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Chapter I. Introduction: Understanding the Transition to Siblinghood from a Developmental Psychopathology and Ecological Systems Perspective

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Abstract

The birth of an infant sibling is a common occurrence in the lives of many toddler and preschool children. Early childhood is also a time for the emergence of disruptive behavior problems that may set the stage for later problem behaviors. The current study examined individual differences in young children's behavioral and emotional adjustment after the birth of a sibling in an effort to uncover developmental trajectories reflecting sudden and persistent change (maladaptation), adjustment and adaptation (resilience), gradual linear increases, and no change (stability and continuity). Growth mixture modeling (GMM) was conducted with a sample of 241 families expecting their second child using a longitudinal research design across the first year after the sibling's birth (prenatal, 1, 4 8 and 12 months) on seven syndrome scales of the Child Behavior Checklist (CBCL 1.5–5:(Achenbach & Rescorla, 2000): aggression, attention problems, anxiety/depression, emotional reactivity, withdrawal, somatic complaints, and sleep problems. For all scales, multiple classes describing different trajectory patterns emerged that reflected predominantly intercept differences; children high on problem behavior after the birth were those high before the birth. There was no evidence of a sudden, persistent maladaptive response indicating children underwent a developmental crisis for any of the problem behaviors examined. Most children were low on all problem behaviors examined and showed little change or actually declined in problem behaviors over time, although some children did experience more pronounced changes in the borderline clinical or clinical range. Only in the case of aggressive behavior was there evidence of an Adjustment and Adaptation Response showing a sudden change (prenatal to 1 month) that subsided by 4 months, suggesting that some young children react to stressful life events but adapt quickly to these changing circumstances. Further, children's withdrawal revealed a curvilinear, quadratic path, suggesting children both increased and decreased in their withdrawal over time. Guided by a developmental ecological systems framework, we employed data mining procedures to uncover the child, parent, and family variables that best discriminated the different trajectory classes and found that children's temperament, coparenting, parental self-efficacy, and parent-child attachment relationships were prominent in predicting children's adjustment after the birth of an infant sibling. Finally, when trajectory classes were used to predict sibling relationship quality at 12 months, children high on aggression, attention problems, and emotional reactivity in the year after the birth engaged in more conflict and less positive involvement with the infant sibling at the end of the first year.

For most children, the birth of an infant sibling is a significant developmental transition (Dunn, 1988; Volling, 2005). Similar to other normative life transitions, the period surrounding the birth of a second child can be stressful for some young children (Dunn,

1988). In response to stress, young children often experience sleep disruptions, increases in temper tantrums, whininess, clinging, and anxiety (Campbell, 2002), but the birth of an infant sibling can also bring about positive changes, as well as opportunities for children to grow emotionally through their daily interactions with the infant (Dunn & Kendrick, 1982). The birth of a second child also marks the very beginning of a child's first sibling relationship, one of the longest lasting social relationships of a person's life. Most firstborn children are usually toddlers between 2 and 3 years of age when a second child is born (Baydar, Hyle, & Brooks-Gunn, 1997), a developmental time period when most young children demonstrate noncompliant, aggressive, and demanding behaviors, in general, and dealing with the "terrible twos" is considered normative for parents.

One of the challenges for research on the development of disruptive behavior for very young children, and for the transition following the birth of a sibling, is discerning which behaviors constitute a cause for concern and what distinguishes those children having difficulties with the transition from normative developmental changes in challenging behaviors typical of the toddler and preschool period. Indeed, there appear to be large individual differences in how firstborn children react to the birth of an infant sibling with indications that some children experience stress and a period of disruption, whereas others do not (Volling, 2012). There were three goals to the present report. The first goal was to determine whether firstborn children responded differently to the birth of an infant sibling and to identify those children having a difficult time adjusting to the stresses associated with the infant's arrival. To this end, we took a person-centered approach to examine developmental trajectories of firstborns' behavioral and emotional adjustment across the transition to siblinghood, the period when the firstborn moves from only child to older sibling, in an effort to examine individual differences in children's adjustment across this time. In doing so, we conceptualized several possible longitudinal trajectories that could define different types of psychological adjustment experiences for the young child (e.g., short-term adjustment and adaptation, sudden and persistent maladaptation, delayed impact, growth and maturity, stability and continuity) in the year following the birth of a sibling, and tested for these specific trajectory patterns using a person-centered approach (growth mixture modeling). Due to individual differences noted in children's responses to the birth of a sibling, we hypothesized that we would uncover groups (i.e., latent classes) of children following multiple pathways of adjustment over the course of the year. Once these classes were revealed, a second goal of this report was to use indicators of child, parent, and family characteristics collected at the prenatal timepoint to predict children's developmental trajectories. In so doing, we could identify the risks and protective factors that discriminated adjustment trajectories and would allow us to detect with some precision the areas to be targeted for the development of prevention programs designed to assist families making the transition. To accomplish this second goal, we relied on the developmental ecological systems framework (Volling, 2005) to create a potential pool of predictors, including child (e.g., age, gender, temperament), parent (e.g., depression, efficacy) and family (e.g., coparenting, attachment) variables that were used in a series of cross-validated data mining techniques followed by traditional statistical testing procedures. Finally, the third goal was to examine how the different trajectories of children's emotional and behavioral adjustment

predicted sibling relationship outcomes (i.e., conflict, positive involvement) 1 year after the infant sibling's birth.

