0.01 \*\*\* p<0.001

## References

- Bachrach, C.A. and S. Newcomer. 1999. "Intended pregnancies and unintended pregnancies: distinct categories or opposite ends of a continuum?" *Family Planning Perspectives* 5:251-252.
- Blei, D.M. and J.D. Lafferty. 2009. "Topic Models." <http://www.cs.princeton.edu/~blei/papers/BleiLafferty2009.pdf>.
- Brady, S.S., J.M. Tschann, J.M. Ellen, and E. Flores. 2009. "Infidelity, trust, and condom use among Latino youth in dating relationships." *Sexually Transmitted Diseases* 36(4):227-231.
- Campbell, A.A. and W.D. Mosher. 2000. "A history of the measurement of unintended pregnancies and births." *Maternal and Child Health Journal* 4(3): 163-169.
- Carley, K. 1994. "Extracting culture through textual analysis." *Poetics* 22:291-312.
- Carlson, M.J., S. McLanahan, and P. England. 2004. "Union formation in fragile families." *Demography* 41:237 - 261.
- Edin, K. and M.J. Kefalas. 2005. *Promises I can keep: Why poor women put motherhood before marriage*. Berkeley: University of California Press.
- Edin, K., M.J. Kefalas, and J.M. Reed. 2004. "A peek inside the black box: What marriage means for poor unmarried parents." *Journal of Marriage and Family* 67:1007-1014.
- Edin, K. and J.M. Reed. 2005. "Why don't they just get married? Barriers to marriage among the disadvantaged." *The Future of Children* 15:117-137.
- Ellwood, D.T. and C. Jencks. 2004. "The future of the family " Pp. 25 - 65, edited by D.P.M.L.R.T. Smeeding. New York: Russell Sage Foundation.
- Freeman, L.C. 1977. "A set of measures of centrality based on betweenness." *Sociometry* 40:35-41.
- Gibson-Davis, C.M. 2007. "Expectations and the economic bar to marriage among low income couples." Pp. 84 - 103 in *Unmarried couples with children* edited by P.E. England, K. . New York: Russell Sage Foundation.



- . 2011. "Mothers but not wives: The increasing lag between nonmarital births and marriage." *Journal of Marriage and Family* 73:264 – 278.
- Gibson-Davis, C.M., K. Edin, and S. McLanahan. 2005. "High hopes but even higher expectations: The retreat from marriage among low-income couples." *Journal of Marriage and Family*(67):1301 – 1312.
- Guimera, R. and L.A.N. Amaral. 2005. "Functional cartography of complex metabolic networks." *Nature* 24:895-900.
- Hamilton, B.E., J.A. Martin, and S.J. Ventura. 2010. "Births: Preliminary data for 2009 [online]." in *National vital statistics reports: National Center for Health Statistics*.
- Johnson-Hanks, J., C. Bachrach, S.P. Morgan, and K. Hans-Peter. 2010. "The Theory of Conjunctural Action." Pp. 11-47 in *Understanding Family Change and Variation: Structure, Conjuncture, and Action*.
- Joyce, T., R. Kaestner, and S. Korenman. 2002. "On the validity of retrospective assessments of pregnancy intention." *Demography* 39(1):199-213.
- Katz, B., J.D. Fortenberry, G. Zimet, M. Blythe, and D. Orr. 2000. "Partner-specific relationship characteristics and condom use among young people with sexually transmitted diseases." *The Journal of Sex Research* 37:69–75.
- Logan, C., H. E., M. J., and S. Ryan. 2007. "The Consequences of Unintended Childbearing: A White Paper." in *Child Trends*. 4301 Connecticut Avenue NW Suite 350, Washington, DC 20008.
- Luker, K. 1999. "A Reminder That Human Behavior Frequently Refuses To Conform to Models Created by Researchers." *Family Planning Perspectives* 31(5):248-249.
- Martin, J.L. 2002. "Power, Authority, and the Constraint of Belief Systems." *The American Journal of Sociology* 107:861-904.
- Maximova, K. and Q.-V. A. 2009. "Mental health consequences of unintended childlessness and unplanned births: Gender differences and life course dynamics." *Social Science & Medicine* 68(5):850-857.
- Mohr, J.W. 1998. "Measuring Meaning Structures." *Annual Review of Sociology* 24:345-370.

