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## VII. Developmental Trajectories of Children's Emotional Reactivity after the Birth of a Sibling

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## **VII. Developmental Trajectories of Children's Emotional Reactivity after the Birth of a Sibling**

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Emotional reactivity in the current chapter refers to children's moodiness, worrying, emotional instability, and their inability to emotionally cope with new situations (Achenbach & Rescorla, 2000) rather than a temperamental characteristic. Emotionally reactive children often have difficulties adapting to change and are described as moody and anxious. Because the birth of a sibling is considered a significant change within the family, emotionally reactive children may become increasingly emotionally labile after the birth. During the transition to siblinghood, Stewart (1990) reported that children experienced an increase in emotional intensity, a decrease in the range of mood expressions, and an increased tendency to approach rather than withdraw from social interaction in the year following the infant's birth. The likelihood of whether children have problems with emotional reactivity after the sibling's birth was contingent on whether children were described by mothers as

emotionally reactive prior to the birth. Dunn and Kendrick (1982) reported that emotionally reactive children prior to the birth were either emotionally reactive after the birth or actually increased in emotional reactivity in the first 8 months following the sibling's birth. These findings provide support for the accentuation principle, where life stressors accentuate the individual's preexisting psychological traits prior to the life event, in this case, the birth of an infant sibling (Elder & Caspi, 1988; Volling, 2012). Dunn and Kendrick (1982) argued that the change in children's miserable moods and worrying was not simply a matter of age-related developmental change because these behaviors increased only from one month before the birth to 8 months after, and not from 8 to 14 months, when the family had already adjusted to the birth. Thus, there is some evidence to suggest that we might see an adjustment and adaptation response for children's emotional reactivity, with an immediate increase in emotional reactivity that either declines or stabilizes shortly afterward.

### *Development of Emotional Reactivity in Early Childhood*

Emotional reactivity and regulation are key aspects of development in early childhood. Although trajectories of emotional reactivity as a behavior problem have not been widely investigated, developmental components of emotional reactivity (e.g., worrying, moodiness, emotional intensity, instability) have been studied in prior research. For instance, children's emotional instability tends to decrease from 4 to 7 years (Bandon, Calkins, Keane, & O'Brien, 2008), whereas worrying increases with age in young children from 3 to 7 years (Muris, Merckelbach, Gadet, & Moulaert, 2000; Muris, Merckelbach, Meesters, & van den Brand, 2002; Vasey, Crnic, & Carter, 1994) possibly as a result of children's increasing cognitive development (Grist & Field, 2012; Lagattuta, 2007). About half (48.2%) of children aged 3–6 years from a normative, nonclinical sample reported worrying (Muris et al., 2002), and children's top worries included separation from parents, dying or death of others, burglars, and personal harm (Muris et al., 2000). Individual differences in children's moodiness and emotional intensity, however, tend to remain stable between 3 and 4 years (Hinde, Stevenson-Hinde, & Tamplin, 1985). Furthermore, emotional problems during the 0–5 year age range are often considered temporary reactions to stressful life events (such as the transition to siblinghood) rather than enduring emotional disorders (Gardner & Shaw, 2008), once again, underscoring the possibility of a short-lived emotional reaction to the stresses surrounding the birth of an infant sibling.

### *Individual Differences in Young Children's Emotional Reactivity*

Individual differences in emotional reactivity exist among children (Bandon et al., 2008). Different children have varying reactions to new situations that might be stressful and elicit strong emotions. For example, some children may cry and protest during the first day of preschool, whereas other children may be gleeful and energetic. Only one study has examined individual differences in trajectories of emotional reactivity in children from 4 to 7 years (Bandon et al., 2008). Although emotional reactivity decreased, on average, from 4 to 7 years, there was substantial heterogeneity in both the intercept and slope that was predicted by mothers' characteristics (Bandon et al., 2008). Children experienced slower declines in emotional reactivity from 4 to 7 years if their mothers were more depressed and engaged in more negative parenting behavior. The authors reasoned that children's greater

emotional reactivity was due, in part, to modeling negative affect from their mothers, indicating a strong role of the family environment on children's emotional reactivity over time. Based on these earlier findings, we also hypothesized there would be individual differences in children's trajectories of emotional reactivity following the birth of a sibling, with children showing either an adjustment and adaptation response indicative of an immediate, but short-lived, stress response to the birth or a decline in emotional reactivity. In any event, we expected children's initial scores before the birth to differ and define individual differences in children's trajectories of emotional reactivity over time.

