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Chapter IX. Developmental Trajectories of Children's Somatic Complaints After the Birth of a Sibling

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The transition to siblinghood is a time of adjustment and change for some children (Dunn et al., 1981). Given the substantial empirical research that links stress with somatic complaints in children (Eminson, 2007), it seems likely that children experiencing the birth of a younger sibling might develop somatic complaints in response to this stressful change in family composition. Although several studies have documented somatic complaints during early childhood as a stress response (see review in Eminson, 2007), research that directly examines somatic complaints in children as a response to the birth of a sibling is lacking. We address this gap by examining trajectories of change in children's somatic complaints during the immediate transition to siblinghood and throughout the first year after the birth of the sibling.

Development of Somatic Complaints in Early Childhood

Young children with somatic complaints may manifest their distress in different ways. Recurrent abdominal pain without organic causes, headaches, and limb pain are the most common forms of somatic complaints for very young children (Galli et al., 2007; Egger, Costello, Erkanli, & Angold, 1999; Campo & Fritsch, 1994), with stomachaches more common among children ages 3–5 years old (Borge, Nordhagen, Moe, Botten, & Bakketeig, 1994; Eminson, 2007; Domènech-Llaberia et al., 2004). The prevalence of somatic complaints is generally low in early childhood (J. E. Beck, 2008), with 8–9% of preschoolers having recurrent abdominal pain and only 2–3% of preschoolers having persistent headaches (Domènech-Llaberia et al., 2004; Zuckerman, Stevenson, & Bailey, 1987).

Somatic complaints can also manifest as disruptions in eating behavior, nausea, aches, diarrhea, musculoskeletal pains, dizziness, fatigue, or constipation ((Achenbach & Rescorla, 2000; Egger et al., 1999). For many children, somatic complaints in early childhood appear to be an adjustment reaction to a stressor or disruption in children's normal routines (Eminson, 2007). The lack of empirical work that directly examines children's somatic complaints in the context of the transition to siblinghood makes strong conclusions difficult; however, results from a single study suggest two intriguing findings that help to conceptually guide the present study. Children over the age of 4 did not show many complaints around toileting or eating disruptions (e.g., regression to less age-appropriate eating behaviors) after the birth of a sibling, yet younger 2- to 3-year olds in the sample manifested problems with toilet training and normal eating habits in the year following the birth (Stewart et al., 1987; Stewart, 1990). Younger children may not behave this way intentionally, but the increased problems with eating and toileting may be a direct result of anxiety after the birth. By 4

months after the birth, Stewart (1990) found that difficulties with toileting were greatly reduced and disruptions in eating habits were reduced in the 2- to 3-year olds. This finding suggests that by 4 months, children adjusted to the new family structure and no longer exhibited toileting issues or eating disruptions (Stewart, 1990). High levels of anxiety, however, were still present at 4 months after the birth, so it may manifest in other behaviors. Given the paucity of research on children's adjustment to the birth of a sibling, however, any broad conclusions remain speculative.

Several studies have assessed the prevalence of somatic complaints during the period of early childhood, without specific attention to the transition to siblinghood, and found that children often experience somatic complaints in two ways: as a short-term distress reaction (Eminson, 2007; Wolff et al., 2009) or long-term functional somatic symptoms, defined as physical symptoms of unknown pathology (Beck, 2008; Dhossche, Ferdinand, van der Ende, & Verhulst, 2001; Steinhausen, 2006). Somatic complaints are common as an adjustment reaction to stress in young children and indeed make up the largest and most recognizable group in a pediatric or primary care setting (Eminson, 2007). In contrast to some of the other maladaptive behavior problems in this monograph, somatic complaints are often short-lived, present as a single complaint or a small number of complaints, usually do not cause functional impairment, and do not typically reach clinical levels (Eminson, 2007). Thus, somatic complaints of this type appear to be more transitory than persistent across development in response to stress. Given that somatic complaints in early childhood are considered normative only if the complaints are short-lived, the longitudinal trajectories for children whose complaints do not subside are of great interest. We would expect based on the current literature that it would be far more common for children to manifest an adjustment and adaptation response with an immediate increase from prenatal to 1 month and a subsequent decline by 4 months than a pattern of sudden and persistent maladjustment after the birth of their infant sibling.