The current report begins with a theoretical discussion of young children's behavioral and emotional difficulties from a developmental psychopathology perspective, arguing that young children's behavior problems after the birth of a sibling must be viewed in relation to behaviors that may be annoying and troublesome in the toddler and preschool years, but are considered normative. We also present our ideas for defining different developmental trajectories of adaptation and maladaptation based on theories of family risk and resilience that will be tested directly in our group-based trajectory analyses. This chapter will also discuss a developmental ecological systems perspective that situates the child within a larger set of family and contextual influences that serve as risk and protective factors and determine which children may develop problems over the course of the transition (Volling, 2005) so that we have the theoretical basis for choosing variables used in our prediction analyses. We will also address how variability in children's adjustment after the birth of a sibling may have developmental consequences for sibling interactions later in the year to establish the basis for examining the relations between behavioral and emotional adjustment trajectories and children's sibling relationships. We then turn to a presentation of the methods and procedures for the current study, the Family Transitions Study, a longitudinal, prospective study designed specifically to address changes in firstborn children's adjustment after the birth of their infant sibling. We will also describe our data analytic strategy in some detail and our thinking about the determination and meaning of classes when examining the development of psychopathology in young children before presenting the results. As for results, we begin with an overview of the developmental models describing mean level change in the sample before moving to an examination of individual differences in the seven syndrome scales examined with a chapter devoted to each. We end by discussing the implications of our findings for families undergoing the transition from one child to two, as well as recommendations for professionals wanting to assist parents with the stresses associated with the birth of a second child.

Adjustment and Maladjustment in Toddler and Preschool Children: A Developmental Psychopathology Perspective

In the current study, we take a developmental psychopathology perspective in understanding children's adjustment after the birth of a sibling and use a developmental ecological systems framework to address the risk and protective factors that predict children's adjustment outcomes. According to a developmental psychopathology approach to understanding adjustment difficulties, young children's adjustment needs to be understood in relation to normative developmental changes occurring during the toddler and preschool years. As Campbell (2011) notes, many problems of children in this age bracket are age-related and transient, often reflecting difficulties adjusting to a stressful developmental transition such as the birth of a sibling. Some children, however, may exhibit more chronic or severe reactions that impair cognitive and social development, that then negatively impact family relationships and require focused interventions to help alleviate these problems. Even when behavioral or emotional challenges are short-lived or a normative reaction to environmental

and family stress, they can still pose considerable concern for parents who have to respond to difficult behavior at a time when they, too, may be overwhelmed with family stress and the care of a newborn.

Knowing that most children experience the birth of a sibling between the ages of 2 and 3 (Baydar et al., 1997), it is imperative to examine normative developmental advances during the period of early childhood in order to comprehend what constitutes maladjustment or to understand what sorts of emotional and behavioral disruptions might be observed. Early childhood is a period of significant developmental advances in social, communicative, cognitive, emotional and even motor development (Brownell & Kopp, 2007). From 18 to 36 months of age children develop a growing sense of self, evince a theory of mind and understanding of others, express empathic concern, socially engage in pretend play, and learn to regulate emotions and behavior (Brownell & Kopp, 2007). Between 3 and 5 years of age, there are further advances in language used to communicate feelings and experiences, and engagement in more sophisticated forms of joint pretend play with parents, siblings and friends. Advances in moral development also emerge with a growing capacity to empathize with others, experience guilt in response to wrong-doing and appreciate rule-governed behavior (Kochanska, 1993). Although many of these advances coincide with brain maturation, support and guidance from adult caregivers shape children's developing trajectories of adjustment. In addition, parents and child-care providers make increasing demands for more mature behavior and dispense more firm control and discipline in response to children's transgressions as they get older. Stressful life events during this period may trigger emotional and behavioral reactions such as temper tantrums, noncompliance and defiance, clinginess and separation anxiety, sleep problems, and regression to earlier forms of behavior (e.g., toileting accidents, use of a pacifier). Many of these childhood difficulties have been documented after the birth of a sibling (Dunn & Kendrick, 1982; Legg, Sherick, & Wadland, 1974; Stewart, 1990; Trause, 1978), but what is less clear is whether these difficulties are already evident before the birth, are transient and normative reactions to stress, or may lay the foundation for more serious problems in the future (Campbell, 2002). When these life events occur, behavioral and emotional difficulties may be exacerbated in families experiencing high levels of stress, with emotionally vulnerable parents who feel unable to control children's behaviors, when there are few emotional supports available to parents, when parents are insensitive to or lack an understanding of their children's emotional turmoil, and when they respond harshly or punitively to their children's misbehaviors (Cummings, Davies, & Campbell, 2000).

