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Chapter XI. General Discussion: Children's Adjustment and Adaptation Following the Birth of a Sibling

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There were three major aims to the work presented here. First, we examined individual differences in children's adjustment after the birth of an infant sibling. By using information obtained from the Family Transitions Study, a longitudinal investigation with five timepoints (prenatal, 1, 4, 8 and 12 months), we explored the underlying trajectory patterns of change in children's behavior problems over the course of a year. We expected distinct patterns of change in how children reacted to the birth. Second, because we wanted findings from this research to generate evidence-based recommendations for future intervention efforts or pre-birth education classes, we utilized a series of data mining and confirmatory testing strategies that together took advantage of predictive validity and traditional hypothesis testing criteria to pinpoint pre-birth predictors of the different trajectory patterns. We also analyzed each of the seven behavioral syndromes of the CBCL--aggression, attention problems, anxious-depressed, emotional reactivity, withdrawal, somatic complaints, and sleep problems--separately because Dunn et al. (1981) claimed that a single assessment could not capture the variability in children's problematic reactions seen after the birth of a sibling. As a result, we now have a better understanding of the risk and protective factors that predicted the severity of children's emotional and behavioral problems and can discuss where to target interventions for the future. Finally, we examined whether children's adjustment trajectories had repercussions for the developing sibling relationship at the end of the first year, knowing that there is considerable stability in the quality of children's sibling relationships through childhood and adolescence. Making sure this relationship gets off to a good start not only alleviates parenting stress in the year after the birth, but has long-term developmental benefits for children (e.g., Buist & Vermande, 2014; Dunn et al., 1994).

The Search for Individual Differences

In a recent review of children's adjustment after the birth of a sibling, Volling (2012) concluded that there was far more support for individual differences in children's reactions to the transition to siblinghood (i.e., disruption, growth, and no change) than psychological maladjustment. Yet, there are few studies that have examined this important developmental transition in young children's lives and many are fraught with significant methodological and design limitations (e.g., very small samples, only two timepoints). Further, there is an overarching belief even today that the transition after the birth of a second child is going to be a difficult one for children and their parents, and they best be prepared for the jealousy and rivalry that will ensue. Take the following description, for instance, from a website designed to help parents prepare for the second child:

You're pregnant and thrilled. Junior, less so. After all, from his perspective, the little interloper's already taking your time and energy. Nothing you can do will

guarantee sibling bliss, but there are steps you can take to reassure your little one and minimize resentment..... If, despite your best efforts, your child begins acting out [address] her underlying concerns rather than the behavior itself. The new arrival is going to change her world as well as yours; it may take time, but one day she'll agree it was for the better (Boyd, 2009).

Such accounts with a focus on resentment and rivalry suggest there is some underlying psychosocial trauma that is responsible for children's difficult behavior when the infant is born and is part of the psychodynamic legacy underscoring the difficulties children will face with the arrival of an infant sibling (Adler, 1928; Levy, 1934; Petty, 1953; Winnicott, 1978). This emphasis on the dethronement of the child, the building resentment and frustration of losing parental attention, and the belief that children suffer severe maladjustment is in stark contrast to a developmental psychopathology perspective that situates the child within a family context so as to understand how child characteristics interact with family circumstances to determine behavioral and psychopathological outcomes (Volling, 2005), and is also inconsistent with the findings emerging from the present investigation.

The Family Transitions Study was designed to take a developmental psychopathology perspective to search for individual differences in children's reactions with a focus on operationalizing different patterns of change that would reflect maladjustment indicative of a psychosocial crisis model (i.e., sudden, persistent change), as well as adjustment and adaptation, using a longitudinal design with five timepoints over the course of a year in a community sample. Given the number of children with siblings (80%) and the fact that the birth of a second child is a frequent occurrence, we recruited a community-based, low-risk sample to determine whether children's problem behavior changed over the transition to siblinghood and if there were any signs of disturbance. We collected information on children's behavior problems using the Child Behavior Checklist for the 1-.5-5 year age group, which is a widely-used and validated measure of children's problem behavior with identifiable clinical cut-offs (Ivanova et al., 2010). Across all problem areas examined, there was no evidence of a pattern of long-term maladjustment after the birth of a sibling that would indicate sudden increases in problem behavior immediately following the birth that persisted over time. In fact, for most of the behaviors examined the vast majority of children were low on problem behaviors before the birth and remained low over the course of the year following the birth with little to no noticeable change. In some cases, children's behavioral and emotional problems actually declined which may reflect the gradual maturation and growth in social and cognitive functioning over the toddler years. The one exception was for aggressive behavior in which we found an adjustment and adaptation response, a sudden increase from prenatal to 1 month with a subsequent decline to pre-birth levels by 4 months. Thus, there is little evidence from the Family Transitions Study to suggest children have a maladaptive response to the transition to siblinghood and even when sudden change is apparent, it is short-lived, providing more evidence of children's resilience in the face of change than long-term problems of psychological maladjustment.