In contrast, long-term functional somatic symptoms are associated with comorbid psychiatric symptoms, such as anxiety and depression, as well as a high degree of functional impairment (J. E. Beck, 2008; Garber, Zeman, & Walker, 1990; Walker & Greene, 1989). Wolff et al. (2010) reported that somatic complaints in toddlers were associated with increased internalizing and externalizing behavior problems in adolescence. Thus, although somatic complaints generally present as a short-term adjustment reaction, it appears that early somatic complaints that do not subside may predispose children for salient problems later in life.

Individual Differences in Young Children's Somatic Complaints

Though few studies have examined individual differences in somatic complaints across children, Mulvaney, Lambert, Garber, and Walker (2006) found that individual differences in somatic complaints do exist. In their five-year longitudinal study of somatic complaints, three different trajectories for somatic complaints were identified, particularly recurrent abdominal pain in children (ages 6–18): a low-risk group (70%), a short-term risk group (16%), and a long-term risk group (14%). The majority of children fell within the low-risk group and initially showed low levels of impairment, improved within 2 months, and

maintained their improvement 1 and 5 years later. The short-term risk group initially had the highest level of symptoms but improved considerably during the following months and maintained that improvement at year 5. The final group, the long-term risk group, displayed high levels of somatic complaints across time that did not improve. Additionally, the long-term risk group displayed significantly lower self-worth, more depression and anxiety, and more negative life events. Such results indicate that even though the majority of children with somatic complaints had low-level symptoms and improved over time, the children with high levels of somatic complaints who did not improve over time warrant further attention, due to their vulnerability to both somatic complaints and other mental health outcomes, though it is unclear if similar results would be evident for very young children.

Risk and Protective Factors in the Prediction of Early Somatic Complaints

Utilizing the developmental ecological systems perspective (Volling, 2005), risk and protective factors for the development of somatic complaints in young children are grouped according to child characteristics, parental characteristics, and environmental factors. Children's temperament has been strongly associated with the development of somatic complaints in young children. Fearful temperament and temperamental falling reactivity, which refers to the rate of recovery from peak frustration or distress, have been found to increase the likelihood of children's somatic complaints at 18 months of age (Wolff et al., 2010). Rocha and Prkachin (2007) also found that children's negative mood, withdrawal, and adaptability at age 5 were related to increased somatic complaints at age 12. Children at 18 months who reacted fearfully to new people were more prone to develop somatic symptoms than nonfearful children (Wolff et al., 2009).

Parenting characteristics represent another set of key risk factors for the development of somatic symptoms in children. Maternal somatic symptoms and depression or anxiety have been associated with higher reported somatization in their children (Wolff et al., 2010; Domènech-Llaberia et al., 2004; Galli et al., 2007). Walker, Garber, & Greene (1993) found that boys in families with a high incidence of negative life events (e.g. negative changes in family relationships, health, employment) and whose mothers expressed high levels of somatic complaints had higher levels of somatic complaints themselves, which indicated that children may learn by modeling maternal anxious behavior and mood, or attending to internal physiological symptoms and sensations.

Additionally, parenting stress (Wolff et al., 2010) and maternal insensitivity to child cues have been associated with the development of children's somatic complaints (Grunau, Ruth, Whitfield, Petrie, & Fryer, 1993). These results are consistent with the family systems approach, which maintains that somatic complaints may function as a communication attempt or a "cry for help" by the child (Campo & Fritsch, 1994). According to this perspective, this communication attempt may be particularly evident in families that have poor parent-child communication and/or poor parent-child and coparental relationships (Aro, 1989; Aro, Paronen, & Aro, 1987). Because mother-child relationships change across the transition to siblinghood with increases in harsh and punitive discipline and decreases in joint attention and play (Volling, 2012), these changes may manifest as somatic complaints in the child.

