

NONSTANDARD WORK AND COGNITIVE AND BEHAVIORAL DEVELOPMENT
AMONG PRESCHOOL CHILDREN IN SINGLE MOTHER FAMILIES

BY

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THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Science in Human and Community Development
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2012

Urbana, Illinois

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Abstract

This study investigates the relationship between nonstandard work schedules and children's cognitive, social, and behavioral development in single mother families, as well as the impact that parental stress and depression may have on children's outcomes. Multivariate analyses were conducted using data from the Early Childhood Longitudinal Study- Birth Cohort (ECLS-B). Results indicate that children of single mothers who work nonstandard hours have worse cognitive outcomes compared to children whose mothers work standard hours. This effect persists after controlling for job, maternal, child, and family characteristics. Little support is found for the notion that parenting stress and maternal depression are the main mechanisms linking nonstandard work with poorer cognitive outcomes among preschool age children of single mothers. In addition, this study finds that single mothers who work nonstandard shifts are more likely to have children who are experiencing greater internalizing behavioral problems. Working a nonstandard job is not associated with preschool children's externalizing behavior problems. Mothers who are depressed have higher levels of parental stress which negatively affects their children's externalizing behavior. These findings highlight the importance of further examining the relationship between nonstandard work and child well-being and possible pathways through which nonstandard hours affect children's outcomes. More attention needs to be paid to single mothers work conditions, particularly nonstandard work, as well as the mental health and well-being of single mothers as they strive to adequately care for their children and work enough hours to support them financially.

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Chapter One: Introduction

Today, we live in a “24/7 economy” with a significant portion of the U.S. labor force working evenings, nights and weekends. Single mothers with young children are more likely to work in service sector jobs often characterized by these kinds of nonstandard work schedules, lower wages and fewer benefits (Daniel, Grzywacz, Leerkes, Tucker, & Han, 2009; Han, 2005; Presser, 2003). Balancing the competing needs of work and family life is a challenge for most households, but it may be greatest for these working mothers as they struggle to find sufficient time to fulfill work responsibilities and provide the care that young children require for healthy development (Waldfogel & McLanahan, 2011). While numerous studies have examined the impact of family structure, employment status and number of hours worked on a variety of cognitive and behavioral outcomes in children and adolescents (Amato, 1993; Cooksey, Menaghan, & Jekielek, 1997; Parcel, Nickoll, & Dufur, 1996; Rogers, Parcel, & Menaghan, 1991), less attention has been paid to the effects of work schedules on maternal health and parenting experiences, particularly within the context of single mother families with young children (Han, 2005; Lleras, 2008a). This is important given the number of single mothers working nonstandard hours and the added strains they are likely to encounter as they parent young children. The overall goal of this study is to examine the relationship between nonstandard work schedules and children’s well-being in single mother families as well as to explore possible pathways including parental stress and depression, through which work schedules may influence children’s outcomes.

While some studies have shown negative effects of shift work on adult well-being and stress levels (Strazdins, Shipley, Clements, Obrien, & Broom, 2010) more recent research on nonstandard work schedules in two parent families has suggested there could be positive effects on parenting experiences as well (Barnett & Gareis, 2007; Gassman-Pines, 2011; Hseuh & Yoshikawa, 2007). While little is known about how nonstandard work may impact single mother’s emotional well-being and parenting experiences, specifically (Han, 2006; Lleras, 2008a), some studies suggest that shift work may make single mother families more vulnerable to life stressors, specifically accessing social support, time management, and financial challenges (Copeland & Harbaugh, 2010; Costa, 2003; Presser, 2000). Since single mothers are often primarily responsible for meeting the emotional, cognitive, and physical needs of their children,

it is important to understand how work conditions including nonstandard work schedules may impact their ability to care for their children (Lleras, 2008a).

Preschool is an important time in children's cognitive, emotional and social development. It is during this time period that children develop and cement many of the skills and behaviors needed for a smooth transition to formal schooling (Farkas, 1996). A child's ability to regulate his or her emotions, pay attention, and persist in the face of a difficult task has been shown to be as important as cognitive ability in determining educational success (Konold & Pianta, 2005; Lleras, 2008b; Tach & Farkas, 2006). Therefore, this study will examine not only the impact that working nonstandard schedules may have on children's cognitive skills but their socioemotional and behavioral development as well. Utilizing longitudinal data from a national sample of employed single mothers from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), this study will examine two main questions. First, are maternal nonstandard work schedules related to children's cognitive, social and behavioral development during the preschool years? And, two does parental stress and maternal depression mediate the relationship between maternal nonstandard work schedules and child well-being?

Chapter Two: Literature Review

Maternal Work and Single Mother Families

Over the second half of the twentieth century, family life in the U.S. changed dramatically in two important ways: the entrance of women into the labor force, especially of women with young children, and the increase in single mother families. Between 1975 and 2009, the labor force rate of mothers of children under the age of six, rose from 39.0 percent to 63.6 percent (Bianchi, 2011). During the same time period, divorce rates and the proportion of births to unmarried women have also risen sharply, resulting in a dramatic increase in the number of children being raised by a single mother. Today, about one quarter of all U.S. children are in a household headed by a single mother and it is estimated that about one in two children will reside in a single parent household before they reach the age of eighteen (U.S. Census Bureau, 2010). Studies have shown that single mothers have as many child related demands as their married counterparts do, but only have half of the adults to meet such demands which can lead to greater tension between their paid work and family caregiving responsibilities (Hseueh & Yoshikawa, 2007; Joshi & Bogan, 2007). Additionally, single mothers are also at a greater risk of experiencing economic hardship, which poses an additional strain on their families.

Research shows that poverty rates are much higher for single mother families than for other households. In 2010, there were 14.2 million poor single mother families, 11.2 million poor married couple families, and 2.3 million poor single father families. In addition, racial minority single mothers are at an even higher risk of living in poverty. Certainly the main reason single mother households are more likely to be impoverished is because two earners can usually contribute more income to the household (Presser, 2000, 2003). However, research also points to single mothers increasing concentration in low end service sector jobs which are often accompanied by low wages, few if any, benefits and unpredictable work schedules and work hours (Presser 1999, 2000, 2003, 2004).

The nature of employment in the U.S. is becoming increasingly diverse as a result of changes in technology, consumption patterns, access to global markets, and growth in services (Sparks, Faragher, & Cooper, 2001). Nowadays, businesses operate on a "24/7 economy" (Presser, 1999, 2003, 2004). The standard full-time workweek is typically considered to be thirty-five to forty hours, Monday through Friday, mostly during the day. Approximately one in five American workers, however, now work more than half of their hours outside the standard 8:00 am to 4:00

pm hours, work a rotating schedule, or varying work hours (Bianchi, 2011; Presser, 1999, 2004). Women are overrepresented in these kinds of jobs such as—cashiers, retail, hospital, personal services, and wait staff, that disproportionately comprise the 24/7 economy (Presser, 1999, 2003, 2004). Perhaps even more importantly, single mothers are more likely to work nonstandard hours and to work longer hours compared to married mothers. In addition, workers in service sector jobs are not only likely to have lower earnings, but are also less likely to receive benefits such as health insurance, paid vacation, or holidays (Douglas-Hall, & Chau, 2007; Strazdins, Korda, Lim, Broom, & D’Souza, 2004).