Even though most children did not experience significant change in behavior immediately following the birth, in all instances, there was evidence of different groups of children based on the growth mixture modeling. Many of these classes of children showed increases or

decreases in behavior over time, but the most striking similarity across all the subscales examined were the intercept differences (i.e., where children started prenatally), attesting to the stability in individual differences over time and the fact that children having behavioral difficulties after the birth were often the same children having difficulties before the birth. The other remarkable finding was that each of the classes identified by the GMM often fell within the specified range for nonclinical, borderline-clinical, and clinical cut-offs, which provided further confirmation that the classes of children identified were meaningful, and not just statistical anomalies or outliers. In this community-based, low-risk sample we would not expect large numbers of children in the clinical range cut-off unless the transition to siblinghood was a traumatic developmental crisis resulting in significant psychological turmoil or pathology (which it is not). The small classes with few children were always those at the extreme high end of the clinical or borderline-clinical range, never just a few children at the low-end or mid-range, and they were already at this point before the birth, suggesting that whatever was responsible for these children's extreme scores, it was already in place before the infant was born.

It is possible the prenatal scores of children's behavior problems were already elevated due to changes occurring during the mothers' pregnancy, but additional prenatal timepoints before the last trimester would be needed to rule out this possibility and to provide a further test of whether linear increases in children's emotional and behavioral problems were already underway before the infant was born. Such changes may not have been adequately captured in the current analyses with a single prenatal timepoint. Observant children are keenly aware of the physical changes of their mother's pregnancy and mothers have reported that changes in their relationships with the firstborn are already evident during the pregnancy (Richardson, 1983). Further, all women in the current study had singleton births with no known birth complications to our knowledge. The entire transition and months leading up to the birth may be more stressful if the pregnancy was difficult, mothers were on bed rest, or there were labor and birth complications (Affonso, Mayberry, & Sheptak, 1988). Such complications no doubt increase family stress and children's anxiety even before the infant is born and additional research is needed to address these issues directly.

One of the unique aspects of the current report is the search for individual differences in trajectories of children's adjustment across the transition to siblinghood based on multiple CBCL subscales of emotional and behavioral problems. Our decision, however, to examine each subscale separately may have meant we were missing the "whole child" and whether our high-risk groups were identifying the same troublesome group of children. In order to address this possibility further, we conducted a *post-hoc* analysis using cross-tabulations across the CBCL subscales looking specifically at whether children in the high-risk groups were the same children. For these analyses, we utilized the same pairings as we have throughout, looking at relations within the externalizing (aggression attention), internalizing (emotional reactivity, withdrawal, anxiety-depression) and physical (somatic complaints, sleep) symptoms domains.

For aggression and attention problems, we defined the mid-AAR-decreasing and high-decreasing classes as risk groups for the aggressive children because both fell within or reached the clinical cut-off either at prenatal or 1 month, and focused on the high-stable

class as high risk for attention problems. Four of the 5 high-stable children on attention problems (80%) did fall within the mid-AAR (2 of 18) and high-decreasing classes (2 of 8), Fisher's exact test $p < .001$. Yet, 1 of the high-stable children for attention problems fell in the low-increasing group of aggressive children. It should be noted, however, that there was much more dispersion across other classes. For instance, for the 52 mid-decreasing (i.e., moderate risk) group of children on attention problems, 5 fell in the low-increasing, 14 in the low-AAR, 23 in the mid-stable, and 5 in the mid-AAR. Of the 172 children in the low-decreasing group of children with attention problems, most ($n = 86$ or 50%) fell in the low-increasing class for aggression, 54 in the low-AAR, 21 in mid-stable, and 11 in mid-AAR revealing far more dispersion across the attention problems and aggression groups at low and moderate risk. Thus, while the few children at very high-risk for attention problems were more likely to be in the two high-risk aggressive groups, there was less association between attention problems and aggression with the more abundant numbers of children in the low and moderate risk groups.