Because pathological outcomes must be understood in relation to normative development, a developmental psychopathology perspective is concerned with multiple developmental outcomes that describe normative, at-risk, and pathological groups of children (Cummings et al., 2000). In other words, there is a focus on understanding individual differences in developmental trajectories that reflect normative developmental changes, as well as high-risk trajectories that may set the stage for the emergence of psychopathology at a later point in time. As such, there is an interest in examining both adaptation (i.e. resilience) and maladaptation (e.g., psychopathology) in response to stressful life circumstances, in contrast to traditional psychiatric or pathological approaches that focus predominantly on negative life experiences (e.g., trauma) and negative outcomes (e.g., clinical diagnoses). The earliest

research on the transition to siblinghood was deeply rooted in these traditional perspectives underscoring the psychodynamic turmoil and hostile-reactive behavioral patterns of young children to the birth of their infant sibling (e.g., Levy, 1934, 1937; Petty, 1953). These psychodynamic perspectives continue to influence our current thinking about the transition to siblinghood and often lead parents to fear the worst from their firstborn children (Gullicks & Crase, 1993). It is time to apply a developmental psychopathology perspective to understanding young children's reactions to the birth of an infant sibling so parents can understand what to reasonably expect after the birth of a second child, how they can respond to their family circumstances, and how professionals can offer assistance to families undergoing a more difficult transition. The Family Transitions Study (FTS) was designed with these issues in mind.

Conceptualizing Change Trajectories of Adaptation and Maladaptation

The current report relies on theories of family risk and resilience as a starting point for conceptualizing adaptive and maladaptive trajectory patterns after a stressful life event such as the birth of an infant sibling. The idea that there may be different pathways in response to stressful life events was first conceptualized by Koos (1946) in the "roller coaster model" that described three stages that families often underwent when confronted by a stressful life event: (a) an initial period of disorganization, marked by increases in conflict and an overall atmosphere of anger and resentment, as well as a search for a means of coping with the stress; (b) a period of recovery in which the family discovered ways to adjust to the stressful event; and (c) a period of reorganization wherein the family members adapted to the stressful changes and returned to a level of functioning at or below the pre-event level. The initial increase in disruption followed by a subsequent decline reflects the potential ups and downs of a roller coaster ride and also underscores the fact that adjustment and adaptation is a change process that takes place over a period of time. Koos' (1946) model would later be refined by other family stress theorists (Hill, 1958; McCubbin & Patterson, 1983; Burr & Klein, 1994) seeking to uncover how family members adjusted to stressful life events in an effort to prevent stress from turning into a family crisis. This description of the family's adjustment and adaptation in response to stressful life events is also applicable to childhood psychopathology and understanding individual resilience in response to adversity. How is it that some children succumb to the stresses of adversity while others appear to "bounce back" and maintain a course of adaptive behavior? This understanding of the "ups and downs" surrounding a stressful transition is critical for the period of early childhood and the transition to siblinghood because of the transient nature of behavioral and emotional problems to stress, and the normative patterns so typical of early disruptive behavior (e.g., an increase in aggression in toddlerhood with a subsequent decline; see Campbell, 2011).

The idea of consecutive periods of adjustment and adaptation as critical for understanding both the family's and children's responses to stress underscores the need for longitudinal research designs that capture the increases and decreases typical of *the Adjustment and Adaptation Response (i.e., resilience)* to stress (Haan, Hawley, & Deal, 2002). Further, longitudinal data beyond a pre-birth and post birth assessment (e.g., 1 month following the birth) are critical if we wish to examine trajectories indicative of short-term adaptation and long-term, persistent difficulties reflecting maladaptation. In an effort to understand

children's resilience after the stress of the birth of a sibling, we operationalized a longitudinal pattern indicative of an adjustment and adaptation response using the five timepoints of the current research design (prenatal, 1, 4, 8 and 12 months after birth) in which an initial period of disruption and an increase in problematic behaviors (i.e., a period of adjustment) shortly after the birth (prenatal to 1 month) would be followed soon thereafter with a return to pre-birth levels of behavioral functioning (i.e., a period of adaptation) by 4 months (see Figure 1). In line with Haan et al. (2002), we are operationalizing individual resilience as a process which is visible only over time with at least three timepoints coinciding with a period before the stressful event, during the stressful event, and some time (or times) after the stressful event. A resilient child in this framework is one who evinces positive adjustment before the event, shows a period of decline during the event, but returns to pre-event levels after the event. In our case, the stressful event is the birth of an infant sibling and the firstborn's adjustment to this event is the focus for understanding resilience to a stressful life event. Resilient children are not simply immune to negative outcomes during stressful periods. Indeed, their initial reactions may be quite immediate, quite negative, and quite intense. Resilient children, however, are able to demonstrate positive adaptation in the face of adversity and risk by eventually returning to their pre-event levels of functioning. The birth of an infant sibling can bring about a period of disruption for the entire family system as a new family member is added, the family structure changes, and family members must learn to adjust and adapt to their new roles as parents, partners, and siblings.