Maternal Work Schedules and Child Development

Prior research on parental work and child development has often focused on maternal employment and specifically, the age of children when mothers enter the labor force and the number of hours worked (i.e., part-time versus full-time) (Barnett & Gareis, 2007; Brooks-Gunn, Han, & Waldfogel, 2010; Han, 2005, 2006, 2008). Despite the increasing prevalence of nonstandard schedules among working parents, less attention has been paid to how parents' participation in nonstandard work may be related to children's cognitive and socioemotional development (Presser, 2000). Of the studies that have examined the impact of parental work schedules most have focused on dual earner families or households with either very young children (under three years old) or adolescents (Barnett, 2006; Brooks-Gunn et al., 2010; Daniel et al., 2009; Goldberg, Prause, Lucas-Thompson & Himsel, 2008; Han, 2005, 2006; Lucas-Thompson, Goldberg, & Prause, 2010; Repettie, 2005; Waldfogel, 2007).

In general, studies have found a negative relationship between nonstandard hours and very young children's cognitive and emotional development and behavioral problems among adolescents (Han, Miller, & Waldfogel, 2010; Han & Waldfogel, 2007). In a study using data from the National Institute of Child Health and Human Development Study of Early Child Care, Han (2005) examined the association between mothers' work schedules and children's cognitive outcomes in the first 3 years of life. These results showed a negative relationship between nonstandard schedules and children's cognitive outcomes, particularly during the first year of life. In addition, evidence from cross-sectional (Joshi & Bogen, 2007; Strazdins, Clements, Korda, Broom, & D’Souza, 2004, 2006) and longitudinal studies (Daniel et al., 2009; Rosenbaum & Morett, 2009) have consistently suggested that very young children in dual-earner families with at least one parent working nonstandard hours have more behavioral problems than

those with no parent working nonstandard hours. In one study based on a sample from Canada, researchers found that children two to three years old were more likely to have social and emotional difficulties when their mother or both parents worked nonstandard hours compared to children of both parents working standard hours (Strazdins et al., 2006). This study suggested that at least part of the association between nonstandard hours and children's emotional difficulties was due to heightened parental depression and parenting behaviors. In a small cross-sectional study utilizing data from the Welfare, Children and Families Study in the U.S., Joshi and Bogen (2007) found that children of low-income mothers who usually worked a nonstandard schedule experienced more internalizing and externalizing problems and exhibited fewer positive behaviors compared to children of low-income mothers who worked standard hours. Like the study from Canada, they also found at least some of the effects of working nonstandard schedules on child outcomes were mediated through increased parenting stress.

Research has also shown that parental nonstandard work may affect children's behavior during middle childhood and the adolescent years. Adolescence is an important developmental stage where young people begin engaging in risky health behaviors (i.e. smoking, drinking, and sexual deeds). Thus, parental supervision and monitoring may be just as important as it is in early childhood. Studies on the impact of maternal work schedules on adolescent well-being have generally shown that the number of years a parent works nonstandard hours has a direct negative association with adolescent mental health. Han (2006) found that behavioral problems among four to ten year old children increased with the number of years that mothers had worked a nonstandard schedule. Results from this study also showed that children between six and eleven years old whose mothers worked nonstandard hours had significantly lower school engagement than did children whose mothers worked standard hours. Han and Waldfogel (2007) looked at a sample of ten to fourteen year olds to examine whether mothers' and fathers' work schedules were associated with parental monitoring and adolescent-parent closeness. Their results suggest that for two-parent families, parental nonstandard work schedules have mixed associations with measures of family processes, tending to improve monitoring but also have some deleterious effects on reported closeness.

Some research on maternal work and child development has included single mothers but these studies most often compare number of hours worked among single and married mothers with little attention paid to examining the variation among single working mothers or the issue of

nonstandard work hours (Gassman-Pines, 2011; Joshi & Bogan, 2007; Strazdins et al., 2006). National surveys show that single mothers with low levels of education are disproportionately overrepresented in these less skilled and service sector jobs that are likely to require nonstandard schedules or variable shifts (Hsueh & Yoshikawa, 2007). A handful of studies have compared the effects of working nonstandard hours on children's outcomes between single and married mothers. Han (2008) found that the number of years mothers worked a non-day shift was associated with more behavioral problems among children (four to ten years old) who lived in single mother families compared to those living in two-parent families. Other studies have also shown that when compared to working standard schedules, U.S. single mothers working a rotating shift was associated with a greater likelihood their 10-14 year old children had ever engaged in criminal behavior or had school-related troubles (Han & Waldfogel, 2007).

Work Schedules, Parenting Behavior, and Maternal Well-Being

Children's well-being is fostered by close and positive parent-child relationships, which are usually fostered and enhanced through parents spending time with their children (Strazdins et al., 2006). However, to provide the convenience of a growing 24/7 economy, employees often find themselves working hours outside of regular daytime hours when many children are either in daycare or school. A shift schedule is not only likely to reduce the amount of time parents can spend with their children, but also the amount of physical and mental energy parents have to cultivate positive relationships with their children (Presser, 2003). Parental nonstandard work may thus have direct associations with the quality of parent-child relationships by increasing parenting stress and anxiety.

Whereas some studies have reported that dual-earner families develop strategies to fit child care and family interaction around job schedules, increasing rather than reducing supervision and parent-child interaction, single parent households may not experience the same benefits. Studies have shown that single mothers working nonstandard hours spend less time with children in cognitively supportive and stimulating activities, such as less time reading, playing, and helping their children with school-work (La Valle, Arthur, Millward, Scott, & Clayden, 2002; Lleras, 2008a; Strazdins et al., 2004; Wight, Raley, & Bianchi, 2008;). In a small sample of low-income mothers with preschool children, Gassman-Pines (2011) found that the number of hours low-income mothers worked at night time was associated with fewer cognitively stimulating activities, as well as higher levels of harsher and withdrawn interactions with their children.

The stress and fatigue caused by working nonstandard hours may also affect parenting responsiveness and sensitivity towards their children. Using longitudinal data from the NICHD, Grzywacz and colleagues (2011) examined maternal sensitivity and the home environment, suggesting that mothers who worked a nonstandard schedule during the first year of the child's life had poorer maternal sensitivity at 24 and 36 months. These findings suggest that maternal nonstandard employment in the child's first year may impair parenting practices that promote healthy child development. Not only may nonstandard work schedules leave mothers physically and emotionally exhausted and less able to interact with their children in a developmentally generative way, thereby creating an opportunity for poorer child development outcomes (Daniel et al., 2009; Han, 2005; Strazdins et al., 2006) but working nonstandard hours may also affect family routines. Young children, compared to older children may be more sensitive to any disruptions in routines and may be more reactive to parents' irritability and inconsistent parenting, leading to lower school achievement and more externalizing problems (Hsueh & Yoshikawa, 2007; Presser, 2003). In one study, Rosenbaum and colleagues (2009) found that nonstandard work hours decrease family meals and are associated with difficulties scheduling family activities and spending with family members.