For the three internalizing scales of emotional reactivity, withdrawal, and anxiety-depression, the picture is even more complicated. Of the 9 children in the high-increasing anxiety-depression group, 0 were in the high-decreasing group of withdrawn children, although 4 (44.4%) were in the moderate-increasing group, 3 in the low-stable and 2 in the mid-curvilinear class. Of the 4 high-risk children in the high-decreasing withdrawal group, none were in the high-risk high-increasing group of anxiety-depression, with 3 in the low-decreasing and 1 in the mid-stable. Finally, of the 8 children in the high-risk group of high-increasing anxiety-depressed children, 2 were in the low-stable, 4, in the mid-increasing, and 2 in the high-decreasing group of emotionally reactive children; 75% of high risk children were in the moderate to high risk groups, Fisher's exact test, $p < .001$. Two of the 4 high risk children in the high-decreasing emotional reactivity group were also in the high-increasing anxiety-depression group (50%), although 1 was also in the low-decreasing and 1 in the mid-stable groups. Although there appears to be some association across internalizing scales, there is clearly not a one-to-one correspondence between those children at high-risk on one internalizing scale and those children high on another.

Finally, a comparison of children across the sleep problems and somatic complaints scales found little association. For instance, the 2 children in the extreme high stable group on sleep problems actually fell in the low-stable group on somatic complaints. Of the 13 high-stable children on sleep problems, 2 were in the low-stable, 7 in the mid-decreasing, and 4 in the high-stable groups of somatic complaints.

In sum, although there is some correspondence across the CBCL subscales in the higher risk classes, as might be expected given that many preschoolers have comorbid behavioral and emotional disorders (Gardner & Shaw, 2008), enough of the children are dispersed across the different classes to suggest that for children making the transition to siblinghood, Dunn & Kendrick (1982) were correct in admonishing the use of single broadband measures of adjustment to capture the variability in children's adjustment following the birth of a sibling.

Explaining Earlier Accounts of Children's Maladjustment after the Birth of a Sibling

Given the resounding evidence from the current study that children did not undergo a developmental crisis or maladjustment response after the birth of a sibling, one is left wondering about earlier accounts of children's maladaptive responses. Much of the earlier research on the transition to siblinghood was conducted before developmental science and the study of normative developmental changes were introduced to the field of childhood psychopathology (Cicchetti, 1984). Further, early sibling rivalry studies were clearly entrenched in psychoanalytic thinking and a search for childhood disturbance (Levy, 1937; Winnicott, 1978). One of the most influential developmental theories in the last century is Bowlby's (1969) ethological theory of attachment. Attachment theory focuses on the intensely emotional nature of the young child's attachment to a primary caregiver, in most cases, the mother. Young children express attachment behaviors such as smiling, crying, and clinging in their efforts to seek proximity to and maintain contact with the attachment figure, and also experience considerable distress and upset when separated from the primary caregiver for even brief periods of time.

The effects of maternal separation on the mother-child attachment relationship are well-accepted and understood today, but this was not always the case. Indeed, the earliest documentation of the distress of young children to separation from the mother for brief and extended periods of time took advantage of a natural experiment by observing children's reactions to maternal separation when mothers entered the hospital to *give birth to a second child* and children were left either in foster care or a residential nursery (e.g., Heinicke & Westheimer, 1966; Robertson & Robertson, 1971). For instance, Heinicke & Westheimer (1966) in their study of 2-year-olds separated anywhere from 2 to 20 weeks while their mother gave birth to another child, noted that within the first 3 days after separation, children were seen crying and fretting for the parent, having difficulty sleeping during the night, refusing to partake in daily routines such as eating, dressing, and toileting, showing an increase in sucking a bottle or thumb, having more toileting accidents, attempting to establish some sort of positive relationship with alternate caregivers in the nursery, and as the separation continued, an increase in hostility. "The studies of other investigators as well as our own work had left no doubt that the normal 2-year-old child, being placed into a residential nursery, even if only temporarily, is very likely to be experienced as a traumatic event" (p. 4).