### ***Risk and Protective Factors in the Prediction of Early Emotional Reactivity***

In the context of the transition to siblinghood, difficult temperament plays a key role in the development of emotional reactivity problems after the birth. Children with difficult temperaments at the prenatal timepoint were more likely than nondifficult children to have increased fears, worries, and moodiness 8 months after the birth of their sibling (Dunn & Kendrick, 1982). Several studies have focused on components of emotional reactivity (e.g., moodiness or worry) or internalizing behavior (of which emotional reactivity is a component). In line with the developmental ecological systems framework (Volling, 2005), both personal characteristics of the child and parent characteristics can contribute to emotional reactivity problems during the transition to siblinghood.

Because many mood disorders are heritable, parental psychopathology has been studied as a risk factor for children's internalizing behavior problems. Links between parental depressive symptomology and children's behavioral problems, including internalizing behaviors, are well established, but effect sizes also tend to be small (see meta-analyses: Connell & Goodman, 2002; Goodman et al., 2011). Mothers' depressive symptomology also appears to be a stronger predictor of children's internalizing problems than fathers' depression (Connell & Goodman, 2002). Parental depression is likely related to children's emotional problems through two pathways: genetic heritability and environmental risk. Parents with depressive symptoms are less likely to provide sensitive care and fewer emotion regulation strategies to their children, which, in turn, could increase children's emotional problems. Therefore, parental depression and associated risks in parental behaviors may create additional risks in the family environment that potentiate changes in children's emotional reactivity during the transition to siblinghood.

Children learn to regulate their emotions through the support of their parents (Calkins, 1994). Sensitive parents tend to use emotionally supportive strategies that help children regulate their emotions (Thompson & Meyer, 2007), thus, managing emotional reactivity and their abilities to cope with emotionally charged situations. But, parenting stress may negatively impact parents' sensitivity to their children. Stressed parents are less likely to provide sensitive and nurturing care to their children, and more likely to be overreactive and harsh with their children. Children, in turn, may either model this negative affect or become dysregulated by it (Blandon et al., 2008; Liu & Wang, 2014). Mothers' parenting stress has been linked to children's greater internalizing behaviors and emotional reactivity problems (Hart & Kelley, 2006; Renk, Roddenberry, Oliveros, & Sieger, 2007; Tharner et al., 2012). For instance, Hart and Kelley (2006) reported that both mothers' and fathers' parenting stress uniquely predicted internalizing behaviors in 1- to 4-year-old children.

The transition following the birth of a second child may exacerbate parenting stress for both mothers and fathers as they attempt to balance the care of a newborn infant and an older sibling, which, in turn, may increase children's emotional distress in response to changes in family routines.

In addition to links between children's temperamental characteristics and their emotional reactivity problems (Dunn & Kendrick, 1982), the development of social-emotional understanding appears to be key in the continuity or discontinuity of internalizing problems in childhood. Children's perspective-taking abilities allow them to use others' emotional states to guide their own interpersonal interactions. Children with more advanced emotional understanding and socio-emotional responding may be better at regulating emotional responses, but children's socio-cognitive understanding can operate as a protective factor in some contexts and as a risk factor in other contexts (Keenan & Shaw, 1997). For instance, empathy may lead to feelings of sympathy and prosocial responding in interactions with peers (Eisenberg & Fabes, 2006), but should children become overwhelmed with others' emotions and experience personal distress, they may "over-internalize" both others' and their own emotional problems, and develop internalizing behavior problems as a result (Keenan & Shaw, 1997). Therefore, children with better emotional understanding may be better at understanding the feelings of others, which may help them cope with the emotional changes transpiring across the transition, but they may also become emotionally reactive and increase in their worrying and inability to cope should the stresses become overwhelming during the transition to siblinghood.