Most studies of maternal employment and nonstandard work specifically, have compared working single and married mothers. An exception to this is the study by Lleras (2008a) who utilized data from the National Longitudinal Study of Youth (NLSY) to examine the impact of working nonstandard hours on the quality of the home environment provided by single mothers of preschool children. Her results showed that single mothers who worked nonstandard hours including evening, nights or split shifts had poorer home environments compared to single mothers who worked the regular dayshift. While this study did not examine how nonstandard hours affect child development specifically, the study highlighted the importance of examining how employment conditions may impact within group differences in the quality of parenting experiences and ultimately, child well-being among single working mothers.

Within married or single-family households, parenting is a challenging process. Single parents may have as many child demands on their time as married parents, but their household only has half as many adults to meet those demands (Waldfogel & McLanahan, 2011). Adding to already stressful family demands, research has shown that single mothers are more likely than married mothers to work at nonstandard times and to work longer hours (Presser, 2000).

Numerous empirical studies have found negative effects of working nonstandard hours on adults' psychological, physical, and emotional well-being (Costa, 2003; Presser, 2000, 2003, 2004). For example, regular night shifts and rotating shifts disturb the body's circadian rhythms, alter physiological functions, and potentially lead to chronic health conditions, anxiety, neurotic disorders, depression, and chronic sleep deprivation and fatigue (Barnett & Gareis, 2007; Totterdell, 2005; Ulkher, 2006). Finally, research has also supported a strong relationship between the work environment and the experience of maternal role strain. Work characteristics that provide support and options for women typically relate to lower levels of role strain, whereas work characteristics that designate greater job demands (i.e. nonstandard hours) are linked with higher strain and stress (Morris & Coley, 2004). The stress associated with nonstandard work may lead to less positive family dynamics such as more work-family conflict (Barnett, Gareis, & Brennan, 2008), especially for single mothers in view of the fact that they are both the primary caretaker of their children and main source of family income (Lleras, 2008a). In light of prior research linking nonstandard work to parenting stress and emotional well-being this study will examine whether parenting stress and maternal depression mediate the relationship between nonstandard hours and child development among single working mothers of preschool age children.

Chapter Three: Current Study

This study seeks to contribute to the large literature examining the impact of maternal work on various aspects of child development (Brooks-Gunn et al., 2010; Daniel et al., 2009; Han, 2005, 2006, 2008; Waldfogel, 2007) by focusing on one central aspect of employment, nonstandard work schedules, and how these schedules influence healthy child development in single mother families. I focus on nonstandard work among single working mothers for two main reasons. First, nonstandard work hours have been increasing over the past few decades and research has shown these hours to be related to poorer child outcomes (Daniel et al., 2009; Han, 2006, 2008; Presser, 1999, 2003, 2004; Rosenbaum & Morett, 2009). Second, single mothers are more likely to work nonstandard hours compared to married mothers and studies suggest that working these kinds of hours may be particularly harmful for younger children (Daniel et al., 2009; Han, 2005, 2006; Heymann, 2000; Gassman-Pines, 2011; Strazdins et al., 2004; Strazdins et al., 2006). This study will fill in a gap in prior work by examining not only whether nonstandard work hours are associated with poorer cognitive and behavioral development among preschool children in single mother families but also by assessing the extent to which parenting stress and maternal depression may mediate this relationship. Some prior research has suggested that increased stress and depression may indeed explain the negative association between nonstandard schedules and child outcomes (Joshi & Bogen 2007; Strazdins et al., 2006), but this has never been examined within the context of single mother families. Moreover, when mothers work nonstandard hours, evidence has shown that it contributes to depressive symptoms via fatigue and disruption of biological systems (Costa, 2003; Presser, 2000, 2003, 2004; Strazdins et al., 2006). Depressed parents as well as stressed parents have been found to be less spontaneous, more withdrawn, angry, and sad (Strazdins et al., 2006), impacting parent-child relationship, leading to more irritable and hostile interactions with their children, and possibly increasing work-family conflict (Gershoff, Aber, Raver, & Lennon, 2007; Barnett & Gareis, 2007). This study will determine whether nonstandard work is associated with cognitive, socioemotional and behavioral development at preschool within single working mother families. And if so, whether maternal depression and parenting stress mediate the relationship between nonstandard work and child outcomes.

Chapter Four: Data and Method

Data

This study utilizes data from the second and third waves of the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). The ECLS-B is a nationally representative sample collected by the National Center for Education Statistics, of approximately 14,000 children born in the U.S. in 2001. The children are from racially/ethnically and socioeconomically diverse backgrounds and have been followed from birth through kindergarten entry. Information was collected from parents, childcare providers, teachers, and through child assessments on children's cognitive, social and emotional development, as well as parental work conditions, mother's emotional well-being and parenting experiences.

The sample for this study includes children from the birth cohort who participated in the second wave of data collection (2003-2004) when children were approximately 24 months old and the third wave of data collection (2005-2006) when the children were approximately four to five years old or one year away from kindergarten. The sample includes only preschool age children who lived in single mother households at the time of the third follow-up survey. These households were identified using a variable in the ECLS-B parent survey, which asked the current marital status of the respondent. Children whose mothers responded that they were not currently married and were divorced, widowed or had never married were included in the sample. Since the goal of this study is to examine how nonstandard work impacts child development, single mothers who indicated they were not currently employed (worked during the past week) in the third follow up survey were excluded from the analysis. These criteria yielded a final sample of 868 preschool age children in single mother households in which the mother is currently employed in the labor force. To retain the sample size needed to perform adequate significance tests and interactions, all missing values were imputed using multiple imputation commands available in STATA 12.

Variables

Table 1 presents the means, standard deviations, and descriptions of all of the variables used in the analysis.

Table 1
Descriptive Statistics for All Variables in the Analysis of All Working Single Mothers of Preschool Age Children (N= 868)

Variables	Description	Range	Mean	SD	Cronbach's alpha
<i>Dependent Variable</i>					
Cognitive Development					
Early Literacy	IRT- estimated scale score includes 37 items representative of emergent literacy: letter recognition (8items); letter sounds (6items); early reading (4 items); phonological awareness (10 items); knowledge of print conventions (8items) matching word (1item).	(5.44-34.67)	11.73	6.18	
Math ability	IRT- estimated scale score includes 45 items: number sense (10 items); geometry (9items); counting (14 items); operation (8items); patterns (4items).	(5.75-41.03)	20.53	6.87	
Behavioral and Socioemotional Development					
Externalizing Behavior Problems	Scale of 7 items; parent reported whether each behavior has been observed (i.e. child is aggressive, child is angry, child is impulsive).	(0-26)	9.94	4.61	.80
Internalizing Behavior Problems	Scale of 12 items; parent reported whether each behavior has been observed (i.e. child shares, child volunteers, child makes friends).	(8- 44)	29.64	5.83	.80
<i>Independent Variable</i>					
Work hours/shift Description					
Nonstandard work	1= Nonstandard (includes evening shift, night shift, rotating shift, flexible hours); 0=regular day shift.	(0-1)	.291	.454	

Table 1 (continued)

Descriptive Statistics for All Variables in the Analysis of All Working Single Mothers of Preschool Age Children (N= 868)