Today, there would be no question that these children's behaviors and emotional upset were due to the extended separations from caregivers and the placement in a strange and unfamiliar setting, but one must ask whether these lengthy separations from the mother at a time before attachment theory took prominence in our understanding of young children's emotional well-being seriously confounded the effects of the transition to siblinghood and the birth of an infant sibling, with the consequences of attachment, separation, and loss. Further, hospital practices in terms of the length of a stay after a birth and allowing children visitation have changed considerably over the years. Because of the active involvement these days of fathers in caregiving, it is also unlikely that children are being left in the care of

unfamiliar others while their mothers give birth to an infant sibling. Due to both theoretical and social changes over the decades, it is our contention that findings from some of the earliest studies of the transition to siblinghood reflect disturbances coinciding with disruptions in attachment, extended maternal separations, and feelings of loss due to the mother's lengthy hospitalization, and not to the actual arrival of an interloper (i.e., the infant sibling).

Uncovering the Best Predictors of Behavior Problem Trajectories for Intervention Efforts

The second overarching goal of this research program was to identify targets for intervention by identifying those prenatal indicators of child, parent, and family functioning that would best predict individual differences in our adjustment trajectories. To do so, we relied on a series of data mining analyses combined with statistical confirmation to pinpoint the best predictors of children's adjustment following the birth of their infant sibling, which are highlighted here.

Children's temperament

Characteristics of the child, namely, temperamental predispositions of negative emotionality and behavioral inhibition, were some of the most consistent predictors of children's problem behavior across the seven CBCL syndrome scales. In every case, one or both aspects of temperament predicted children's class membership, usually with children higher in negative emotionality and behavioral inhibition falling into the riskier classes (i.e., higher intercepts). Children high in negative emotionality were more likely to be in classes high in problem behavior for aggression, anxiety-depression, emotional reactivity, withdrawal, and somatic complaints, whereas children that parents described as high in behavioral inhibition were more likely to be classified as high on anxiety-depression and withdrawal before the birth regardless of the pattern of change after the transition. These findings are not all that surprising given the influential role of children's temperament, particularly negative reactivity and behavioral inhibition, in predicting children's externalizing and internalizing behavior problems across ages (Chen, Deater-Deckard, & Bell, 2014; Crawford, Schrock, & Woodruff-Borden, 2010). In an earlier report, we also found that children with difficult temperaments (high negative emotionality, low in soothability) were more likely to increase in externalizing behavior from prenatal to 1 month after the birth, particularly when coparenting between mothers and fathers was low in support and high in undermining during prenatal home observations (Kolak & Volling, 2013).

These results are also amazingly similar to those reported by Dunn & Kendrick (1982) in their study of 41 British children in the 1970's and 80's. Children described by their mothers as high in negative mood before the sibling was born increased in withdrawal, clinging, and sleep problems after the birth. Further, children high in negative mood and intensity of emotion also had increases in fears, worrying, and ritualistic behaviors by 8 months after the birth, behaviors comprising the emotional reactivity syndrome scale of the current study. These same children were also more likely to protest mother-infant interaction at 14 months, or watched mother-infant interaction, sucking their thumbs and holding comfort objects,

signs of anxiety and self-comforting behaviors. In line with recent theories positing that some children, particularly those high in negative reactivity, appear to be more sensitive to environmental changes (Belsky & Pluess, 2009), children high on negative emotionality and behavioral inhibition in the current study were more inclined to have behavioral and emotional difficulties before and after the birth of their infant sibling.

Attachment security to mother and father

The results of our work also provide support that attachment security to parents, and particularly the mother, played a role in children's externalizing behavior problems across the transition to siblinghood. In two instances, aggression and attention problems, the two subscales that comprise externalizing behaviors, children in the riskier classes (e.g., high-decreasing for aggression and high-stable and mid-decreasing for attention problems), were more insecurely attached to their mothers even before the birth of their infant sibling. Teti et al. (1996) reported overall decreases in attachment security to mothers after the birth of the secondborn, and numerous studies report significant change in the mother-child relationship after the birth of an infant sibling (see Volling, 2012), including increases in mothers' use of harsh and punitive discipline, more confrontations and prohibitions, and decreases in joint attention and play (Baydar et al., 1997; Dunn & Kendrick, 1982). It is plausible that the differences enumerated across the different classes of aggression and attention problems reported here may be due to changes in the mother-child attachment relationship once the infant was born, but it is also of interest that attachment security to mother differed across classes even before the birth. Changes in the attachment between mother and child could elicit feelings of jealousy, as jealousy is elicited when children believe their attachment relationship to their beloved parents is threatened by a rival, in this case, an infant sibling (Volling, McElwain, & Miller, 2002). Thus, children may well be reacting to changes in the mother-child relationship even before the birth and parents should be attuned to the emotional and behavioral changes taking place and make special time for their elder child.