Figure 1 also reveals other potential trajectories reflecting maladaptive or adaptive patterns of behavioral adjustment that may inform us of possible underlying processes explaining children's responses to the birth of a sibling. A *low-stable pattern of no change* would suggest that the birth of a sibling has no or minimal impact on children's behavioral functioning. A *high-stable pattern* would also indicate a pattern of no change as a result of the birth, but the high stable levels of behavior problems over time might very well indicate that family processes already underway before birth are responsible for the high levels of post-birth behavior problems. Of course, the advantages of a pre- and post-birth longitudinal design, in contrast to a post-birth retrospective design, allow one to determine if high levels of post-birth behavior problems were already evident before the birth and not necessarily a result of the birth. Another possible pattern is one of *gradual linear increase* in behavior problems over the year following the infant sibling's birth; a pattern that might occur if there was no immediate change in behavior problems resulting from the birth, but gradual increases that coincided with normative developmental changes of young infants as they progressed from sleeping to crawling to toddling. These social and motoric advances in infant development emerging gradually over time may result in more confrontations between siblings and greater opportunities for the development of disruptive behaviors (Stewart, 1990).

In addition to the Adjustment and Adaptation Response and linear patterns of change, several curvilinear behavioral trajectories may also be apparent following the birth and provide clues as to how children may be affected by the birth of an infant sibling. As depicted in Figure 2, one possible maladaptive pattern reflects sudden increases in behavior problems from prenatal to 1 month after birth that would persist over the year. This pattern

of *sudden persistent change* that does not return to pre-birth levels would reflect a non-resilient, maladaptive pattern of behavior change that would also be consistent with psychodynamic theories underscoring the birth of a sibling as a developmental crisis for the firstborn. Adler (1928) claimed that firstborn children would revert to using any means necessary to regain their parent's attention and love after being dethroned and losing their place in the family to the secondborn infant. This sudden, persistent pattern reflecting a developmental crisis would suggest that the birth of an infant sibling had both an immediate and long-term impact on children's adjustment. Another possible curvilinear trajectory might show a sudden decline in behavior problems that persisted over time supporting Dunn & Kendrick's (1982) findings that some children evinced *growth and maturity* in response to the birth by becoming more independent and autonomous. Another possibility is reflected in a *delayed impact* curve where behavior problems may remain low over the initial months, but increase suddenly in the latter half of the year as the infant transitions from a dependent, fairly immobile social partner to a walking, talking, and potentially antagonizing brother or sister. In the current study, we tested for all of these potential change trajectories using linear, quadratic and specialized contrasts in our growth models to capture the various ways children might respond to the birth of a sibling over the course of the ensuing year.

Methodological Limitations of Current Research on the Transition to Siblinghood

There are several serious limitations to the current base of studies on the transition to siblinghood that we believe the Family Transitions Study and our conceptualizations of adaptation and maladaptation can remedy (Volling, 2012). First, few developmental studies actually exist that address children's adjustment after the transition to siblinghood and there has been a noticeable gap over the years (e.g., only one study during the period from 2000 to 2011; see review by Volling, 2012). Second, most studies were conducted and published before the 1984 special issue of *Child Development* was published, in which the developmental psychopathology perspective was clearly laid out for a generation of researchers to follow (see Cicchetti, 1984; Sroufe & Rutter, 1984). None of the extant studies (e.g., Dunn & Kendrick, 1982; Nadelman & Begun, 1982; Stewart, Mobley, Tuyl, & Salvador, 1987; Gottlieb & Mendelson, 1990) was informed by a developmental psychopathology perspective, so many of these studies were focused on children's maladjustment, psychosocial crises (e.g., regression), and distress reactions to the birth of an infant sibling. Third, most studies included assessments of childhood adjustment of unknown psychometric validity, so it was impossible to know whether any changes in children's adjustment were in the non-clinical (i.e., normative) or clinical range and thus, a cause for concern. Fourth, most studies were unable to examine longitudinal trajectories of behavioral changes because many studies included mothers' retrospective, post-birth reports of change in children's problematic behaviors or only used a simple pre-birth (1 month before) and post-birth (1 month after) research design. The ability to detect different trajectory patterns after the transition was not possible because at least three timepoints, preferably more, would be needed to model complex change trajectories. Several studies (Dunn & Kendrick, 1982; Kramer & Gottman, 1992; Stewart, 1990) had repeated assessments spanning the first year and beyond, but the sample sizes ranged from 30 to 41 families and did not allow an extensive examination of individual differences in developmental change trajectories. Despite these limitations, there is some evidence

suggesting that individual differences in children's behavioral trajectories after the transition to siblinghood should be expected.