Variables	Description	Range	Mean	SD	Cronbach's alpha
<i>Control Variables</i>					
Family Characteristics					
Family Size	Total number of people in the household under 18	(1 -8)	2.20	1.16	
Family Poverty	Children living in households with incomes below the 100% poverty threshold, by household size and income category 1=Below poverty thresholds; 0= at or above poverty threshold	(0-1)	.43	.49	
Maternal Age	Total age (in years)	(1 -49)	28.80	1.16	
Maternal Education	Highest education level attained, ranging from less than a high school diploma to a masters or professional degree and beyond. Less than h/s= 1	(1-5)	2.44	.930	
Maternal Race/Ethnicity	African American		.391	.488	
	Hispanic		.183	.387	
	Other		.108	.310	
	White (reference category)		.316	.465	
Child sex	1 = Male		.503	.500	
Child age	Total age (in months)	(44.2-64.36)	53.39	.430	

Table 1 (continued)

Descriptive Statistics for All Variables in the Analysis of All Working Single Mothers of Preschool Age Children (N= 868)

Variables	Description	Range	Mean	SD	Cronbach's alpha
<i>Two-Year Child Development</i>					
Vocabulary	Score includes 50 items; parent report measure of children's vocabulary using the M-CDI of whether child could say target word; child says meow, beat, hat, cat.	(0-50)	27.14	11.75	.95
Communication Skill	Scale score includes 6 item; parent report measure of children's morphological and syntactic development; has child begun to combine words, child adds "ing".	(1-9)	4.42	2.11	.74
Behavior	Scale score includes 11 items; interviewer observations of the child's behavior during the BSF-R: child shows interest in material, child is persistent in tasks, child cooperates.	(6-37)	23.56	5.05	.90
<i>Additional Control Variables</i>					
<i>Job Characteristics</i>					
Full-Time	Usual number of hours worked per week; 1= Fulltime (36-40 hrs.) 0=low part-time (1-20), part-time (21-35) and more than 40 hours.	(0-1)	.520	.499	
Work Benefits	1= Eligible, 0=job does not offer and/or not eligible	(0-1)			
	Medical Insurance		.611	.487	
	Sick Leave		.507	.500	
	Childcare assistance		.084	.278	
	Flexi-plan		.472	.499	
	Dental plan		.525	.499	

Table 1 (continued)

Descriptive Statistics for All Variables in the Analysis of All Working Single Mothers of Preschool Age Children (N= 868)

Variables	Description	Range	Mean	SD	Cronbach's alpha
<i>Mediating Mechanisms</i>					
Maternal Depression	Dichotomous variables created from 12 items; CES-D scale score; self-reported; parents responded rarely or never, some or a little, occasionally or moderately, most or all if they felt like not eating, fearful, sad 1= Moderate/Severe Depressive Symptoms 0= Non/Mild Depressive Symptoms.	(0-1)	.254	.436	.88
Parenting Stress	Scale of 5 items; parents reported on whether or not they felt trapped by their responsibilities, being a parent is hard, giving up more for child's needs than expected.	(5-20)	10.34	3.42	.77

Cognitive abilities. The assessments of early literacy and math ability given to preschool children during the third follow-up survey were used to measure cognitive abilities. The preschool emergent literacy assessment is designed to measure overall literacy knowledge and skills and contained 37 items including: letter recognition, in both receptive and expressive modes (8 items); letter sounds (6 items); early reading— recognition of simple words (4 items); phonological awareness (10 items); knowledge of print conventions (8 items); and matching word (1 item). The preschool math assessment was designed to measure overall math skills and proficiency in numbers and shapes and included 45 questions in the following content areas: number sense (10 items); geometry (9 items); counting (14 items); operation (8 items); and patterns (4 items).

The overall scale score for literacy knowledge and skills and math were constructed in the ECLS-B using item response theory (IRT). Although both assessments were adapted to the child such that not all children received all items (difficulty of items is adjusted based on correctness of response), the IRT procedures make it possible to calculate scores that can be compared regardless of which assortment of items a child received using patterns of correct and incorrect responses. The IRT scale scores estimate the number of items children would have answered correctly if they had received all of the scored questions in a given content domain.

Behavioral and socioemotional development. During Wave 3, the ECLS-B included the Preschool and Kindergarten Behavior Scales-Second Edition (PKBS-2) in the interviews with the child's primary caregiver. The PKBS-2 is designed to measure problem behaviors and social adjustment in children (Merrell, 2002). The 24 items asked parents how frequently the child acted in certain ways. To measure Externalizing Behavior, I utilized 7 items which tapped into aggressive and disruptive behavior. These items included caregiver reports of how often their child was aggressive, angry, impulsive, overly active, prone to temper tantrums, annoys other children, and destroyed things. Responses to each item were coded such that higher scores reflected increased levels of behavior problems (i.e., 0 = never, 1 = rarely, 2 = sometimes, 3 = often, and 4 = very often). These 7 items were summed to create the *Externalizing Behavior Problems scale*.

To measure Internalizing Behavior, I utilized 12 items which tapped into prosocial skills and emotional knowledge and development. These items included caregiver reports of how often the child invites other children to play, volunteers, is liked by others, shares, is unhappy, is

comfortable, uses words to express feelings, is worried, is invited to play by others, stands up for others rights, understands, and makes friends easily were used. Responses to each item were coded such that higher scores reflected worse socioemotional functioning. These 12 items were summed to create the *Internalizing Behavior Problems scale*.

Nonstandard work schedules. The key independent variable in this study is nonstandard work schedules (or hours). To measure nonstandard work hours, mothers were asked which of the following best described the hours usually worked at her main job: regular daytime shift—any time between 6 A.M. and 6 P.M.; regular evening shift—any time between 2 P.M. and Midnight; regular night shift—any time around 9 P.M. and 8 A.M.; rotating shift—one that changes periodically from days to evenings or nights; split shift—one consisting of two distinct periods each day; and other shift— one consisting of varied hours. The majority of single mothers in the sample reported working the regular dayshift (70.8 percent). Due to the small sample size, there were not enough cases in several of the categories to conduct meaningful analyses using dummy variables for each of the shifts (i.e., approximately 52 single mothers worked the night shift; 8 worked the split shift). Therefore, I constructed a dummy variable, *Nonstandard work*, to identify whether or not mothers worked any nonstandard shift (evening, night, rotating, split, other =1; regular dayshift=0).

Control variables. To better isolate the effects of nonstandard work on preschool children's cognitive, behavioral and socioemotional development, I include a number of child and family characteristics, a cognitive and behavioral assessments collected at Wave 2 (24 months), as well as job characteristics that might be correlated with nonstandard schedules and the child outcomes. The child and family characteristics include family size, family poverty, maternal age, maternal education, maternal race/ethnicity, child's sex and child's age. Family size was measured by the total number of people in the household under 18, including focal child, parents, siblings or other children. Family poverty was measured by using a dichotomous variable, where 0 represented children living in a household with incomes at or above the 100% poverty threshold and 1 represented children living in households with incomes below the 100% poverty threshold. Maternal age is measured in total number of years, ranging from 19 to 49. Highest education level attained by the mother is a continuous variable ranging from less than high school to master's degree and beyond. Three dummy variables were constructed for maternal race/ethnicity: Black, Hispanic, and Other (white = reference category).