All families in the current study were two-parent, consisting of a mother and a father, so one possible means of buffering the drastic changes in the mother-child relationship is having the emotional and physical support of the father. Indeed, we recruited two-parent families for the Family Transitions Study to test whether the children's relationship with their fathers would buffer children from emotional difficulties that might result from changes in the mother-child relationship. In only one instance, did attachment security to father emerge as an important predictor of children's somatic complaints, particularly for children high in negative emotionality. Children high in negative emotionality were more likely to be in the low-stable as opposed to the mid-decreasing class if they had higher attachment security to their fathers, underscoring the buffering role of a close father-child relationship in decreasing somatic complaints.

In some preliminary analyses, Volling, Oh, & Gonzalez (2012) reported that children with more secure attachments to their fathers than their mothers over the course of the transition had fathers who felt more efficacious in their parenting role than did mothers, and children were more likely to be engaged in positive interaction with their infant sibling later in the year after the birth. In contrast, children whose attachment security with both mothers and

fathers was low before the birth and continued to deteriorate over the transition, not only had parents who felt ineffective in their parental role, but children also engaged in more antagonistic sibling interactions. Dunn and Kendrick (1982) also asked mothers to describe how close and affectionate the father-child relationship was before the infant's birth. In those families where mothers reported the father-child relationship was exceptionally close, there was less escalation in mother-child conflict and confrontations, and a corresponding decrease in joint play between mother and child, after the birth. In the current study, we collected information directly from fathers rather than relying on maternal reports of father involvement, and also found that children's relationships with their fathers may serve a protective role in adjusting to the transition to siblinghood. Further research is clearly needed to help delineate how children's attachment security to their fathers may help support and protect them over this developmental transition.

Fathers' sense of parenting efficacy

One possibility may lie in fathering behavior itself. We did find, for instance, that fathers' confidence in their parental role, was important in preventing their children's problem behaviors in many instances. Paternal self-efficacy, particularly how confident a father felt about his ability to discipline the firstborn's misbehavior, was critically important in distinguishing the different classes of aggression. When fathers were confident, their children were far more likely to be in the low-increasing class and less likely to be in the riskier classes (e.g., mid-stable or high-decreasing) when they were not. This suggests that fathers' abilities to manage their children's behaviors and confidence in their fathering role proved important for their children's aggression after the infant's birth, a time when mothers may be busy with the newborn. From these results, we would recommend that fathers learn effective discipline practices for handling children's aggressive misbehavior, in addition to providing emotional support to the child during a potentially stressful transition. Assisting fathers with these skills and informing them of their important role in supporting their children's emotional needs can be incorporated into pre-birth education classes that will help fathers feel more effective as parents, help children manage their behavior and feel supported, and help mothers by providing childrearing support during the post-partum period after the birth of a newborn infant.

Maternal depression

Post-partum maternal depression is a cause for concern given the deleterious effects on infants, children, and families (Letourneau et al., 2012). More attention is now directed to maternal depression during pregnancy because of the potential effects on early fetal brain development via the hypothalamic-pituitary-adrenal axis (HPA) and stability in maternal depression over the perinatal period (Thomason et al., 2014). Few parents in the current study were clinically depressed, which may explain why neither maternal nor paternal depressive symptoms before the infant's birth predicted children's behavioral or emotional adjustment across the transition. These findings are in contrast to those reported by Dunn et al. (1981) who found that when mothers reported they were extremely tired or depressed 3 weeks after the birth, their children were more likely to be withdrawn. Given the significant associations between maternal and paternal depression in the perinatal period and children's adjustment difficulties, we do not want to conclude that parental mental health is

unimportant for children's adjustment across the transition to siblinghood at this time and strongly advise that future research is needed to address how parental moods, depression, and anxiety symptoms influence children's adjustment after the birth of a sibling (Gottlieb & Mendelson, 1995).