- Moody, J. 2001. "Peer influence groups: identifying dense clusters in large networks." *Social Networks* 23:261-283.
- Moody, J. and R. Light. 2006. "A View From Above: The Evolving Sociological Landscape." *The American Sociologist* 38:67-86.
- Morgan, S. and C. Bachrach. 2011. "Is the Theory of Planned Behaviour an appropriate model for human fertility?" *Vienna Yearbook of Population Research* 9:11-18.
- Pleck, J.H., F.L. Sonenstein, and S.O. Swain. 1988. "Adolescent males' sexual behavior and contraceptive use: Implications for male responsibility." *Journal of Adolescent Research* 3:275-284.
- Porter, M.A., J.P. Onnela, and P. Mucha. 2009. "Communities in networks." *Notices of the American Mathematical Society* 56:1082-1097 & 1164-1166.
- Quinn, K.M., B.L. Monroe, M. Colaresi, M.H. Crespín, and D.R. Radevk. 2006. "An Automated Method of Topic-Coding Legislative Speech Over Time with Application to the 105th-108th U.S. Senate."
- Ryder, N.B. 1973. "A critique of the National Fertility Study." *Demography* 10(4):495-506.
- . 1976. "The specification of fertility planning status." *Family Planning Perspectives* 8(6):283-289.
- . 1979. "Consistency of reporting fertility planning status." *Family Planning Perspectives* 10(4):115-128.
- Ryder, N.B. and C.F. Westoff. 1969. "Fertility planning status: United States, 1965." *Demography* 6(4):435-444.
- Ryder, N.B. and C.F. Westoff. 1971. *Reproduction in the United States 1965*. Princeton: Princeton University Press.
- Ryder, N.B. and C.F. Westoff. 1972. "Wanted and unwanted fertility in the United States: 1965 and 1970." Pp. 467-488 in *Demographic and Social Aspects of Population Growth*, edited by J. Charles F. Westoff and Robert Parke. Washington, D.C.: U.S. Government Printing Office.
- Santelli, J.R., K. Rochat, B.C. Hatfield-Timajchy, K.C. Gilbert, R. , J.S. Cabral, L.S. Hirsch, and U.P.W. Group. 2003. "The measurement and meaning of unintended pregnancy." *Perspectives on Sexual and Reproductive Health* 35(2):94-101.

- Santelli, J.S., A.C. Kouzis, D.R. Hoover, M. Polacsek, L.G. Burwell, and D.D. Celantano. 1996. "Stage of behavior change for condom use: The influence of partner type, relationship and pregnancy factors." *Family Planning Perspectives* 28:101–107.
- Santelli, J.S., L.D. Lindberg, M.G. Orr, L.B. Finer, and S. I. 2009. "Toward a multidimensional measure of pregnancy intentions: Evidence from the United States." *Studies in Family Planning* 40(2):87-100.
- Sewell, W.H. 1992. "A Theory of Structure: Duality, Agency, and Transformation." *American Journal of Sociology* 98:1-29.
- Trussell, J., B. Vaughan, and J. Stanford. 1999. "Are all contraceptive failures unintended pregnancies? Evidence from the 1995 National Survey of Family Growth." *Family Planning Perspectives* 31(5):246-248.
- Ventura, S.J. and C.A. Bachrach. 2000. "Nonmarital childbearing in the United States, 1940–1999." Washington, DC: National Center for Health Statistics.
- Westoff, C.F. and N.B. Ryder. 1977a. *The Contraceptive Revolution*. Princeton: Princeton University Press.
- Westoff, C.F. and N.B. Ryder. 1977b. "The predictive validity of reproductive intentions." *Demography* 14(4):431-453.
- Williams, L. and J. Abma. 2000. "Birth wantedness reports: a look forward and a look back." *Social Biology* 47(3-4):147-163.
- Williams, L., J. Abma, and L.J. Piccinino. 1999. "The correspondence between intention to avoid childbearing and subsequent fertility: a prospective analysis." *Family Planning Perspectives* 31(5):220-227.
- Wolf, M. 1971. "Family Intentions." edited by O.o.P.C.a.S.S.S. Division. London: HMSO.
- Wolf, M.P., Sue. 1976. "Families five years on." edited by O.o.P.C.a. Surveys. London: Office of Population Censuses and Surveys. Population Statistics Division I.
- Zabin, L.S., G.R. Huggins, M.R. Emerson, and V.E. Cullins. 2000. "Partner effects on a woman's intention to conceive: 'Not with this partner'." *Family Planning Perspectives* 32(1):39-45.
- Zagorsky, J.L. and L. White. 1999. "NLSY79 User's Guide 1999." Ohio: U.S. Department of Labor and Center for Human Resource Research.

## Biography

Heather M. Rackin was born in South Florida. She attended the University of Central Florida and received a B.A. in Sociology and Anthropology in 2006. She continued her graduate studies at Duke University where she received her M.A. degree in Sociology.

While at Duke University, she co-authored her first article was with S. Philip Morgan, "A Half-Century of Fertility Change", that appeared in the Journal of Comparative Family Studies. Her second was also co-authored with Morgan and appeared in Population Development Review ("The Correspondence of U.S. Fertility Intentions and Behavior"). Her first lead-authored article (in collaboration with Christina Gibson-Davis) "The Role of Pre- and Postconception Relationships for First-Time Parents" appeared in the Journal of Marriage and Family.

She is currently a PARISS fellow at Duke's Social Science Research Institute. This is a prestigious interdisciplinary fellowship that brings together one student from each Social Science Department to work together to advance quantitative methods. Previously, she has been awarded the Vorsanger-Smith Scholar Award that recognizes overall excellence in the Sociology Department and is given to only one or two students a year.