I include three variables collected at Wave 2 that tap the cognitive and socioemotional functioning when the preschool child was approximately 24 months old: vocabulary, communication skills and socioemotional development and behavior. A direct assessment of children's vocabulary at year-two was obtained by parent report due to time constraints and feasibility in the ECLS-B. The primary parent report measure of children's vocabulary is the McArthur Communicative Development Inventory (M-CDI), which is an infant and toddler form for children 16 to 30 months of age. Scores are obtained by simply summing the words the child can say. Vocabulary variables are coded 1 = *yes* and 0 = *no*, with higher scores indicating higher vocabulary, on a 0- 50 point scale. Parents also rated their children's communication skills reporting on whether the child has begun to combine words, a description of how the child communicates, if the child adds an "s" to talk about more than one thing, does the child talk about ownership, does the child add "ing" to verb when talking about an activity, and whether the child adds "ed" to talk about the past. Communication skill variables are coded differently depending on the variable. Two variables, child has begun to combine words is coded 0= *not yet*, 1= *sometimes*, 2=*often*, while description of how child communicates is coded 0 = *mostly uses one-word sentences*, 1= *talks in 2-3 word phrases*, 2= *talks fairly in complete short sentences*, 3= *talks in long and complicated sentences*. The remaining 4 variables are all coded 0= *no* and 1= *yes*. Communication skills with higher scores indicate higher communication skills, on a 1-9 point scale.

To measure socioemotional and learning related behavior during Wave 2, interviewers used the BRS-R to rate a child's self-regulation (Bayley, 1993). At the 24 month ECLS-B assessment, NCES included 11 interviewer-rated items from the full BRS in the BRS-R. These items measured developmentally appropriate behaviors for 24-month-old children (Nord et al., 2004; Saunders, Dulaney, Reaney, Flanagan, & West, 2006). The 11 items included whether the child displays positive affect, how well they adapt to changes in material, whether child shows interest in material, pays attention to task, is persistent in task, displays social engagement, displays cooperation, shows control of movement, displays negative affect, displays fearfulness, and child displays frustration when in tasks. These 11 items were coded and summed such that higher scores represent better socioemotional functioning and behavior.

Additional control variables. I also include two additional variables which capture two aspects of maternal employment that may be correlated with nonstandard work schedules as well

as the child outcomes: hours worked and job benefits. Women who work part-time are more likely to also work in jobs with nonstandard hours (McMenamin, 2007). Here I include a measure of the number of hours worked by using a variable which asked mothers how many hours a week they usually work (responses ranged from 1-20, 21-35, 36-40 and more than 40 hours). A dummy variable was created to represent whether mothers worked fulltime (36-40 hours per week). To tap into the kinds of work or quality of employment, several dummy variables were included which indicate whether the mother's employer offered medical or hospital insurance, sick leave with full pay, childcare assistance, flexible hours, or a dental plan.

Mediating Mechanisms

Prior studies have suggested at least two pathways by which nonstandard work schedules may impact child development: via heightened parental stress and maternal depression (Joshi & Brogen 2007; Strazdins et al., 2006). Therefore, I examine both maternal depression and parenting stress as potential mediators to explain the relationship between nonstandard work and child cognitive, behavioral and socioemotional development.

Maternal depression. Maternal depression is measured using the modified version of the Center for Epidemiologic Studies-Depression Scale (CES-D). The original CES-D is a 20-item depression screening questionnaire designed to measure point prevalence of depression in epidemiological studies on a 0-60 point scale. The 12-item version of the CES-D consists of the core depressive symptom identification questions from the original CES-D. It uses a 1 to 4 point range for each question, asking how often these symptoms have been reported in the past week. Such items include mother's self-report of feeling bothered, having a poor appetite, feeling blue, having trouble keeping focused, feeling depressed, finding everything is an effort, feeling fearful, having trouble sleeping, talking less than usual, feeling lonely, feeling sad, and having trouble getting going. Guidelines and cut points provided in the ECLS-B User's Manual, were used to score the items to create a CES-D score. Since the depression score is highly skewed with most mothers reporting mild or no depressive symptoms, a binary dummy variable comparing mothers with moderate to severe depressive symptoms to mothers with mild or no depressive symptoms were used in the multivariate analysis. Mothers with a score ranging from 0-9 were coded as not depressed/ mildly depressed while moderately depressed /severely depressed scores ranged from 10 to 15 or higher.

Parenting stress. To measure how often mothers felt stress related directly to parenting

responsibilities and tasks, items from the Self-Administered Questionnaire (SAQ) were used. These 5 items asked mothers to what extent they felt being a parent is hard, trapped by responsibilities, being a parent is more work than pleasure, often felt tired, and the extent to which they felt they gave up for child needs. Responses were coded such that higher scores reflected increased levels of stress related to parenting (i.e., 1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, and 4 = strongly agree). These 5 items were summed to create the *Parenting Stress scale*.

Statistical Analysis

This study examines whether maternal nonstandard work schedules are related to children's cognitive, social and behavioral development during the preschool years and if so, whether parental stress and maternal depression mediate the relationship. To answer the research questions, multiple hierarchical regression analyses were performed using STATA 12. In hierarchical regression analysis, variables are entered into the model in a specific order in accordance with theoretical criteria to test hypotheses. I conducted four separate regression analyses for each of the dependent variables: math ability, early literacy, internalizing behavior problems and externalizing behavior problems. In each of the analyses, the order in which the variables were entered into the regression model is the same for each dependent variable and allows me to test for possible mediation. Model 1 includes only the measure for nonstandard work to provide a baseline of the association between mother's nonstandard work schedules and child well-being. To determine if the nonstandard work effect is due to mothers also working fewer hours and/or in lower quality jobs, Model 2 adds controls for whether the mother worked full-time and the extent to which her job provided different kinds of benefits (i.e., child care assistance, flex-time, medical insurance), which serve as proxies for job quality. Model 3 adds controls for various family, maternal and child characteristics including children's cognitive and behavioral development measured at 24 months. The addition of these variables allows me to determine whether the impact on nonstandard work is due to a compositional effect in that certain mothers may select themselves into working nonstandard hours and these factors may also be related to child outcomes. To determine whether the relationship between maternal work conditions and child development is partly due to the differences in parenting stress and maternal depression, Models 4 and 5 include measures for parenting stress and maternal depression, respectively. These maternal variables are entered separately to determine whether these factors

alone mediate the relationship between nonstandard work and child well-being. The final model, Model 6, includes both parenting stress and maternal depression to examine the collective impact of both factors on child development and in mediating the relationship between nonstandard work and child outcomes.

Chapter Five: Results

Descriptives

Prior studies have suggested that single mothers are more likely to work nonstandard hours and schedules compared to married mothers or the general population (Presser, 2003). According to recent national estimates, about 16 percent of all women worked nonstandard schedules (McMenamin, 2007). In this sample, approximately one third of single mothers with preschool age children worked nonstandard hours. In terms of other job characteristics, half of the women were employed full-time which coincides with similar percentages for certain work benefits associated with full-time employment such as, medical insurance, sick leave, dental and flex time. Approximately, one in four single mothers reported symptoms indicative of moderate to severe depression. They also reported moderate levels of parenting stress. As expected, almost half of the single mothers in the sample were living below the poverty line.