Family dynamics

It is possible that the effects of maternal and paternal depression were affecting children's adjustment indirectly through parenting stress, parental efficacy, and interparental relationship functioning, as each of these are correlates of depressed mood for mothers and fathers. In several instances, marital and coparenting dynamics predicted internalizing behaviors such as children's anxiety-depression and withdrawal, and sleep problems. When parents were engaged in more interparental conflict and reported less positive marital relations, children were more likely to feel anxious and withdrawn, and experience sleep problems. Thus, intervention efforts which focus on improving marital problem-solving skills may help couples adjust to the transition from one child to two, and, in turn, their children (Shapiro, Nahm, Gottman, & Content, 2011).

Given the sheer number of predictors available for inclusion in our analysis, it is noteworthy that the same variables emerged as the "candidate" predictors of children's problem behavior time and again: children's temperament, attachment security to parents, fathers' sense of parental efficacy, and interparental relationship functioning. The analyses did not prioritize one set of child, parent, or family-contextual variables as more important than any other, but went through systematically to test and check each one for its relevance in predicting the trajectory classes of children's outcomes. So it is noteworthy to mention those that did not emerge consistently in our analyses, including the age and gender of the children. Only in the case of anxiety-depression did the child's age predict class membership, with older children in the mid-stable class compared to the low-decreasing class. In her review of changes in children's adjustment across the transition, Volling (2012) found that younger children across studies did appear to have more behavioral difficulties than older children so it is not entirely clear why age of the child did not emerge in the current analyses as consistently as other child and family factors.

One possibility may reflect the family processes that coincide with children's age. Younger children at the time of their sibling's birth are closer in age to the infant sibling so the birth interval between children is shorter. Having two young children closer in age no doubt creates different family dynamics that may be influential for determining how children will fare. Parenting stress may be greater when trying to care for two young children, both in diapers and requiring more direct supervision and child care than an older child. Younger children at around 18-24 months are still in need of their attachment figures for a sense of felt security whereas older children of 4 or 5 years of age are more autonomous, have more advanced social understanding, and a greater ability to entertain and occupy themselves in play activities. The age of the older children was relatively large in this sample, as is typical of age differences between older and younger siblings, so restriction of range cannot account for the lack of age effects.

Gender did not emerge as a candidate predictor for any of the syndrome scales examined, nor was the gender composition of the sibling dyad related to any of the classes uncovered, which was somewhat surprising given how many sibling studies, in general, examine gender differences and make claims about the gender constellation and whether the transition is easier for boys or girls. Again, this emphasis on whether or not it makes a difference if the child is an older or younger brother or sister is a remnant of the individual psychology of Alfred Adler and the theory of birth order differences (Adler, 1928). The effects of gender, however, are not consistent across studies examining the transition to siblinghood (Volling, 2012). For instance, Nadelman and Begun (1982) reported boys were more withdrawn than girls, whereas Baydar et al. (1997) reported girls had more anxiety and depressive symptoms than boys after the birth of a sibling. These inconsistencies and others in the literature (see Volling, 2012) may be why gender and gender constellation did not emerge here as significant predictors of any of the syndrome scales.

It may be that once other candidate predictor variables enter the predictive model (whether the data mining techniques or the multinomial logistic regressions) there was no additional unique variance for age and gender to explain. Whatever the possible family processes involved, our results strongly suggest that family and child characteristics reflecting children's temperamental predispositions and family functioning are more predictive of children's behavioral adjustment after the birth of a sibling than are the age and gender of the child. As a result, intervention efforts and supports to families anticipating the birth of their second child that target these areas of family and child functioning may be far more helpful to parents than focusing on immutable characteristics such as the child's age or gender at the time of the birth that parents are unable to change. Assisting parents to learn how to manage children's disruptive behavior, to identify early signs of anxiety and withdrawal, and to work together as coparents may be particularly promising for parents of the most challenging children who are feeling less efficacious in their abilities to manage disruptive or anxious behaviors.

Other family variables that were not significant in predicting class membership included work-family stress, which Stewart (1990) claimed was particularly important for many fathers as they increased their work hours after the infant's birth. The division of household and childcare labor, and social support from family and friends were also not consistent predictors of the different trajectories of behavior problems. It is quite possible that these variables are more predictive of children's adjustment at different timepoints after the birth, for instance, to explain concurrent behavior from child and family functioning at the same point in time (e.g., 1-month parenting stress predicts sleep problems at 1 month). The fact that these other family-level variables did not emerge as prenatal predictors from this analysis does not mean they are unimportant or do not contribute to family functioning over time and, in turn, children's behavioral and emotional difficulties. What it does mean is that if we wish to assist children and families having difficulties on the seven constructs assessed by the CBCL over the course of the year following the transition and need a quick means of identifying what discriminated those children having difficulties from those children who did not in order to maximize the effects of intervention before the birth, we would recommend focusing on more proximal family processes that involve the child's

relationships with parents and the parents' relationship with one another than on other extra-familial supports.