#### *Sibling Relationships and Early Emotional Reactivity*

Children's emotional reactivity can potentially affect their family relationships (Hinde & Stevenson-Hinde, 1988). Emotionally reactive children who are more sensitive to both the positive and negative emotions of others may be more adept at developing positive and cooperative relationships with siblings, but also have more difficulties managing emotionally salient interactions. On one hand, children with positive emotional intensity may tend to seek interpersonal interaction, but the instability of their emotional reactions could result in frequent positive and negative interactions with other family members (Hinde & Stevenson-Hinde, 1988; Hinde et al., 1985). For example, moody, irritable, sulky children elicited more adult interaction (Hinde et al., 1985), and moody firstborns had frequent hostile and negative interactions with their siblings (Hinde & Stevenson-Hinde, 1988). Moody children controlled their siblings and incurred adult hostility (Hinde & Stevenson-Hinde, 1988; Hinde et al., 1985). Therefore, if firstborns are too emotionally reactive, they may try to control their sibling's behavior and engage in negative interactions, resulting in more sibling conflict and less sibling cooperation 12 months after the sibling's birth. Thus, we hypothesized that children high in emotional reactivity would engage in more conflict and less positive interactions with their siblings 12 months after the sibling's birth.

**Results**

*Individual Differences in Trajectories of Emotional Reactivity*

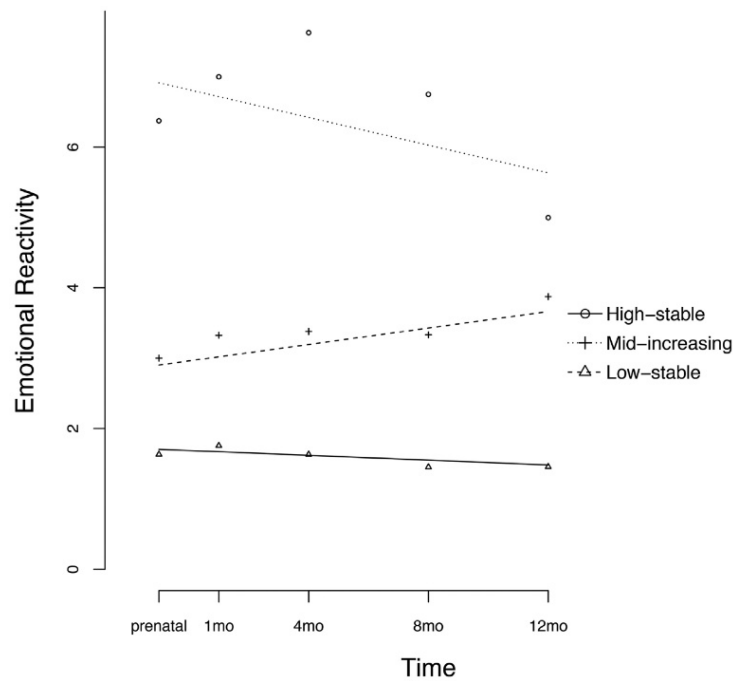
As noted in chapter III, the unconditional latent linear model fit the emotional reactivity data better than the unconditional Adjustment and Adaptation Response and quadratic models. Although the overall sample exhibited no average change in emotional reactivity over time, there was variability around the growth parameters, supporting the search for individual differences in trajectories. Based on the GMM, we determined that a three-class model best described the different change trajectories because it had lower fit indices, AIC = 3,226.69, BIC = 3,281.63, LMR-LRT = .013, than the two-class model, AIC = 3,241.76, BIC = 3,286.41. Further, there was no significant improvement in the four-class model, AIC = 3,224.31, BIC = 3,289.55, LMR-LRT = 0.689. The three-class model also had higher entropy (0.793) than the four-class model (0.745). Table 10 shows the growth parameters for the three classes, which were used to interpret the trajectory patterns, and Figure 7 displays the overall trajectory patterns for each of the three classes.