Nonstandard Work and Preschool Cognitive Development

The regression analysis presented in Tables 2 and 3 examine the impact of maternal nonstandard work schedules on preschool children's early math and literacy ability (Model 1). As previously discussed, to test whether the effects of maternal work schedules and job conditions were unique or accounted for by other factors, a series of OLS regression equations were estimated in which additional predictors were added to each model. Hours and job benefits were added as controls in Model 2 and family, maternal, and child characteristics were added as controls in Model 3. Models 4 and 5 add parenting stress and maternal depression individually to the model to determine whether they mediate the relationship between nonstandard work on children's cognitive development, with the final model (Model 6), including both parenting stress and maternal depression to estimate the collective impact.

The results from the first model predicting math ability (Table 2) suggests that among single mothers there is a significant negative association between working nonstandard work hours and preschool math ability. This negative relationship persists even after controls for job characteristics in Model 2. In Model 3, family size, family poverty, maternal race/ethnicity, age, education, child characteristics, and child development at age 2 are added to the model. These variables collectively account for approximately 25 percent of the relationship between nonstandard work and children's math achievement. This suggests that at least part of the reason why children have lower math ability in families where single mothers work nonstandard hours

is a compositional effect. Single mothers who work nonstandard hours are also more likely to have less education and live in poverty, for example, both of which are associated with lower cognitive development. Surprisingly, the results in Models 4-6 suggest that while higher levels of stress and depression are associated with lower math achievement, these coefficients fail to reach significance and do not mediate any of the relationship between maternal nonstandard work and children's mathematics achievement. The results in the final model (Model 6) show the robustness of the association between nonstandard work hours and early math achievement. Children whose mothers work nonstandard hours have lower math ability at preschool and this effect remains despite controlling for job, family and child characteristics and maternal stress and depression.

The results presented in Table 3 examine early literacy development in preschool children of single working mothers and mirror the findings regarding math achievement. The results suggest that preschool children in single mother families whose mother works nonstandard hours have lower literacy development, and this relationship remains after controlling for job, family and child characteristics. Like math, controlling for maternal, child and family characteristics in Model 3 reduces the effect of nonstandard work hours by approximately one-third. Models 4 and 5 add parenting stress and maternal depression to the model. While parenting stress does not mediate any of the relationship between nonstandard work and early literacy development, maternal depression does seem to play a role. In Model 5, the results indicate that children of depressed single mothers have significantly poorer early literacy skills compared to children of non-depressed or mildly depressed mothers. Further, once maternal depression is added to the model the nonstandard work coefficient is reduced and becomes marginally significant. This suggests that maternal depression might account for at least some of the negative association between nonstandard work hours and early literacy.

Similar to prior work on the effects of nonstandard work, in samples of all mothers regardless of marital status, these results show that children of single mothers, in part, who work nonstandard schedules have worse cognitive outcomes compared to children whose single mothers work standard hours (Brooks-Gunn et al., 2010; Han & Waldfogel, 2007; Han, Miller, & Waldfogel, 2010; Joshi & Bogen, 2007). This effect persisted even after a host of job, maternal, child and family characteristics were controlled. However, I find little support for the

notion that parenting stress and maternal depression are the main mechanisms linking nonstandard work with poorer cognitive outcomes in children.

Nonstandard Work and Preschool Behavior and Socioemotional Development

Tables 4 and 5 present the results from a regression analysis that examines the impact of maternal nonstandard work schedules on preschool children's behavior problems and socioemotional development. Like the analysis for cognitive outcomes, I also examine whether parenting stress and maternal depression play a role in mediating the relationship between nonstandard work and children's behavior. Table 4 presents the results for internalizing behavior problems among preschool children of single mother families. The internalizing behavior score is coded such that higher values correspond to worse internalizing behavior (i.e., child does not make friends easily; does not volunteer or share). Model 1 suggests that single mother's who work a nonstandard job have children with more internalizing behavior problems. This association remains significant, even when hours worked (Model 2) and job benefits are added to the model (Model 3). When controlling for family, maternal, and child characteristics including child development at age 2, nonstandard work remains statistically significant. The results in Model 4 suggest that children whose mothers have higher levels of parenting-related stress have significantly poorer socioemotional functioning and behavior. However, parenting stress does not seem to explain any of the positive association between nonstandard work and greater internalizing behavior problems among preschool children in single mother families. Unlike the results for early literacy, children whose mothers are depressed do not seem to have greater internalizing behavior problems. The final model (Model 6) indicates that working a nonstandard job and having higher levels of parenting stress are associated with significantly more internalizing behavior problems among preschool children in single mother families.

Unlike the results for mathematics, early literacy and internalizing behavior problems, the results in Table 5 suggest that nonstandard work is not related to preschool children's externalizing behavior problems. However, parenting stress and maternal depression are significantly associated with externalizing behavior problems when entered into the model separately (Models 4 and 5). Higher levels of parenting stress are also associated with greater externalizing behavior problems among preschool children (Model 4). Preschool children whose mothers have moderate to severe depressive symptoms are more likely to have higher levels of externalizing behavior (Model 5). However, when parenting stress and maternal depression are

added to the model together, maternal depression is reduced by half and loses significance. This suggests single mothers who are depressed are experiencing higher levels of parental stress which in turn negatively affects their children's behavior.

Table 2
Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Math Ability

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Job Conditions						
Nonstandard Work	-2.27*** (.62)	-2.11*** (.63)	-1.59** (.55)	-1.59** (.55)	-1.57** (.55)	-1.58** (.55)
Fulltime		-.58 (.59)	.11 (.51)	.12 (.51)	.14 (.51)	.14 (.51)
Job Benefits						
Child care		-1.65 (1.02)	-2.04* (.90)	-1.99* (.90)	-2.06* (.90)	-2.02* (.90)
Dental		1.23 (.98)	.74 (.88)	.74 (.88)	.80 (.88)	.79 (.88)
Flex time		-.34 (.57)	-.37 (.51)	-.36 (.50)	-.36 (.50)	-.36 (.50)
Medical		-.42 (.10)	-.88 (.90)	-.88 (.90)	-.88 (.90)	-.88 (.90)
Sick Leave		1.93** (.71)	-.24* (.23)	1.21* (.63)	1.19* (.63)	1.18 [†] (.63)
Parenting Stress				-.09 (.07)		-.07 (.07)
Maternal Depression					-.66 (.59)	-.51 (.62)
Family Characteristics						
Family Size			-.24 (.23)	-.22 (.23)	-.25 (.23)	-.23 (.23)
Family Poverty			-1.90** (.61)	-1.86** (.61)	-1.82** (.61)	-1.81** (.61)

Table 2 (continued)

Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Math Ability

Maternal Characteristics						
Black			-1.18* (.61)	-1.13 [†] (.61)	-1.17* (.61)	-1.13 [†] (.61)
Hispanic			-1.99** (.72)	-2.00** (.72)	-2.02** (.72)	-2.02** (.72)
Other			-.73 (.86)	-.72 (.86)	-.71 (.86)	-.71 (.86)
Age			-.01 (.04)	-.01 (.04)	-.01 (.04)	.01 (.04)
Education			.93** (.31)	.91** (.31)	.90** (.31)	.90** (.31)
Child Characteristics						
Age			.58*** (.06)	.58*** (.06)	.58*** (.06)	.58*** (.06)
Male			-.97* (.50)	-.98* (.50)	-1.0* (.50)	-1.0* (.50)
Child Development Age 2						
Vocab			.10** (.04)	.10** (.04)	.09** (.04)	.09** (.04)
Communication			.06 (.21)	.07 (.21)	.07 (.21)	.07 (.21)
Behavior			.40*** (.06)	.40*** (.06)	.39*** (.06)	.39*** (.06)
Constant	20.40 (.34)	19.58 (.61)	-22.50 (3.70)	-21.46 (3.80)	-22.11 (3.71)	-21.38 (3.80)
R ²	.01	.03	.30	.30	.30	.30

[†]p < .10. *p < .05. **p < .01. ***p < .001.