Empirical Evidence of Change Trajectories after the Birth of a Sibling

The work of Dunn and Kendrick (1982) is probably the most relevant and extensive documentation of how children fare after the transition. In this study of 41 working- and middle-class British families, older children had very different reactions to the sibling birth leading Dunn to conclude that there were wide individual differences in children's reactions and that no single indicator of adjustment could capture these differences. Dunn, Kendrick, and MacNamee (1981), for instance, found that mothers reported a range of problematic behaviors expressed by children, including clinging, withdrawal, opposition, sleep problems, toileting accidents, and feeding difficulties, and these behavioral changes ranged from rarely to frequently in the month following the birth.

Stewart et al. (1987) followed 41 two-parent families in the U.S. using the same design as the Family Transitions Study in the current report (prenatal, 1, 4, 8 and 12 months). Using maternal reports of children's anxiety, aggression and confrontations, and regressive behaviors (e.g., using baby talk, wanting a bottle or pacifier) at 1, 4, 8 and 12 months after the birth, they reported that the most frequent (i.e., normative) pattern of behavior problems (51%) was one in which children were high on all problem behaviors 1 month after the birth, high only on anxiety 4 months after the birth, with confrontations remaining high at 8 and 12 months, particularly with the sibling. An additional 12% showed a pattern where children were high on all behavior problems initially at 1 month and continued to remain high only on confrontations throughout the study. Only 10% ($n = 4$) of children evinced few problems after the birth. These initial results examining trajectories in this relatively small sample suggest that we should expect individual differences in trajectories of problem behaviors, that these trajectories may look different depending on the problem behavior being examined, and that most children were initially high on all problem behaviors examined shortly after the infant's birth at 1 month. Unfortunately, in both studies, comparable assessments of children's problem behavior before the birth were not available to know whether those children high after the birth were also high before the birth, or whether there were changes in problem behavior after the birth. Given the stability in individual differences across transitions, such as the transition to parenthood (e.g., Belsky, Spanier, & Rovine, 1983; Cowan & Cowan, 2000), it would not be surprising to see stability in individual differences in children's adjustment after the transition to siblinghood so a pre-birth assessment is critical for this determination.

Volling's (2012) recent review of the longitudinal changes in the firstborn's behavioral adjustment after the birth of an infant sibling did not find strong evidence that most children showed significant increases in problem behaviors. The few studies to date do suggest that some children may indeed have difficulties after the birth of an infant sibling, but the significant limitations of this body of research leave many unanswered questions that the current study was designed to address. The sample of the Family Transitions Study included 241 families preparing for the arrival of their second child, who were assessed initially before the birth in the last trimester of the mother's pregnancy, included information from

mothers and fathers using a well-established, psychometrically-validated measure of childhood behavior problems, the Child Behavior Checklist (CBCL: 1.5–5; Achenbach & Rescorla, 2000), followed families longitudinally over five timepoints (prenatal, 1, 4, 8 and 12 months), including an initial period shortly after birth (1 month) to capture adjustment and disorganization, and subsequent periods through the year following the birth to capture patterns of resilience and adaptation, as well as long-term persistent behavioral difficulties indicative of maladaptation and developmental crisis.

The first aim of the current study was to examine individual differences in firstborn children's emotional and behavioral adjustment using group-based trajectory analyses that would identify groups (or classes) of children showing different change trajectories starting in the last trimester of the mother's pregnancy with the second child and throughout the year following the sibling's birth. We focused on the 7 syndrome scales of the CBCL, rather than the broadband internalizing and externalizing scales, because of the documented variability in children's responses across different domains of problem behavior (see Dunn et al., 1981), as well as our ultimate goal of providing parents and professionals with recommendations for preparing for the transition. We believed it was important to specify precisely which behaviors appeared to be most problematic (e.g., aggression or anxiety), were subject to change across the transition, and might reveal different change trajectories. For instance, one could argue that different patterns of change might describe children's aggression and anxiety, which may have different consequences for children's emerging sibling relationship. Dunn and Kendrick (1982), for instance, found that it was the group of children who showed increases in withdrawal, not angry resistance, shortly after the birth who would later go on to develop problematic sibling relationships at 14 months.

A person-centered approach with longitudinal data allows the integration of several fundamental principles of a developmental psychopathology perspective: (1) the examination of normative patterns of change; (2) the search for individual differences; and (3) the documentation of different developmental pathways indicative of adaptation and maladaptation (Cummings et al., 2000). The modeling of different change trajectories that classifies individuals into groups sharing similar trajectory patterns can distinguish "normative" developmental patterns that may characterize the majority of children, but it can also identify smaller subsets of children following riskier trajectories (i.e., individual differences) indicative of maladaptation (Rutter, 1996). In a community-based sample as the one used in the current research, we would expect few children to fall in the clinical or borderline clinical ranges for problem behaviors, but nevertheless, these smaller risk groups indicative of maladaptation may be the groups we most wish to identify as targets for future intervention efforts. Therefore, even if some groups consisted of few children, we argue that these small groups are important to maintain in analyses because they may be the children displaying the most severe maladaptation after the birth and hence, deserving of closer scrutiny for purposes of identifying risk and protective factors.