**Table 10.** Growth Mixture Model Results for Emotional Reactivity: Parameter Estimates and Standard Errors for Fixed Effects

Classes Parameters	Low-Stable <i>n</i> = 167 (73%)	Mid-Increasing <i>n</i> = 58 (25%)	High-Stable <i>n</i> = 4 (2%)
Intercept	1.704*** (.112)	2.902*** (.227)	6.914*** (.686)
Linear slope	-.034 (.018)	.117** (.043)	-.197 (.103)

**Note:** Standard errors in parentheses. The random effect (variance) of intercept est. = .718, *SE* = .126, *p* < .001; the random effect of linear slope est. = .007, *SE* = .004, *p* = .098.

\*\* *p* < .01, \*\*\* *p* ≤ .001



**Figure 7.** Trajectory classes for emotional reactivity from Growth Mixture Model ( $N = 230$ )

Most children fell into a *low-stable* class, 73% of the sample ( $n = 167$ ). The low-stable class had relatively low levels of emotional reactivity at the onset and showed stability over time consistent with the hypothesized stable trajectories in Figure 1 of the [issue] Introduction. The second class comprised 25% of children ( $n = 58$ ) and was labeled the *mid-increasing* class because children had moderate levels of emotional reactivity at the prenatal time-point and increased over time. The third, much smaller class (2%,  $n = 4$ ) displayed a *high-stable* pattern of emotional reactivity, with higher scores than other children that remained stable over time. Although smaller in comparison to the other classes, these children fell squarely in the borderline clinical range cutoff across the entire year substantiating the uniqueness of this small group of children (spaghetti plots can be found in Figure S3 of the supporting information online). These plots also revealed that all children in the low-stable class fell below the mean on the emotional reactivity scale. Children in the mid-increasing class had scores above the normative mean, with some children close to the borderline clinical cut-off (92.5%), but none of these children hit the clinical range cut-off (97%), and most children in the mid-increasing class were below the borderline clinical range cut-off.

### ***Predicting Emotional Reactivity Trajectories***

Five variables (mothers' parenting stress, children's negative emotionality, children's emotion understanding, children's behavioral inhibition, and fathers' attitudes about physical punishment) emerged as candidate predictors of the emotional reactivity trajectories from the variable selection and data mining analyses. The reduced multinomial logistic regression model with additive main effects using the low-stable class as the reference group was

used to interpret findings because the multinomial logistic regression that included all possible higher-order interactions between the predictors did not significantly predict the classes better than the reduced model with only main effects,  $LR\ Chisq(52) = 47.56, p = 0.65$ .

Table 11 presents the results of the multinomial logistic regression showing that mothers' parenting stress, children's emotion understanding, and children's negative emotionality were unique predictors of class membership. As mothers' parenting stress and children's emotion understanding increased, there was an increased likelihood of children being in the mid-increasing group compared to the low-stable group. As children's negative emotionality increased, there was an increased likelihood of the child being in the high-stable group relative to the low-stable group. Using the mid-increasing group as the reference group in an exploratory analysis yielded additional insights. As children's negative emotionality increased, the more likely they were to be in the high-stable group relative to the mid-increasing group,  $b = 4.06, z = 2.32, p = .02$ .

