Child Health and Early Childhood Family Environments in Fragile Families

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Abstract
To address barriers to children's development and families' social mobility, scholarship on social inequality has increasingly paid attention to the importance of child health. In this study we simultaneously consider implications of social disadvantage and children's health disparities. We use data from the Fragile Families and Child Wellbeing Study to: 1) examine variation in poverty and family structure during their early childhood years (age one through five), and 2) determine if children born in poor health are more likely to spend their early childhood years in family environments typified by poverty and fragile family structures. Using sequence analysis and multinomial regression, we demonstrate that not only are children in poor health more likely to be born into poor fragile families relative to their healthy peers, they also are more likely to remain in these types of families throughout early childhood.

Extended Abstract

Introduction

In order to effectively address barriers to children's development and future mobility it is crucial to understand the conditioning interplay of poverty and family structure throughout early childhood. Previous studies of social inequality have established that low socioeconomic status and family instability in early childhood are associated with a broad variety of poor outcomes, including child health (McLanahan and Percheski 2008; Chan et al. 2015). At the same time, studies of health disparities have found that poor child health leads to lower parental income and unstable family structures (Case et al. 2005; Loft 2011; Reichman et al. 2004). This study combines insights from these two literatures, and develops a longitudinal framework that simultaneously considers the interplay between social disadvantage and child health disparities.

While existing research has revealed important relationships between family socioeconomic status and family structure with regard to children's health outcomes, very little attention has been paid to the family environments of children born in poor health. What is more, most work examines socioeconomic status and family structure separately or at particular points in time. Such approaches impede a more comprehensive understanding of the types of family environments children born in poor health grow up in relative to their healthy peers. This paper moves beyond these challenges by 1) simultaneously examining the variation in poverty and family structure that children experience during their early childhood (age one through five), and 2) asking whether children born with poor health are more likely to spend their early childhood years in family environments typified by poverty and unstable family structures.

Our study adds to existing research in at least two ways. First, whereas extensive research has established that poverty and family structure during early childhood have implications for the wellbeing and opportunities of children and their families, no previous study has examined these two factors as trajectories and in concert. Second, our longitudinal conceptualization of family environments tells us, not only if less healthy children are more likely to be born into poor unstable families, but also whether they remain in less favorable family environments throughout early childhood.

Data and Method

Our analysis is based on the Fragile Families and Child Wellbeing Study (FFCWS), which is a population-based cohort study following approximately 5,000 children born between 1998 and 2000 in large U.S. cities. Because we are interested in poverty levels, family structure and transitions, the FFCWS is an ideal data source for our study due to its large oversample of children born to unmarried parents (3,600). Mothers were interviewed in the hospital shortly after the birth of the focal child with additional interviews when the focal child was age three, five, nine, and fifteen. For the purpose of this study we use data from the first four waves of interviews (birth to age five), and limit our sample to children born to mothers that were unmarried at the time of the focal child's birth and who participated in all four waves of interviews. In addition, as the vast majority of children reside with their mother we further reduce our sample by excluding mother-child dyads where the child does not reside with his/her biological mother. Our finalized analytical sample consists of 2,729 mother-child dyads[1].

Our analytical procedure consists of two steps. First, in order to simultaneously examining the variation in poverty and family structure that children experience during their early childhood years, we use sequence analysis to generate typological pathways of family environments with regard to poverty and family structure. Specifically, all possible configurations of poverty (poor vs. non-poor) and family structure (single mother vs. cohabiting mother vs. married mother) are examined when the focal child is one, three and five years old. This approach allows us to determine

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[1] Our sampling strategy will be explained and argued in detail in the full paper.

which configuration of poverty and family structure each child occupied at each of the three time points, and to connects these configurations over time in order to describe family environment pathways). Second, we use multinomial regression analysis to explicitly assess if children born with poor health, measured as low birthweight, are more likely to spend their early childhood years in family environments typified by poverty and fragile family structures. In short, we examine how children are sorted into each of the identified family environment pathways based on their health condition at birth. An overview of all possible configurations of poverty and family structure is available in Appendix A, and a list of all included measures used in our analyses is available in Appendix B.

Results
We find strong support for a model with five sequences, highlighting five different family environments pathways for children born to unwed mothers. Common for four out of the five identified family environment pathways (covering 89 percent of our sample) is the fact that mothers have a very low propensity for entering marriage at any of the three observed time points. The five identified family environment pathways are graphed in Figure 1 and summarized in Appendix C.