Family risk factors are also associated with the development of somatic complaints in early childhood. Marital tension and conflict, as well as general family tension, have been associated with somatic complaints in children (Grunau, Ruth et al., 1993; Wolff et al., 2009; Terre & Ghiselli, 1997). Consistent with emotional security theory, repeated exposure to interparental conflict over time may result in greater child emotional reactivity (Davies, Sturge-Apple, Winter, Cummings, & Farrell, 2006). Indeed, rather than acclimate to exposure to marital conflict with less reactivity, children are often sensitized to marital conflict and demonstrate increased emotional and physiological reactivity with repeated exposure (Goeke-Morey, Papp, & Cummings, 2013; Zemp, Bodenmann, & Mark Cummings, 2014), which may manifest as somatic complaints. Other family stressors, such as occupational changes or work-family stress for an immediate family member were also significant risk factors for somatic complaints in children (Boey & Goh, 2001). Therefore, it appears that early exposure to stressful environments, family stressors, and/or negative life events, increased the risk of somatic complaints in both clinical and community samples of young children (J. E. Beck, 2008). As such, we would expect some children to manifest somatic complaints after the birth of a sibling, particularly in families with increased levels of parenting stress, marital conflict, and work-family stressors.

Sibling Relationships and Early Somatic Complaints

No empirical research currently exists that has examined the relation between somatic complaints and the emerging sibling relationship, and it is not clear whether such a link should exist. It seems unlikely that symptoms of somatic complaints would affect the sibling relationship given how highly individualized somatic complaints are in response to stress.

The current study aims to elucidate further knowledge on somatic complaints during the transition to siblinghood by examining children's trajectories of somatic complaints across the year following the birth of a sibling, and investigating predictors of the identified trajectories. We hypothesized that most children with few difficulties with somatic complaints before the birth of a sibling would maintain that trajectory after the birth. We also hypothesized, however, that some children with few difficulties prior to the birth might manifest somatic complaints after the birth as an adjustment reaction to the possibly stressful event of the birth of a sibling. With respect to sibling relationships, our hypotheses were exploratory given lack of any prior empirical evidence.

Results

Individual Differences in Trajectories of Somatic Complaints

Having ascertained in Chapter III that the unconditional linear model best fit the somatic complaints data, we used growth mixture modeling (GMM) to estimate linear patterns of somatic complaints trajectories across the five timepoints. The GMM analysis indicated a three-class model with a linear growth factor best described the different change trajectories within the sample because it had better fit indices, AIC = 32140.7, BIC = 3195.79, LMR-LRT = .116, than the two-class model, AIC = 3163.86, BIC = 3214.55, LMR-LRT = .014, and the four-class model, AIC = 3125.61, BIC = 3190.93, LMR-LRT = .168; the three-class model had higher entropy (.864) than the four-class model (.829). Table 14 presents the

fixed effects of each class and Figure 9 shows the different trajectory patterns for the three classes.

The largest class was denoted as the *low-stable* class and represented 60% of the sample ($n = 138$). Children in this class showed the lowest level of somatic complaints at the prenatal timepoint that remained low throughout the following year. All children in the low-stable class fell below the normative mean (bottom line) on the somatic complaints scale (see spaghetti plots in supplemental materials). A second class was labeled as the *mid-decreasing* class, accounting for 35.2% of the sample ($n = 81$), and showed moderate levels of problems at the prenatal timepoint with a gradual linear decrease throughout the 12 months after the birth of the sibling. The spaghetti plots of individual trajectories showed that majority of children in the mid-decreasing group had scores above the normative mean, but below the borderline cut off range (92.5%). The final class, the *high-stable* class, comprised only 4.8% of the sample ($n = 11$), but showed the highest levels of somatic complaints at the prenatal timepoint and remained high throughout the year, with most children falling within the borderline clinical range (92.5%) and some exceeding the clinical cutoff (97%; plots can be seen in Figure 5 of the supplemental materials). Patterns were also consistent with the linear and stable patterns denoted initially in Figure 1 in the Introduction.