**Table 11.** Results of Multinomial Logistic Regression Analysis Examining Class Differences for Children's Emotional Reactivity Problems with the Low-Stable Class as the Reference Class

Predictor	Low-Stable vs.	<i>b</i>	<i>SE</i>	<i>z</i>	<i>p</i>	<i>OR</i>
Children's negative emotionality	Mid-increasing	0.52	0.30	1.74	n.s.	1.68
	High-stable	4.58	1.75	2.62	0.009	97.57
Children's behavioral inhibition	Mid-increasing	-0.05	0.18	-0.30	n.s.	0.95
	High-stable	0.40	0.71	0.57	n.s.	1.50
Children's emotion understanding	Mid-increasing	0.12	0.06	2.17	0.03	1.13
	High-stable	0.22	0.21	1.02	n.s.	1.24
Mother-reported parenting stress	Mid-increasing	1.04	.37	2.82	0.005	2.82
	High-stable	-0.16	1.40	-0.12	n.s.	0.85
Fathers' physical punishment	Mid-increasing	-0.22	0.12	-1.81	n.s.	0.80
	High-stable	-0.54	0.50	-1.09	n.s.	0.58

**Note:** n.s. = nonsignificant, OR = odds ratio

### *Consequences of Children's Emotional Reactivity for Sibling Relationships at 1 Year*

We conducted regression analyses to test whether children's emotional reactivity trajectories predicted siblings' positive involvement, conflict, or avoidance 12 months after the infant was born. Membership in the high-stable class relative to the low-stable class predicted more conflict with the infant sibling at 12 months,  $b = 0.56, SE = 0.27, p = .039$ . Emotional reactivity trajectories did not predict positive involvement or avoidance of the infant sibling at 1 year.

### **Discussion of Children's Emotional Reactivity Trajectories**

Findings revealed that although there was no evidence of change, on average, for the entire sample, there was heterogeneity among children's emotional reactivity trajectories after the birth of their sibling. We identified three trajectory patterns. The largest class, consisting of 73% of the sample, had low emotional reactivity during the prenatal period, which continued to be stable across the year following the infant's birth. The second class with



25% of children had moderate levels of emotional reactivity prior to the birth of the infant that subsequently increased during the year. The smallest class, only 2%, had the highest levels placing them in the borderline clinical cut-off range for emotional reactivity during the prenatal period that continued over time. Overall, however, there was no evidence of a sudden, persistent change pattern in children's emotional reactivity problems during the transition to siblinghood that would indicate maladaptation and also no evidence of an adjustment and adaptation response, suggesting a short-term stress reaction to the changes of the transition.

Our results are partially consistent with previous findings on changes in children's miserable moods and worrying during the transition to siblinghood (Dunn & Kendrick, 1982) and consistent with previous work that found stability in children's moodiness and emotional intensity between 3 and 4 years of age (Hinde et al., 1985). Because there are no age-related changes in emotional reactivity within the early preschool years, any exhibited changes are most likely in response to stressful life events (Gardner & Shaw, 2008), such as the transition to siblinghood.

Whereas previous research found that children's intensity of emotional expression increased after the birth of a sibling if they were emotionally intense beforehand (Dunn & Kendrick, 1982), we found that children's emotional reactivity increased after the transition if they had moderate levels of emotional reactivity before the infant's birth, whereas children who were in the borderline clinical range and high on emotional reactivity prior to the birth remained high over time. Differences between our results and previous findings may be due to measurement differences across facets of emotional reactivity or to sample size differences across the studies. Previous research examined intensity of emotional expression separately from other indicators of worrying and moodiness (Dunn & Kendrick, 1982), whereas we examined behaviors that combined moodiness, worrying, emotional instability, and ability to emotionally cope with new situations as facets of emotional reactivity.

Children's emotional reactivity trajectories were uniquely predicted by mother and child characteristics. We found that children with greater emotional understanding and whose mothers reported more parenting stress prenatally were more likely to be classified into the mid-increasing class relative to the low-stable class. Further, negatively emotional children were more likely to be classified into the high-stable class compared to the mid-increasing and low-stable classes. Consistent with previous work linking children's difficult temperament and emotional reactivity during the transition to siblinghood (Dunn & Kendrick, 1982), we also found that children high on negative emotionality were also more likely to evince problems with emotional reactivity during the transition to siblinghood, as their scores placed them in the borderline clinical range of emotional reactivity problems (i.e., high-stable class).