Table 3

Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Early Literacy

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Job Conditions						
Nonstandard Work	-1.50** (.54)	-1.39** (.54)	-.96* (.50)	.96* (.50)	.94† (.50)	-.94† (.50)
Fulltime		-.64 (.50)	-.16 (.45)	-.15 (.45)	-.12 (.45)	.12 (.45)
Job Benefits						
Child care		-1.06 (.88)	-1.41† (.80)	-1.39† (.80)	-1.44† (.80)	-1.44† (.80)
Dental		.94 .83	.47 (.76)	.48 (.76)	.56 (.76)	.56 (.76)
Flex time		-.02 (.48)	-.02 (.44)	-.02 (.44)	-.01 (.44)	-.01 (.44)
Medical		-.00 (.87)	-.41 (.77)	-.41 (.77)	-.41 (.77)	-.41 (.77)
Sick Leave		1.18* (.61)	.64 (.56)	.64 (.56)	.59 (.56)	.59 (.56)
Parenting Stress				-.03 (.06)		.01 (.07)
Maternal Depression					-.94† (.52)	-.96† (.54)
Family Characteristics						
Family Size			-.28 (.21)	-.27 (.21)	-.29 (.21)	-.29 (.21)
Family Poverty			-1.42** (.53)	-1.41** (.53)	-1.31** (.53)	-1.31** (.53)

Table 3 (continued)

Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Early Literacy

Maternal Characteristics						
Black			-.55 (.54)	-.53 (.55)	-.53 (.54)	-.54 (.55)
Hispanic			-1.96** (.64)	-1.96** (.64)	-2.00** (.64)	-2.00** (.64)
Other			.17 (.77)	.18 (.76)	.20 (.76)	.20 (.76)
Age			-.00 (.04)	-.00 (.04)	-.000 (.04)	-.000 (.04)
Education			1.11*** .26	1.10*** (.26)	1.08*** (.26)	1.08*** (.26)
Child Characteristics						
Age			.50*** (.05)	.50*** (.05)	.50*** (.05)	.50*** (.05)
Male			-1.29** (.44)	-1.29** (.44)	-1.34** (.44)	-1.34** (.44)
Child Development Age 2						
Vocab			.05 (.03)	.05 (.03)	.05 (.03)	.05 (.03)
Communication			.11 (.18)	.12 (.18)	.13 (.18)	.13 (.18)
Behavior			.22*** (.05)	.22*** (.05)	.21*** (.05)	.21*** (.05)
Constant	11.53 (.28)	10.83 (.52)	-22.62 (3.3)	-22.30 (3.3)	-22.07 (3.3)	-22.16 (3.4)
R ²	.01	.02	.24	.24	.24	.24

†p < .10. *p < .05. **p < .01. ***p < .001.

Table 4
Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Internalizing Behavior Problems

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Job Conditions						
Nonstandard Work	1.11** (.44)	1.10** (.44)	1.00** (.42)	1.02** (.41)	1.00** (.42)	1.03** (.41)
Fulltime		.33 (.42)	-.01 (.40)	-.04 (.40)	-.01 (.40)	-.21 (.40)
Job Benefits						
Child care		2.40*** (.73)	2.25*** (.70)	2.11** (.69)	2.25*** (.70)	2.09** (.69)
Dental		-1.15† (.69)	-1.10† (.66)	-1.13† (.65)	-1.11† (.66)	-1.08† (.65)
Flex time		-.16 (.40)	-.12 (.38)	-.14 (.37)	-.12 (.38)	-.13 (.37)
Medical		.09 (.72)	.47 (.68)	.46 (.67)	.47 (.68)	.46 (.67)
Sick Leave		-.13 (.50)	-.01 (.49)	.03 (.48)	-.01 (.49)	.00 (.48)
Parenting Stress				.25*** (.06)		.26*** (.06)
Maternal Depression					.09 (.46)	-.51 (.47)
Family Characteristics						
Family Size			.35* (.18)	.30† (.18)	.35* (.18)	.29 (.18)
Family Poverty			.30 (.46)	.19 (.45)	.29 (.46)	.24 (.46)

Table 4 (continued)

Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Internalizing Behavior Problems

Maternal Characteristics						
Black			1.07* (.47)	.92* (.46)	1.06* (.47)	.91* (.46)
Hispanic			.24 (.56)	.27 (.55)	.25 (.56)	.25 (.55)
Other			-.33 (.66)	-.36 (.65)	-.34 (.66)	-.35 (.65)
Age			.09** (.03)	.09** (.03)	-.09** (.03)	.09** (.03)
Education			-.36 (.23)	.31 (.23)	-.35 (.23)	-.32 (.23)
Child Characteristics						
Age			-.11** (.04)	-.11** (.04)	-.11** (.04)	-.11** (.04)
Male			.59 (.383)	.60 (.378)	.59 (.384)	.57 (.379)
Child Development Age 2						
Vocab			-.11*** (.02)	-.11*** (.02)	-.11*** (.02)	-.12*** (.02)
Communication			-.08 (.14)	-.10 (.13)	-.08 (.14)	-.09 (.13)
Behavior			-.07 [†] (.04)	-.06 (.04)	-.07 [†] (.04)	-.07 (.04)
Constant	17.08 (.23)	17.39 (.42)	25.27 (2.81)	22.30 (2.85)	25.21 (2.82)	22.37 (2.85)
R ²	.01	.03	.15	.17	.15	.17

[†]p < .10. *p < .05. **p < .01. ***p < .001.

Table 5
Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Externalizing Behavior Problems

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Job Conditions						
Nonstandard Work	-.18 (.34)	-.13 (.35)	-.20 (.34)	-.18 (.33)	-.22 (.34)	-.20 (.33)
Fulltime		.10 (.33)	-.08 (.32)	-.10 (.31)	-.12 (.32)	-.12 (.31)
Job Benefits						
Child care		.98 [†] (.57)	.99 [†] (.56)	.85 (.55)	1.02 [†] (.55)	.88 (.55)
Dental		.07 (.54)	.21 (.54)	.19 (.53)	.10 (.53)	.14 (.53)
Flex time		.22 (.32)	.25 (.31)	.24 (.30)	.23 (.31)	.23 (.30)
Medical		-.50 (.56)	-.27 (.55)	-.27 (.54)	-.27 (.55)	-.27 (.54)
Sick Leave		.31 (.40)	.58 (.40)	.61 (.39)	.64 (.39)	.64 (.39)
Parenting Stress				.25*** (.04)		.23*** (.05)
Maternal Depression					1.07** (.35)	.55 (.37)
Family Characteristics						
Family Size			.25 [†] (.15)	.20 (.14)	.26 [†] (.15)	.21 (.14)
Family Poverty			.75* (.37)	.64 [†] (.36)	.63 [†] (.37)	.59 (.36)