Results from our multinomial regression analysis reveal that indeed child health is not only associated with being born into a poor fragile family environment, it also is strongly associated with remaining in such a less favorable environment throughout early childhood. Results from the regression analysis are presented in Table 1 and discussed in terms of relative risk ratios. Relative to being in the "Married Mother" family environment pathway, low birthweight children are significantly more likely to grow up in families typified by the "Poor Single Motherhood" pathway (2.20) or the "Poor Fragile Family" pathways (2.56). These initial results remain robust after controlling for mother's characteristics at birth, including race, education, age at first birth, and number of children. In order to further investigate the magnitude of these differences, predicted probabilities are presented in Table 2. With covariates held constant at their means, low birthweight children hold a 7 percent greater probability of being in the Poor Single Motherhood pathway (.25 vs. .32) and an 8 percent greater probability of being in the Poor fragile family pathway (.17vs. .25) relative to children not born with low birthweight.

Study Limitations and Additional Work
One significant limitation to this study is the fact that we can't assess what is going on in-between waves of data collection, as we don't have complete relationship histories. Thus, it is possible that the number and types of family structures that these children experience is even higher than what is shown here. If that is the case, our analysis is a conservative picture of children's early family experiences. The same is true for poverty, as the economic hardship experienced by these families may be even more turbulent than presented here. In addition, we should note that our results only apply to children born to unmarried mothers living in urban areas.

We are currently finalizing our results in order to further flush out the implications of our study in the full paper. First we have started to replicate the results across a variety of child health measures including hospital nurses' assessment of general child health and mothers' report of the presence of disability or illness at birth. These analyses will help us to better understand exactly what it is about child health that is important. Along similar lines, and with the purpose of improving our regression analysis, we also plan to check for interaction effects in our models. Finally, we will employ an improved strategy for our cross-sample comparison of estimates for children born with poor health and children born with good health as suggested by Karlson, Holm and Breen (2012).

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Figures and Tables

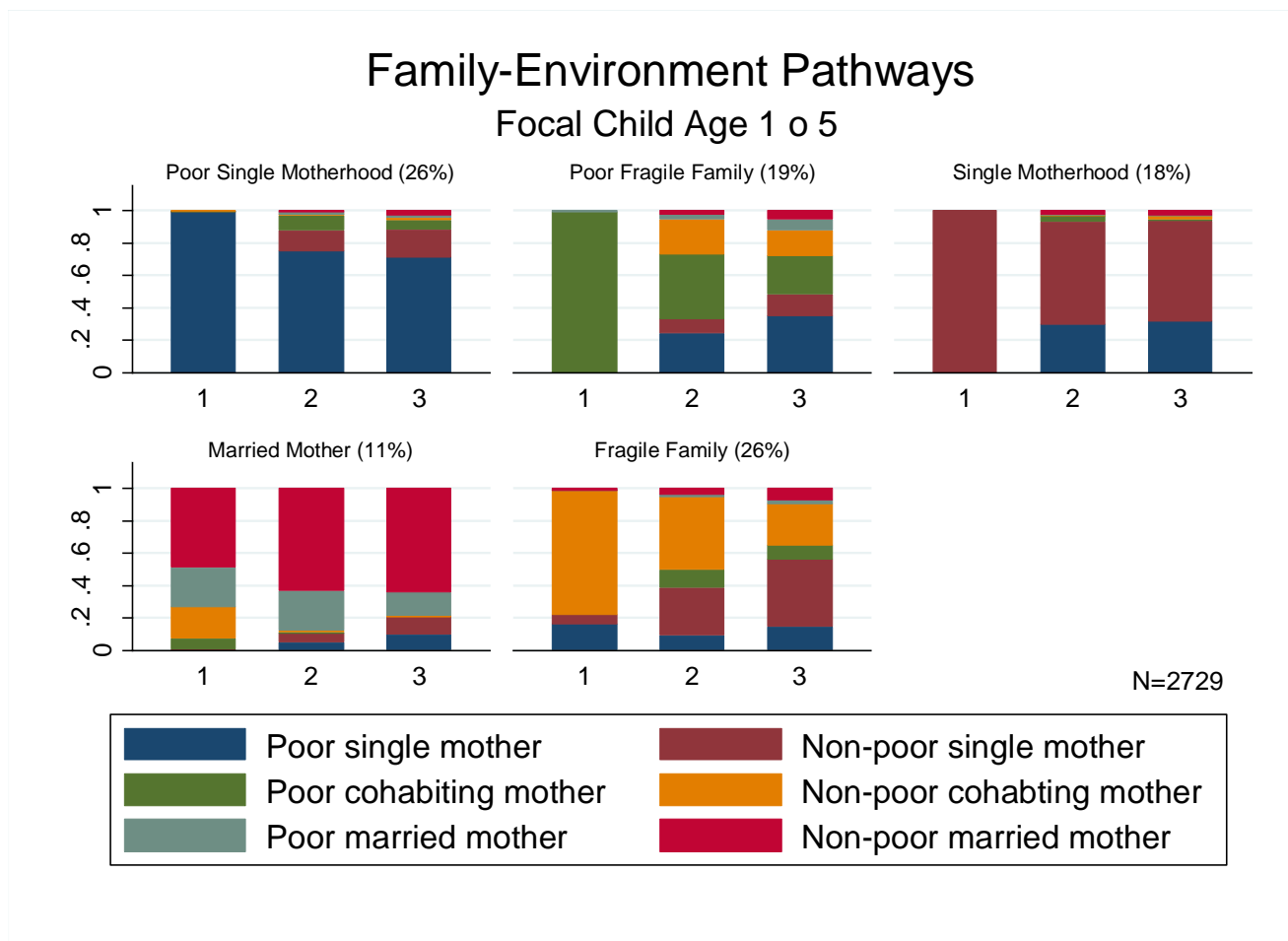Figure 1, Bar Graph of Identified Family Environment Pathways