Children with greater emotional understanding may be more aware of the changes that come with the infant sibling's birth. Children in the mid-increasing emotional reactivity group had higher emotion understanding than children in the low-stable group. According to developmental social-information-processing models, emotionality and emotion regulation are central to creating children's social schemas and social behaviors (Crick & Dodge, 1994; Lemerise & Arsenio, 2000). Thus, children with greater emotion understanding may

also have stronger emotional reactions and act accordingly. These children may be more cognitively aware of the social changes within the family and become more emotionally reactive (within normative levels) as the transition to siblinghood progresses. Although children in the mid-increasing class had greater emotional understanding, being part of the mid-increasing class was not predictive of sibling outcomes. It may be that children's other family relationships are impacted during the transition to siblinghood. For example, Teti, Sakin, Kucera, Corns, and Eiden (1996) found that older children (2–5 years old) experienced declines in security of mother-child attachment, but younger children (under 24 months) did not. Teti et al. hypothesized that age-related changes in mother-child attachment were a result of older children having advanced social-cognitive skills compared to younger children. They further hypothesized that children's advanced emotional understanding enabled children to feel threatened and displaced by a new baby. Thus, children's emotional understanding may predispose them to be more emotionally reactive as family interactions increasingly involve the developing infant sibling.

Mothers' parenting stress may also contribute to these children's increases in emotional reactivity over time, as children in the mid-increasing group had mothers with greater parenting stress. Mothers reporting more parenting stress may engage in more hostile or overreactive parenting, which may place their children at risk for the development of problems with emotional reactivity either through modeling of mother's negative affect or from emotional dysregulation resulting from less emotionally supportive parenting during times of stress (Liu & Wang, 2014). Mothers were already reporting feeling hassled on a regular basis with the children during the prenatal timepoint, and these hassled and stressed mothers may have responded to their children differently before and after the birth than mothers who were less stressed. Hassled and stressed mothers may be more critical, irritable, and harsher toward their children, which, in turn, decreases their children's abilities to emotionally cope with the changes occurring during the transition and as a result, increases their children's worry and moodiness. A mother-child relationship characterized by harshness and parental overreactivity may create a dynamic that increases children's emotional reactivity before and after the birth of an infant sibling.

Although previous meta-analyses have established links between maternal and paternal depression with children's internalizing problems (Connell & Goodman, 2002; Goodman, et al. 2011), maternal depression did not increase the risk of children's emotional reactivity in the current study, which may be due to a few different factors. First, our sample was a low-risk community sample, and few parents had depression scores in the clinical range. The limited variability in parental depression may be one reason depression did not exert a significant impact on children's emotional reactivity problems after the birth of a sibling. Second, because depression is also associated with maladaptive parenting in both mothers and fathers (Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Wilson & Durbin, 2010), parenting stress and parenting behaviors may mediate the link between maternal depression and children's emotional reactivity during the transition. Because young children experience parenting behaviors directly and are indirectly influenced by their parents' depression via parenting, maladaptive parenting (e.g., parenting stress, physical punishment) likely overshadowed any potential effects of depression on children's emotional reactivity in this study. Although fathers have been theorized to play a role in children's

adjustment after the birth of a sibling (Stewart, 1990), we did not find that fathers' characteristics were uniquely predictive of children's emotional reactivity in the current research. It should be noted, however, that fathers' endorsement of physical punishment emerged as a candidate predictor of children's emotional reactivity in the variable selection procedures but was not a unique predictor of children's emotional reactivity above and beyond the other variables in the more conservative multinomial logistic regression analysis. Thus, fathers' physical punishment may play some role in explaining individual differences in children's emotional reactivity after the birth of a sibling, but more research is needed to address this possibility. Given that parents' use of corporal punishment is linked with detrimental child outcomes, including more internalizing problems (Gershoff & Grogan-Kaylor, 2016), fathers who spank their children may be exacerbating child difficulties across the transition, especially when in conjunction with greater maternal parenting stress and harsh parenting. Children who experience harsh parenting and physical punishment from both parents may be especially vulnerable to behavioral and emotional difficulties during the transition.