Risk and Protective Factors Predicting Developmental Change

Should different groups of children be found based on different change patterns, the second goal of this investigation was to examine child (e.g., age, gender, temperament, social

understanding), parent (e.g., parental efficacy, attachment security), and family characteristics (e.g., marital quality, family stress) before the birth as predictors of different patterns of adjustment. Volling (2005) proposed the developmental ecological systems model that described changes in the older child's adjustment across the transition and identified child, parent, and family contextual factors that predicted individual differences in children's adjustment trajectories over the course of the first year after the infant sibling's birth.

The Developmental Ecological Systems Model

Volling's (2005) developmental ecological systems model to explain changes after the birth of a sibling was based on Bronfenbrenner's (1979) ecological model of human development with its focus on multiple levels of ecological contexts impinging on children and their parents, as well as family systems' perspectives with their focus on the interdependencies in family relationships, such as the marital, parent-child and sibling subsystems (e.g., Cox & Paley, 2003). In this model, the child is nested within a larger family system which, in turn, is nested within larger ecological and cultural contexts. Changes in one aspect of the environment and/or individual coincide with changes in other aspects of the ecological context. For instance, changes in children's adjustment may be due, in part, to the changes that are also co-occurring elsewhere in the family system, such as changes in the parent-firstborn relationship, the coparenting relationship, or maternal depression in the post-partum period. Rather than viewing children's adjustment as a direct function of the arrival of the newborn sibling, children's behavior may be indirectly influenced by the changes ongoing in other aspects of the family. This model also incorporates the concepts of multiple determinants (Belsky, 1984) and cumulative risk (Sameroff, 2000) in that the firstborn's developmental outcomes following the birth are related to how many individual (e.g., temperamental reactivity, maternal depression) and contextual (e.g., marital conflict) risk factors are present and changing for better or worse over time. In addition, the presence of promotive factors (e.g., father support) may offset or protect the child from experiencing significant emotional distress and behavioral difficulties (see Volling, 2005, for a thorough discussion).

Similar to the work of Belsky (1984), the developmental ecological systems framework focuses on three domains that are influential in predicting child and family adjustment across the transition to siblinghood: (a) child characteristics (e.g., temperament, age, gender); (b) parent characteristics (e.g., parenting, mental health); and (c) social-contextual characteristics (e.g., partner relationships, social support, work-family relations). Children's temperamental characteristics in the form of negative emotionality and behavioral inhibition have been related to both internalizing and externalizing behavior problems (Leve, Kim, & Pears, 2005; Williams et al., 2009) so were included in the pool of variables for our prediction analysis. Further, parenting behaviors (e.g., harsh, punitive) and parent-child attachment relationships have been linked repeatedly in prior research on children's problem behavior (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010; Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012; Mackenbach et al., 2014), as has the quality of marital interaction and more recently, coparenting (e.g., Cummings & Davies, 2011; Schoppe-Sullivan, Weldon, Cook, Davis, & Buckley, 2009) so

these family-level variables were also included. Finally, we included work-family stress and social support as social-contextual variables, as well as parental age, education, and family income as demographic characteristics. As a result, we compiled a range of child, parent, and family contextual variables that reflected the social ecology of the developing child over this transition and provided us with the means of targeting risk and protective factors for each of the individual behavioral trajectories uncovered in the following chapters. In each chapter, we review the available evidence pertaining to the specific child, parent, and family characteristics predicting children's behavioral and emotional difficulties. Our goal in the prediction analysis was to uncover targets for intervention that could be identified before the infant sibling's birth so we could eventually assist families undergoing this transition. Although we acknowledge that changes in developmental trajectories may coincide with other changes on-going in the family before and after the birth, our focus in this monograph is only on pre-birth predictors because of our overriding concern to identify and prevent problems before they occur.

Longitudinal research often follows families over extended periods of time and given the expense and length of time often required to conduct such research, it is often the case that large amounts of information are collected on family members. The Family Transitions Study is no exception. In line with the developmental ecological systems model guiding this research program, we collected large amounts of information on multiple levels of social influence (e.g., parenting, marriage, social networks, work environments) and the individual functioning of two parents (mothers and fathers) and two children (older siblings and infants) using reports from mothers and fathers. Although such an approach allows a wealth of information from which to ascertain developmental determinants of behavioral change, it also poses logistical complications for data analyses and how one should choose the best set of predictor variables from the data available. Even though we pared down the possible predictors to those child, parent, and family variables identified in prior research on young children's behavioral difficulties and the transition to siblinghood, we were still confronted with a mountain of information from which to choose (e.g., mothers' and fathers' reports of temperament for negative emotionality and behavioral inhibition). For present purposes, we relied on exploratory data mining procedures (McArdle & Ritschard, 2013) that allowed us to search for the most significant predictors of behavioral change trajectories from a large pool of possible child, parent, and family contextual predictors that were available to us at the prenatal timepoint.