Table 1, *Multinomial Logistic Regression Predicting Family Environment Pathway. Reference Pathway: "Married Mother". N=2,729*

Variables	Poor Single Mother			Poor Fragile Family			Single Mother			Fragile Family		
	B	*SE*	*RRR*	*B*	*SE*	*RRR*	*B*	*SE*	*RRR*	*B*	*SE*	*RRR*
Child Health												
Birthweight >=2500g (ref.)			1.00			1.00			1.00			1.00
Birthweight < 2500g	.79**	.25	2.20	.94***	.26	2.56	.29	.28	1.35	.38	.26	1.47
Control Variables												
#Mothers education												
Less than high school (ref.)			1.00			1.00			1.00			1.00
High school or equivalent	- .78***	.17	.46	-.68***	.18	.51	.12	.19	1.13	.18	.17	1.22
Some college, tech or more	- 1.40***	.19	.24	-1.47***	.21	.23	.41*	.19	1.51	.30	.18	1.34
#Siblings in household												
None (ref.)			1.00			1.00			1.00			1.00
One	.40*	.18	1.50	.41*	.19	1.51	.15	.18	1.16	.15	.17	1.16
Two or more	.83***	.18	2.30	.62***	.18	1.86	-.11	.18	.90	-.04	.17	.96
Constant		1.70			.95			.94			2.05	
χ^2						389.40						
df						28						
% in each typology		26.35			18.69			18.07			25.91	

Notes: Robust standard errors were used to correct for clustering within families (2,729 clusters). *RRR* = relative risk ratio. # Measured at the time of the focal child's birth. Model controlled for Mother's age at her first birth and mother's race (results no shown).
*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

Table 2, *Predicted Probabilities Derived from Multinomial Logistic Regression Estimates for Variables Predicting Family Environment Pathway Membership (N=2,729).*

	Poor Single Motherhood	Poor Fragile Family	Single Motherhood	Married Mother	Fragile Family
Predictor values					
Child Health					
Birthweight >=2500g	.25	.17	.18	.27	.12
Birthweight < 2500g	.32	.25	.14	.22	.07
Control Variables					
#Mothers education					
Less than high school	.37	.26	.11	.18	.08
High school or equivalent	.24	.17	.19	.28	.12
Some college, tech or more	.14	.10	.27	.27	.13
#Siblings in household					
None	.19	.15	.22	.31	.13
One	.26	.18	.18	.27	.11
Two or more	.33	.21	.14	.22	.10

Note: Probabilities are computed from estimates reported in Table 2. For each predictor value all other variables in the model are held constant at their means.