Children's emotional reactivity trajectories predicted sibling conflict but not avoidance or positive involvement with the infant sibling at 1 year. Specifically, children classified in the high-stable class were more conflictual with their siblings by the end of the first year after their sibling's birth than children classified in the low-stable class. These results can be interpreted as a function of the negative components of emotional reactivity (i.e., emotional instability, difficulty adapting to new situations). Children in the high-stable class were more emotionally reactive and may be more easily provoked in conflict situations, making it difficult for them to disengage or avoid their infant siblings. Note that the different emotional reactivity trajectories did not differ on positive sibling relations, suggesting that they are as likely to engage in cooperative and friendly interactions with their siblings as children in the low-stable and mid-increasing groups, but these positive exchanges are occurring within the context of high levels of sibling antagonism. Put another way, these children have sibling interactions that are marked by ambivalence (Dunn, 1983), with both positive and negative interactions with their siblings. By the end of the first year, these children have developed a sibling relationship with higher levels of sibling antagonism in addition to positive sibling interaction, which may give rise to sibling collusion processes over time (Oh et al., 2015). These results on sibling conflict, however, should be interpreted cautiously because they involve comparisons with the small high-stable class, which included only four participants.

In sum, the trajectories of children's emotional reactivity revealed that there are relatively stable patterns of behavior over the transition and that children high on emotional reactivity prior to the birth of a sibling were also relatively high afterwards. The vast majority of children fell into a low-stable class well within a normative, nonclinical range of behavior, suggesting that most children have few to no emotional reactivity difficulties in response to the impending birth of their infant sibling. Children, whose mothers were more stressed and hassled about parenting responsibilities prenatally, were more emotionally reactive and actually increased in their emotional reactivity after the birth of a sibling. These findings underscore the fact that parenting stresses (with the firstborn) experienced

by mothers during the pregnancy with the second-born may set in motion a family dynamic that gives rise to increased emotional reactivity before and after the birth. It is also possible that emotionally reactive children create additional burdens and stresses for parents. No doubt the process is probably bidirectional, with emotionally reactive children creating more parenting stress, which, in turn, contributes to children's feelings of emotional insecurity, worrying, and reactivity over time, and future work would be well advised to consider investigating these developmental processes.

Children with better emotional understanding before the birth were also more likely to be emotionally reactive and increase in their emotional reactivity over time (i.e., mid-increasing) than children in the low-stable class. Because children with better emotional understanding are more prone to emotional problems through an over-internalization of others' and one's own distress (Keenan & Shaw, 1997), perhaps children with better emotional understanding are more attuned to the emotional climate of the family and are better able to comprehend the impending changes that accompany the birth of a sibling. Finally, children in the high-stable class of emotional reactivity were not only characterized by greater negative emotionality, but were also at-risk for developing conflictual interactions with their siblings 1 year after the birth, which is not surprising given prior research finding that children high in negative emotionality are more involved in sibling conflict and have higher internalizing and externalizing behavior problems (Dirks et al., 2015). Given the predictive utility of early sibling conflict for later sibling conflict (Dunn et al., 1994), and the links between sibling conflict and other negative developmental outcomes for children and adolescents (e.g., externalizing and internalizing problems; Buist et al., 2013), these highly emotionally reactive children, although few in number, may be potentially at-risk for later developmental difficulties.

**Note:** For those interested in the statistical code used to analyze these data (including growth mixture models, random forest, and CART procedures), please email Richard Gonzalez at [gonzo@umich.edu](mailto:gonzo@umich.edu)

### **Author Biographies**

Patty X. Kuo, Ph.D., is currently a post-doctoral research associate in the Department of Anthropology at the University of Notre Dame. She received her Ph.D. in Developmental Psychology at the University of Michigan. Her research interests focus on father involvement in families with infants and young children from a biopsychosocial perspective.