Finding the "best predictors", not just any predictors, was important to accomplish the fundamental goal for developing this study in the first place; to provide a best set of practices for parents and practitioners that would help identify which areas of family life needed to be targeted with respect to sibling preparation or pre-birth interventions for children and their parents according to specific needs of the families. Further, we wanted to identify these targets before birth if possible to prevent child adjustment difficulties after the sibling's birth, rather than waiting for problems to emerge once the infant was born. Given that individual differences are the norm in describing children's reactions to a sibling's birth, a one model fits all approach to intervention may not adequately meet the needs of all families. Seidman and French (2004) provided a set of guidelines for determining whether findings supported the need for universal prevention programs offered to everyone

experiencing a developmental transition or for more selective programs tailored to the needs and risks of a specific group. Each group of families identified may have unique needs and prevention programs may need to be developed to address these specific needs. Further, different child and family factors may predict different sorts of behavioral and emotional challenges. For instance, what predicts children's withdrawal and anxiety may be different from what predicts children's aggression. By choosing *a priori* only one child (e.g., gender), one parent (e.g., attachment to mother), and one family variable (e.g., marital conflict) from our existing data set for analyses, we may find what best predicts one group, but not the other. Exploratory data mining procedures allowed us to create one pool of candidate predictors representing child, parent, and family contextual variables based on the developmental ecological systems model, and then to search systematically through all these predictors for each of the seven subscales to identify the best set of predictors for each problem behavior examined.

Developmental Consequences of Children's Adjustment for Sibling Relationships

Despite the mixed evidence on whether or not there are substantial changes in the firstborn's adjustment from before to after the sibling's birth, there is information pertaining to the development of the sibling relationship in the first year. We view the early interest in the infant and the eventual development of friendly or hostile sibling interaction over the year following the birth as an indicator of children's psychological adjustment to the transition to siblinghood (Oh, Volling, & Gonzalez, 2015; Song & Volling, 2015). Individual differences in the older siblings' reactions to the infant have consequences for the developing sibling relationship and the subsequent development of the children (Dunn, 1983; Song & Volling, 2015). It is widely acknowledged that children develop within a family context and that the quality of the children's family relationships are influential in determining young children's socioemotional development (Cox & Paley, 2003), yet few developmental studies have seriously examined the quality of young children's sibling relationships and the manner in which these relationships contribute to individual outcomes (Bedford & Volling, 2004). This is unfortunate because much of Dunn's earlier work (e.g., Dunn & Kendrick, 1982; Dunn & Munn, 1985; Herrera & Dunn, 1997; Youngblade & Dunn, 1995) documented the importance of the quality of the interaction between young siblings for the development of children's social understanding, cooperative play, and conflict-management skills. For instance, those preschool children engaged in more pretend play and more positive social exchanges with their older siblings had higher levels of emotional understanding (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Youngblade & Dunn, 1995).

Even toddlers appear to benefit from nurturant and affectionate interactions with an older sibling. Dunn & Munn (1986) reported that 2-year-old toddlers' sophisticated use of conflict and cooperative behaviors was associated with the older siblings' prosocial behavior 6 months earlier. Moreover, the quality of young children's sibling relationships remained relatively stable over time such that children with highly conflictual relationships in early childhood tended to have similar types of relationships in middle-childhood and adolescence (Dunn, Slomkowski, & Beardsall, 1994; Kramer & Kowal, 2005). Warm and cooperative

sibling relationships can be a developmental support and contribute to children's social and emotional development (Dunn, 1988). Yet, aggressive and hostile sibling relationships can be a risk factor for the development of behavior problems that can eventually lead to children's diminished social competence with peers as they enter school (Garcia, Shaw, Winslow, & Yaggi, 2000; McElwain & Volling, 2005). For instance, Tremblay et al. (1999) documented that the presence of an older sibling was a significant risk factor in predicting the developmental trajectories of highly aggressive toddlers. This is also consistent with Patterson's (1986) earlier work finding that coercive sibling relationships in preadolescence and adolescence served as a training ground for the development of aggressive behavior that was then carried over into the children's peer relationships in school.