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Appendix A

Possible Configurations of Poverty and Family Structure

Poverty	Family Structure	Label
Poor	Single mother	Poor single mother
Non-poor	Single mother	Non-poor single mother
Poor	Cohabiting mother	Poor cohabiting mother
Non-poor	Cohabiting mother	Non-poor cohabiting mother
Poor	Married mother	Poor married mother
Non-poor	Married mother	Non-poor married mother

Appendix B

Included Measures

	VARIABLE	*MEASURE*	*ORIGIN*
Step 1: Sequence Analysis			
	Poverty	0 = poor, 1 = not poor	Mother survey at focal child age 1, 3, and 5. Constructed variable cm2povca, cm3povca, cm4pocva.
	Family Structure	0 = single, 1 = cohabiting, 3 = married	Mother survey at focal child age 1, 3, and 5. Constructed variables cm2marf, cm2cohf, cm3marf, cm3cohf cm4marf, cm4cohf
Step 2: Multinomial Regression			
Dependent variable	Family Environment	1 = poor single mother, 2 = poor fragile family, 3 = single mother, 4 = married mother, 5 = fragile family	Step 1, results from sequence analysis
Independent variable	Child health	0 = birthweight >2500g , 1 = birthweight <2500g	Mother survey at birth of focal child, variable cm1lbw. Medical records at birth of focal child. Variable chj15
Control variable	Maternal education	1 = less than high school, 2 = some high school or equivalent, 3 = tech, some collage, collage and more	Mother survey at birth of focal child. Constructed variable cm1edu.
Control variable	Siblings (including social siblings)	0 = no siblings in household , 1 = one sibling in household, 2 = two or more siblings in household	Mother survey at birth of focal child. Constructed variable cm1kids
Control variable	Mothers age at her first birth	Continuous measure (range 13-45)	Mother survey at focal child age 1. Constructed variable cm2bir
Control variable	Mother race	1 = white non-Hispanic, 2 = black non-Hispanic, 3 = Hispanic and other	Mother survey at birth of focal child. Constructed variable cm1ethrace

Appendix C

Description of the Five Identified Family Environment Pathways

Label	Description
Poor single mother (26%)	This family environment is distinctive for the high prevalence of poor single motherhood at all three time points. Only very few mothers move out of poverty by the children's third or fifth birthday. Children following this pathway through early childhood grow up in families that are continuously poor and without any residential father figure. This family-environment pathway is labeled 'Poor single motherhood' and 26 percent of our analytical sample belongs to this pathway.
Poor fragile family (19%)	This family-environment is distinguished by all mothers being poor cohabiting mothers when the focal child is 1 year old. Although there is some propensity for these mothers to remain cohabiting at each time point - or even move to a state of non-poor cohabitation as the child ages, there is a relatively high likelihood for these mothers to be single mothers and to be poor single mothers by the focal child's fifth birthday. Children in this pathway experience a family-environment dominated by a high risk of parental breakup and poor circumstances. This family-environment pathway is labeled 'Poor fragile family' and account for 19 percent of our analytical sample.
Single mother (18%)	This family-environment mirrors in many ways the 'Poor single motherhood'. That is, this family-environment is also distinctive for the high prevalence of single motherhood at all three time points. Yet, the mothers in this pathway start out as non-poor and with a high likelihood of remaining so. Nonetheless, whereas some (few) mothers in the 'Poor single motherhood' pathway may move out of poverty, children in this pathway have mothers with some propensity of moving from being non-poor single mothers to become poor single mothers by the child's third and fifth birthday. This family-environment pathway is labeled 'Single motherhood' and 18 percent of our analytical sample follows this pathway.
Married mother (11%)	This family-environment pathway is highly characterized by mothers being married. Mothers in these families start out with a high likelihood of being non-poor and married, or alternatively being poor married or non-poor cohabiting. As children in this pathway ages, cohabitation is diminishing and families with non-poor married mothers dominate this pathway. There is only a very small propensity – although increasing over time –for mothers to be single at the observed time points. This family-environment pathway is labeled 'Married mothers' and 11 percent of our analytical sample are to be found in this pathway.
Fragile family (26%)	This family-environment pathway is typified by non-poor mothers starting out in cohabiting relationships. Yet, similar to the 'Poor fragile family' pathway, the presence of a father figure in the household diminishes as the child ages moving families in this pathway towards single motherhood. This family-environment pathway is labeled 'Fragile family and 26 percent of our analytical sample are to be found in this pathway.