Brenda L. Volling, Ph.D., is Professor of Psychology, and Director and Research Professor of the Center for Human Growth and Development at the University of Michigan. Her research focuses on the role of family relationships for early social and emotional development. She is the Principal Investigator of the Family Transitions Study, a longitudinal investigation of child and family functioning after the birth of a second child, which provided the data for the present monograph.

Richard Gonzalez, Ph.D., is Professor of Psychology, Statistics, and Integrative Systems & Design; Research Professor in the Research Center for Group Dynamics and the Center for Human Growth and Development; and Director of the Research Center for Group Dynamics. He is also Director of the Biosocial Methods Collaborative. His research is in the area of judgment and decision making. He is interested in applied statistical models, longitudinal designs, data mining techniques, and research designs that integrate biological and behavioral processes.

Wonjung Oh, Ph.D., is an Assistant Professor of Human Development and Family Studies at Texas Tech University. Her research focuses on the role of individual, relational, peer, and family factors in developmental trajectories of adaptive and maladaptive social behavior and relationships. She actively seeks novel, innovative approaches to basic and applied research questions pertaining to developmental and family processes across various transitions.

Tianyi Yu, Ph.D., is an associate research scientist at the Center for Family Research, University of Georgia. She received her Ph.D. in Human Development and Family Studies at Auburn University, and was a former post-doctoral fellow on the Family Transitions Study. Her major research goal is to identify factors and processes associated with resiliency and vulnerabilities in children as well as young adults who experience family stress and transitions.

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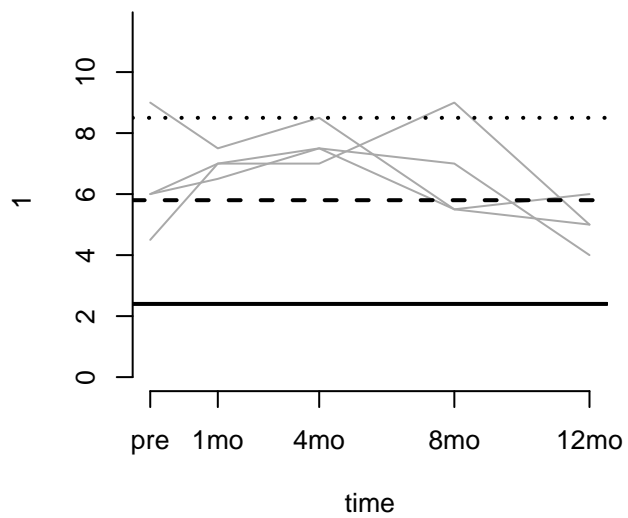
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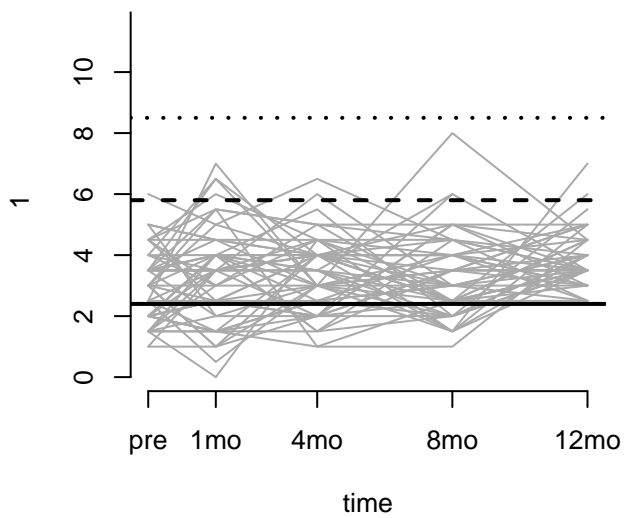
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# Supplemental Information

## High-stable



## Mid-increasing



## Low-stable