Early Sibling Interactions: Friends or Foes?

Because the earliest reactions to the arrival of the infant sibling predicted the quality of early sibling relationships (Dunn & Kendrick, 1982), and there is continuity in sibling relationship quality throughout childhood and adolescence (Dunn et al., 1994), we were also interested in whether or not children's behavioral adjustment in the year following the birth might have ramifications for the relationship developing between the siblings at 12 months. Our results suggested that sometimes it did and other times it did not. The CBCL trajectories of aggression, attention problems, and emotional reactivity significantly predicted children's interactions with their 12-month-old sibling with more conflict and less positive sibling involvement with children higher on these problems. Not surprisingly, the syndrome scales most reflective of psychosomatic or physical symptoms (e.g., somatic complaints, sleep) did not predict children's interactions with their younger sibling. These findings are in contrast to the earlier results of Dunn & Kendrick (1982), who reported that children's early withdrawal after the birth predicted problematic sibling relationships nearly a year later. Instead, we found it was the externalizing scales of aggression and attention problems that were related to sibling relationship quality at 12 months. We do not want to rush to conclude, however, that children's initial anxiety and withdrawal are not relevant to subsequent sibling relations. Based on observations of children's initial reactions to their parents' interactions with their infant siblings at 1 month, Volling et al. (2014) found that children who were approach-avoidant (i.e., withdrew and avoided interaction) had higher scores on all of the CBCL syndrome scales at 4 months after birth than children who were willing to join positively and play nearby. Further, children's trajectories of the internalizing dimension of emotional reactivity in the current analyses were also significantly related to sibling relations at one year providing evidence that understanding how children react to the transition to siblinghood and knowing how to prevent children's behavioral and emotional difficulties will provide parents with the knowledge needed to scaffold their children's relationship with their younger sibling and put the relationship on firm ground for future success.

Limitations and Caveats

Despite the many strengths of the Family Transitions study, there are several limitations that needed to be noted. First, families were predominantly middle- to upper- middle class, two-parent, and relatively low-risk with respect to adversity and family background. We must also acknowledge the low response rate for participation of the eligible families and the fact that families of more difficult children and those undergoing more family stress may have declined participation, leaving us with a less representative and better functioning sample. The use of a community-based, low-risk sample that was not screened for childhood externalizing or internalizing disorders could, however, be seen as a strength as it means the results from the current research are more generalizable to the broader population of families, at least those with similar demographics, undergoing the transition from one child to two. Given the overarching focus on psychosocial trauma and disordered behavior

prominent in this area of research, examining low-risk, community-based samples would seem to be a good starting point when addressing the adjustment outcomes for children undergoing one of the most significant developmental transitions of early childhood. Nearly 80% of families in the U.S. have two or more children so living with a sibling and going through the transition to siblinghood is a frequent occurrence for many families, many of whom are middle-class. Cowan and Cowan (2000) also noted that families do not have to be from high-risk backgrounds and undergoing significant adversity to experience difficulties across a normative transition and, as a result, be deserving of assistance. In fact, the problems faced by second-time parents may often be overlooked or minimized because of the inherent belief that they know all there is to know about raising an infant, having done so once before (Mercer, 1979). Yet, second-time mothers often have different concerns, generally focused on their relationship with the older child, how this relationship will change, whether they can love two children the same, and feeling guilty about destroying the first child's life (Jordan, 1989; Mercer, 1979). Regardless, future research is still needed to replicate our findings both in community-based samples and higher risk families from different backgrounds.