Predicting Somatic Complaint Trajectories

Based on the variable selection methods, four variables emerged as candidate predictors of the three classes: children's negative emotionality, positive marital relationship quality, children's attachment security to the father, and the mothers' parental efficacy. The full multinomial regression model using the low-stable class as the reference class with all higher order interactions had significantly better fit than the reduced model with main effects, $LR \text{ Chisq} (df=22) = 39.16, p = .014$, so we report the results of the main effects using the main effects only model and the two-way interactions using the full interaction model.

Odds ratios and z-tests in Table 15 indicate that child's negative emotionality significantly predicted differences between the high-stable class and the low-stable class, and between the mid-decreasing class and the low-stable class. Children with higher negative emotionality were more likely to be in the mid-decreasing or high-stable class relative to the low-stable reference class. Positive marital relationship quality significantly predicted a higher probability of being in the low-stable class relative to the mid-decreasing class. Additionally, mother's reports of feeling less efficacious as a parent were associated with a greater probability of being in the high-stable class relative to the low-stable reference class.

Interaction effects—In addition to the main effects, there was one 2-way interaction and two 3-way interactions that emerged from the full logistic model that predicted class membership with the low-stable class as the reference class. The z tests, odds ratios, coefficients, and standard errors for the three interactions of the multinomial logistic regression analyses using the low-stable class as the reference class are presented in Table 15. Due to the complexity of the 3-way interactions and the likelihood of spurious findings due to our sample size, we will only interpret the 2-way interaction.

Children's negative emotionality x attachment security to father predicted decreased chances of being in the mid-decreasing class relative to the low-stable reference class. Children with low negative emotionality and low levels of attachment security to fathers were more likely to be in the mid-decreasing class. Children with high levels of negative emotionality and high levels of attachment security to fathers were more likely to fall in the low-stable class. At moderate levels of negative emotionality and high levels of attachment security to fathers, children were more likely to be in the mid-decreasing class relative to the low-stable class.

We also conducted exploratory multinomial logistic regressions using other classes as the reference class, due to our interest in assessing differences between classes that reflect different levels of clinical significance. Using the mid-decreasing class as the reference class, mother's reports of feeling less efficacious as a parent predicted an increased probability of being in the high-stable class relative to the mid-decreasing class, $b = 3.22$, $z = 2.97$, $OR = 25.02$. Utilizing the high-stable class as the reference class did not reveal any additional significant results.

Consequences of Children's Somatic Complaints for Sibling Relationships at One Year

Results of the regression analyses using the trajectory classes to predict siblings' positive involvement, conflict, or avoidance at 12 months were all nonsignificant relative to the reference class (low-stable).

Discussion of Children's Somatic Complaints Trajectories

In this chapter, we assessed the overall pattern of children's somatic complaints after the birth of a new sibling, and the subgroups that captured individual differences in somatic complaints. We also examined the predictors of these trajectories and tested whether distinct trajectory subtypes were associated with differences in sibling relationship outcomes when the second child was one year of age.