Table 5 (continued)

Maternal Nonstandard Work, Other Job Conditions and Preschool Children's Externalizing Behavior Problems

Maternal Characteristics						
Black			-.77* (.38)	-.92** (.37)	-.78* (.37)	-.92** (.37)
Hispanic			-.99* (.45)	-.96* (.45)	-.93* (.45)	-.94* (.45)
Other			-.48 (.54)	-.51 (.53)	-.51 (.53)	-.52 (.53)
Age			7.00 (.03)	.01 (.03)	-.00 (.03)	.01 (.03)
Education			-.49** (.18)	-.44** (.18)	-.45** (.18)	-.43** (.18)
Child Characteristics						
Age			-.02 (.04)	-.02 (.03)	-.01 (.04)	-.01 (.03)
Male			1.74*** (.31)	1.75*** (.30)	1.80*** (.31)	1.78*** (.30)
Child Development Age 2						
Vocab			-.01 (.02)	-.01 (.02)	-.01 (.02)	-.01 (.02)
Communication			-.13 (.12)	-.14 (.11)	-.15 (.11)	-.15 (.11)
Behavior			-.03 (.03)	-.03 (.03)	-.03 (.03)	-.02 (.03)
Constant	9.99 (.19)	9.84 (.34)	12.24 (2.28)	9.24 (2.31)	11.61 (2.28)	9.17 (2.31)
R ²	.00	.00	.08	.12	.09	.12

†p < .10. *p < .05. **p < .01. ***p < .001.

Chapter Six: Discussion, Limitations, and Conclusion

The purpose of this study was to examine whether maternal nonstandard work schedules are related to children's cognitive, social, and behavioral development during the preschool years, and if so, whether parental stress and maternal depression mediate the relationship. According to work-family conflict theory, a type of inter role conflict occurs when the demands of work and family roles clash (Byron, 2005). When individuals feel work-family conflict, they are more likely to experience increased stress and negative well-being (Gassman-Pines, 2011). This may be more evident in single mother families as they have just as many child demands as two parent families but only have half as many adults to meet such demands (Waldfoegel & McLanahan, 2011), perhaps causing increased tension between paid work and family caregiving (Hseueh & Yoshikawa, 2007; Joshi & Bogan, 2007). Not only are single mothers working to provide for their family, they are also more likely to work nonstandard times and work longer hours, with lower earnings and fewer benefits (i.e. health insurance, paid vacation, or holidays) than married mothers (Douglas-Hall et al., 2007; Strazdins et al., 2004). Results from this study extend our understanding of the impact of working in jobs with nonstandard schedules within the context of single mother families. Children whose mothers work nonstandard schedules are significantly more likely to have lower cognitive development and worse internalizing behavior problems compared to children whose mothers work the regular dayshift. While these associations are reduced somewhat when family, maternal and child characteristics are added to the model, nonstandard work remains significantly related to math ability, early literacy and internalizing behavior problems. These results mirror those found by Han (2004) and others and demonstrate that the negative impact of working nonstandard hours on child development is evident in single mother families as well. For externalizing behavior, however, I find no differences among children of single mothers who work nonstandard versus standard hours.

Prior research has found parenting stress and depression to be related to poorer cognitive and socioemotional outcomes in children (Han, 2006). In this sample of single mothers, maternal depression is related to lower early literacy and increased externalizing behavior problems among preschool children. However, studies have also suggested that nonstandard work may affect child outcomes via increased stress, anxiety and depression (Joshi & Bogen 2007; Strazdins et al., 2006). While my results suggest that children whose mothers have higher levels of parenting-related stress have significantly poorer socioemotional functioning and greater

externalizing behavior problems, stress does not seem to mediate the relationship between nonstandard work and behavioral outcomes. Indeed, the only evidence for mediation I find is for early literacy where maternal depression seems to explain some of the negative effect of working nonstandard hours. This suggests that the mechanisms by which nonstandard work affect children's cognitive and behavioral development might be different for preschool children in single mother families.

Limitations

This study addresses a gap in prior work, modeling how nonstandard work hours could be associated with poorer cognitive and behavioral development among preschool children in single mother families but also assessing the extent to which parenting stress and maternal depression may mediate this relationship. The findings of this study must be interpreted within the context of its limitations. First, studies have reported that African Americans generally have a higher prevalence of depressive symptoms, compared to their White counterparts (Nguyen, Kitner-Triolo, Evans, & Zonderman, 2004). However, the depression score in my sample was highly skewed with most mothers reporting mild or no depressive symptoms, although over half of my sample was African American. It could be possible that they were underreporting depressive symptoms, leading to such results. Disagreement about the conceptualization of depressive symptoms among minority populations should be taken into account, in order to eliminate such discrepancy. Next, the parenting stress measure used could be too specific. A broader measure is needed that taps into the difficulties that single mothers have in finding reliable and affordable childcare, as well as other sources of parenting stress such as parent-child interactions and specific measures of role strain. Third, this study did not examine how long single mothers worked in jobs with a nonstandard shift. Prior research has shown that timing and duration of maternal nonstandard work matter for young children's outcomes (Han, 2005). Finally, marital status was only taken at one point in time, perhaps masking important differences between mothers who have been single since the beginning of their child's life or recently became single. Transitioning from married to single motherhood has been found to be associated with changes in perceived social support, material hardship, maternal depression, and parenting stress, (Osborne, Berger, & Magnuson, 2012). Thus, mothers who recently became single mothers may look completely different from mothers who have been single since the birth of their child or for longer periods of time. Nevertheless, the results from this analysis add to the

growing body of literature explaining the negative impact that working nonstandard hours has on preschool children's cognitive, social, and behavioral development in single mother families.

Conclusion

In summary, the results of this study shed light on the possible mediating factors that contribute to children's cognitive, social, and behavioral development of single working mothers of preschool age children. The findings from the multivariate analyses support several important conclusions. First, nonstandard work is negatively associated with early literacy and math ability and internalizing problems among preschool age children of single working mothers, even after controlling for job, child, and maternal characteristics. Two, maternal depression slightly mediated the relationship between maternal employment and early literacy, suggesting that maternal mental health may be one factor to consider when trying to understand how nonstandard work matters for single mothers. Finally, single mothers who are depressed are experiencing higher levels of parental stress, which can in turn, contribute to greater externalizing behavior problems. Although aggressive, noncompliant, and oppositional acts are commonly observed in young children, maternal depression seems to exacerbate such behavior. Future research must examine other ways nonstandard work may affect child development. For example, in another study of single mothers of preschool children, Lleras (2008a) found nonstandard work hours to be related to the home environment which included measures of parenting behaviors and the quality of mother-child interaction. It is also possible that nonstandard work hours may also be related to lower quality childcare or inconsistent childcare which in turn may increase stress and negatively affect the quality of parenting and lead to poorer child outcomes. Single mother households continue to be on the rise as do the kinds of jobs that require nonstandard work hours. Given these two trends and the results of this study, further research is needed to study how nonstandard work may affect the children of single mothers specifically who work in this 24/7 economy.

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