Early sibling relationship quality appears to predict subsequent sibling relationship quality in several studies. Stillwell and Dunn (1985), for instance, found that those older siblings showing friendly behavior toward their younger 14-month-old sibling made more positive comments about the sibling approximately 3 years later when the older siblings were 6 years old. Interestingly, this friendly sibling behavior at 14 months after the infant's birth could be predicted from children's initial reaction to the newborn sibling within weeks after the sibling's birth. Older siblings who had shown a positive interest in the baby 3 weeks after the birth were also more likely to join positively in interaction between mother and the infant 14 months after the birth, whereas those older children who had initially been difficult and demanding after the birth were also more negative and demanding when mothers played with their younger sibling 14 months later (Kendrick & Dunn, 1982).

Given the developmental significance of the sibling relationship for young children's social and emotional development and the long term stability of the affective tone of this relationship beginning as early as the first 3 weeks after the infant's birth, it seems especially relevant that the earliest origins of this relationship be examined. Clearly, children's initial reactions to their infant sibling can be viewed as the earliest point in which to observe the development of the sibling relationship. Several small-scale studies have documented the affective quality of interaction between the older sibling and the infant at various timepoints throughout the first year (e.g., Dunn & Kendrick, 1982; Kramer & Gottman, 1992), yet larger, longitudinal studies are needed in order to examine what predicts stability or change in sibling relationship quality and what the developmental consequences are for both the young infant and the firstborn of having either a friendly or difficult sibling relationship at the end of the infant's first year. A final goal of this research program, then, was to determine what the consequences were for children's developing sibling relationship at the end of the first year for children experiencing different developmental trajectories of emotional and behavioral difficulties in the year following the birth. Several recent reviews find strong support of relations between the development of children's externalizing and internalizing problem behaviors, and the quality of the sibling relationship (Buist, Dekovi, & Prinzie, 2013; Dirks, Persram, Recchia, & Howe, 2015) so we expected to find similar relations between problematic sibling relationships and children's emotional and behavioral adjustment.

The Family Transitions Study

The current study is the first longitudinal examination of children's behavioral and emotional adjustment following the birth of a second child using a large sample of 241 families across five repeated assessments starting in the last trimester of the mother's pregnancy with a second child and following families throughout the year after the birth at 1, 4, 8 and 12 months postpartum. In addition to the sample size and longitudinal design, there were several other unique strengths of the study. First, the study relied on multiple informants for information on children's behaviors. Specifically, fathers' reports of children's problematic behaviors were collected at all time-points, along with mothers' reports, and used to create robust composites of behavioral change so information was not based solely on a single informant. Second, we used a well-validated and widely-used measure of children's behavioral adjustment, the Child Behavior Checklist (CBCL 1.5 – 5; Achenbach & Rescorla, 2000) to assess children's emotional and behavioral difficulties rather than relying on retrospective maternal reports or questionnaires of unknown reliability and validity. Because the CBCL has known cut-offs indicative of clinical and borderline-clinical levels of behavioral and emotional difficulties, we could examine whether changes were a cause of clinical concern. Third, the relatively large sample allowed us to take a person-centered statistical approach in which we were able to identify different patterns of intraindividual change (i.e., developmental trajectories) that were shared by groups of children. Fourth, we used statistical modeling of latent growth curves to test specific theory-driven developmental patterns of adaptation and maladaptation discussed earlier. Fifth, we used prenatal indicators of child, parent and family functioning to predict the resulting trajectories so that we could isolate those factors found to be most critical for determining risky trajectories in an effort to target intervention and prevention efforts. Finally, we used the trajectory patterns found over the transition and following year to determine whether there were ramifications for the developing sibling relationship at 12 months.

We present the methods and procedures for the study as a whole before moving on to a description detailing the statistical approach used to identify developmental change trajectories for firstborn children. In each of the chapters, one devoted to each of the seven syndrome scales of the CBCL, we review the existing literature on normative patterns and individual differences in the behavioral and emotional problems of early childhood, then move to the risks and protective factors predicting these behaviors before elucidating any links between children's problem behaviors and sibling relationship quality. It should be noted upfront that there is more information for some of these areas (e.g., aggression and sibling conflict) than others (e.g., sleep problems), and this is noted in the presentation and discussion of our findings. We then move to a presentation of the results from the growth mixture modeling of the seven CBCL subscales organizing them with respect to *externalizing* (aggression, attention problems), *internalizing* (anxiety/depression emotional reactivity, withdrawal) and *physical problems* (somatic complaints, sleep problems), with a separate chapter devoted to each. Within each chapter we present the group-based trajectories (i.e., classes) that capture the individual differences in children's adjustment, the child, parent, and family contextual variables from the prenatal timepoint that predict the different groups, and lastly, any findings linking the trajectories of problem behaviors to the sibling relationship outcomes at 12 months of age. In the general discussion, we will return

to our decision to analyze individual syndrome scales rather than the broadband internalizing and externalizing dimensions, and what we have learned about children having difficulties after the birth of their infant sibling.

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FIGURE 1.

Theorized trajectory patterns of change reflecting adjustment and adaptation, stability, and linear increase.

Figure 2.
Theorized curvilinear trajectory patterns reflecting sudden persistent change, delayed impact, and growth and maturity.