In contrast to our original prediction that children experiencing the birth of a younger sibling might develop somatic complaints in response to this stressful change in family composition, children in the current study showed an overall linear decrease in somatic complaints over the year rather than an adjustment and adaptation response or a pattern of sudden and persistent change indicative of maladjustment. Although previous work indicated that somatic complaints are often seen as a short-term stress response (Eminson, 2007), our work indicates that young children do not appear to evince an increase in somatic complaints in response to the transition to siblinghood, at least based on parental reports using the CBCL. Instead, we found that 66% of the sample (low-stable) were low and remained low in somatic complaints over the transition and the year following the sibling's birth. An additional 35% of children fell into a mid-decreasing class where they had moderate levels of somatic complaints before the birth, but actually declined after the birth. Finally, only 5 % of children were in the high-stable class where their somatic complaints were high and remained high over time. Our results strongly suggest, as is the case with other problem behaviors examined in this monograph, that children's post-birth behavior is often a direct result of their pre-birth behavior. Children high on somatic complaints after the birth are the same children high on somatic complaints before the birth. It is possible that the transition to

siblinghood is less stressful for children than popular notions lead us to believe, or that children's pre-birth scores are already a reflection of stress building in the family before the arrival of their infant sibling. We would need more assessment points before the third trimester of the pregnancy to be able to determine whether this was the case, but our current findings do not find strong evidence of change in children's somatic complaints from the last trimester of their mother's pregnancy to a year after the birth.

Consistent, however, with evidence in the literature that children's negative mood and difficult temperament were related to higher somatic complaints in young children (Rocha & Prkachin, 2007), children's temperament, particularly their negative emotionality, played a significant role in the prediction of the different trajectories of somatic complaints in children experiencing the transition to siblinghood. Children high on negative emotionality prior to the birth of the infant sibling were more likely to be in the mid-decreasing and high-stable class relative to the low-stable class.

Children's negative emotionality was also a significant moderator of family risk as demonstrated in the significant two-way interaction between children's temperament and attachment security to the father. Emotional security theory suggests that the family environment, specifically the interparental relationship, influences how secure a child feels within the home, which, in turn, influences children's emotionality, emotion regulation, and the development of psychopathology (Davies et al., 2006). The results from our study indicate support for emotional security theory as well as potentially more complex family systems processes. With respect to the negative emotionality and attachment security to father interaction, attachment security to fathers appeared to play a relevant role in reducing children's somatic complaints after the transition to siblinghood. Children high in negative emotionality with greater attachment security to their fathers were more likely to be in the low-stable class compared to the mid-decreasing class, whereas children with lower attachment security with their fathers and moderate negative emotionality were more likely to be in the mid-decreasing class. These results suggest attachment insecurity to the father, even when negative emotionality is low, may increase children's anxiety, which is a known predictor for somatic complaints (Wolff et al., 2010).

Previous research on adolescents and adults supports this anxiety hypothesis. Ciechanowski et al. (2002) found that adult attachment style was significantly associated with somatic symptom reporting in women with preoccupied or fearful attachment. Stuart and Noyes (1999) explained that somatization may be a maladaptive strategy learned by children with insecure attachments as a way to satisfy their attachment needs, and a similar explanation may account for the current results linking attachment security between fathers and children with somatic complaints after the birth, particularly for negatively emotional children. Given that mothers may be more occupied with the care of the infant in the early months, some children may rely more on the emotional support of their fathers after the birth of their infant sibling, which may explain why the attachment security to father, and not to the mother, was more important in predicting children's somatic complaints. More research is needed to test these interpretations directly.

Our findings regarding marital relationship quality and parental efficacy also provide support for emotional security theory. High positive marital quality may act as a protective factor for children (e.g., increased emotional security), as children with parents who reported more positive marital relationships were likely to be in the low-stable class of somatic complaints. Such results suggest that when mothers and fathers are engaged with their marriages and put forth effort into sustaining the quality of marital communication and constructive problem-solving (Cummings & Davies, 2002), children may feel more emotionally secure in times of stressful change such as the transition after the birth of a sibling, thereby avoiding the development of somatic complaints.