One of the strengths of the current study was the longitudinal nature of the research with five timepoints across the transition and for a year after the birth, including a pre-birth assessment point. Many prior studies often relied on mothers' reports after the birth asking them to recount what had changed since the infant was born, which can be particularly problematic during a stressful transition where changes in the mother-child relationship are many (e.g., increased confrontations, prohibitions, decreased attention) and parents are adapting to their new roles caring for two children. Even though we had longitudinal data spanning the time from before to a year after the birth, and used prenatal variables to predict our change trajectories, we are not able to determine the direction of effects because the initial assessment of the CBCL trajectories and the predictors were both obtained at the prenatal timepoint. It is possible that parenting and family characteristics in place before the birth were responsible for children's problematic behaviors, but it is also possible that more difficult children create more parenting stress and family conflict. We acknowledge the correlational nature of our design and the constraints it imposes on the interpretation of our results. We hope our findings spark additional interest and research in this important, but under-studied, aspect of young children's development. The current analyses were designed specifically to examine prenatal predictors with the goal of offering recommendations for pre-birth intervention, but future analyses are needed that can follow the transactional relations between child behavior, parenting, and family context in order to uncover developmental processes that unfold over time.

We believe the analysis strategies we employed in the current report were appropriate for the questions we addressed; (1) to identify different developmental trajectories of children's behavior (growth mixture modeling fixing the classes), (2) to examine the prenatal antecedents that predict these trajectories (data mining using random forest and CART variable selection with standard hypothesis testing criteria in a multinomial logistic regression), and (3) to determine whether there are consequences for the developing sibling relationship by the end of the first year (restricted maximum likelihood regression). These analytic strategies, although relevant for our goals, are exploratory and the results must be

replicated in other samples. Because the literature base for the transition to siblinghood is both scarce and quite dated, and because this is the first large-scale ($n = 241$) longitudinal study to include mothers' and fathers' reports on an established measure of children's problem behaviors to address changes in children's adjustment from a developmental psychopathology framework, we had little information from which to generate hypotheses. We believe the results from our exploratory analyses provide some of the first systematic evidence of individual differences in developmental trajectories across the transition to siblinghood and we invite future investigators to use the information provided here to formulate and test additional hypotheses about children's adjustment after the birth of a sibling.

Finally, we utilized multiple methods in the current study when available, including observations of parent-child, coparenting, and marital interaction during the prenatal home visits, Attachment Q-sorts obtained from mothers and fathers, assessments of children's sociocognitive understanding, and both mothers' and father's self-reports of child, parent, and family functioning. Yet, our primary measurement of children's adjustment, although a widely used and validated measure of emotional and behavioral disorders in young children (Achenbach & Rescorla, 2000), was based on parental reports and not actual home observations of children's behaviors. We aggregated across parents in order to increase construct validity and to reduce the possibility of a single-reporter bias, at a time when parents and children are having to adjust to the stresses and changes surrounding the birth of a new infant. Further, given the nature of some of the problem behaviors examined, it is unlikely that home observations could be conducted that would be lengthy enough to observe the occurrence of low frequency events or provide access to periods of the day to observe some behaviors (e.g., sleep problems). This is often why researchers rely on parental reports for such information. Still, we must acknowledge that our results may have differed had we used observed or other measures (e.g., actigraphy, sleep diaries) rather than parent-reported measures of problem behaviors.

Overall Conclusion

Individual differences in developmental trajectories of children's behavioral and emotional adjustment were evident after the birth of an infant sibling for all problem areas examined—aggression, attention problems, anxiety/depression, emotional reactivity, withdrawal, somatic complaints, and sleep problems. The inclusion of a pre-birth assessment clearly showed that many children were similarly low or high on emotional and behavioral difficulties before the birth and with the exception of aggressive behavior, there was little evidence that children showed an abrupt change in their behavior with the birth of the infant sibling. These behavioral trajectories of different problematic behaviors were predicted by a common set of child and family variables (e.g., temperament, attachment security, father's parental efficacy, marital and coparental relationship functioning) that are potential targets for intervention before the transition to siblinghood. Finally, the different trajectories of aggression, attention problems, and emotional reactivity predicted how well children related to their younger sibling at the end of the first year. Findings suggest that early patterns of behavior problems after the birth have implications for the developing sibling relationship, which can be predicted already by child, parent, and family factors prior to the birth. The

birth of an infant sibling may exacerbate problems already apparent in the family system consistent with a family systems and developmental psychopathology perspective, but there is little evidence to suggest that most children experience clinically significant levels of psychopathology as a result of the sibling's birth or that children's behaviors are a result of psychological conflicts brought on by feelings of resentment, dethronement, or displacement. Indeed, most children experience little to no disruption after the birth of their infant sibling, and when immediate changes were apparent, as was the case with aggression, it only characterized children from riskier family situations, was short-lived, and was resolved by 4 months after the birth, providing more support for childhood resilience than childhood disturbance after the birth of an infant sibling.

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