In addition to the marital relationship, children also fared better when their mothers felt more confident in their parental efficacy. Children with mothers who felt less efficacious in parenting the older child and responding to their misbehavior were more likely to belong to the high-stable class rather than the low-stable or mid-decreasing classes. Given the link between lower parental efficacy and poor parenting practices and discipline (Sanders & Woolley, 2005), it is possible that mothers with a greater sense of parental efficacy were better at providing consistent discipline and helping their child to self-regulate at an early age, and, in turn, decrease rates of somatic complaints. It is also possible that mothers were unable to influence the high-stable children's somatic issues and felt less efficacious as a result.

Finally, with respect to the relation between somatic complaints and sibling outcomes, we found no significant results for any of our predictors based on children's trajectory classes, which is not surprising as it is not entirely clear why children's physical symptoms and somatic complaints would affect their interactions with an infant sibling, other than perhaps to limit their involvement.

In summary, the potential stress or adjustment period associated with the infant sibling's birth did not appear to act as a catalyst for increased somatic complaints in children. Indeed, there were overall decreases in somatic complaints, which may reflect the decline in somatic symptoms that occurs over the early period of childhood. Although there was individual variability in children's somatic complaints in the current community-based sample, most children, as expected, fell into the low-stable class with far fewer children falling in the mid-decreasing and high-stable class. Both child and family characteristics predicted children's somatic complaint trajectories following the birth of a sibling. In this regard, children's negative emotionality was a prominent predictor of class membership, particularly in combination with attachment security to father. Although the scarcity of previous literature that directly examines the development or prevalence of children's somatic complaints during the transition to siblinghood makes robust conclusions challenging, it appears that the development of somatic complaints in this time period is not an immediate reaction to the birth of the sibling, but may be due instead to complex interactions between both individual characteristics of the children and the changing family context.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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FIGURE 1.
Theorized trajectory patterns of change reflecting adjustment and adaptation, stability, and linear increase.

FIGURE 9.
Trajectory classes for somatic complaints from Growth Mixture Model ($n=230$).

Table 14

Growth Mixture Model Results for Somatic Complaints: Parameter Estimates and Standard Errors for Fixed Effects

Classes	Low-stable	Mid-decreasing	High-stable
Parameters	n = 138 (60%)	n = 81 (35.2%)	n = 11 (4.8%)
Intercept	.837 *** (.079)	2.58 *** (.120)	4.976 *** (.331)
Linear slope	-.016 (.016)	-.087 ** (.030)	-.078 (.088)

Note. Standard errors in parentheses. The random effect (variance) of intercept est. = .053, $SE = .081$, $p > .05$; the random effect of linear slope est. = .008, $SE = .004$, $p = .060$.

*
 $p < .05$,

**
 $p < .01$,

***
 $p < .001$.

Table 15

Results of Multinomial Logistic Regression Analysis Examining Class Differences for Children's Somatic Complaints with the Low-Stable Class as the Reference Class

Predictor	Low-stable vs.	b	SE	z	p	OR
Main Effect Model						
Child negative emotionality	Mid-decreasing	.91	0.28	3.19	0.001	2.48
	High-stable	1.69	0.77	2.19	0.029	5.44
Positive marital relationship quality	Mid-decreasing	-0.59	0.20	-2.96	0.003	0.55
	High-stable	-0.45	0.41	-1.11	n.s.	0.64
Attachment security to father	Mid-decreasing	0.26	0.77	0.33	n.s.	1.29
	High-stable	-2.90	1.64	-1.78	n.s.	0.05
	High-stable	2.60	1.07	2.44	0.015	13.42
Full Interaction Model						
Child negative emotionality x attachment security to father	Mid-decreasing	-6.39	1.93	-3.30	0.001	0.002
	High-stable	4.18	7.08	0.59	n.s.	65.30
Child negative emotionality x attachment security to father x positive marital relationship quality	Mid-decreasing	-5.38	2.18	-2.47	0.013	0.005
	High-stable	1.43	6.86	0.21	n.s.	4.16
Child negative emotionality x attachment security to father x mothers' parental efficacy ^a	Mid-decreasing	-15.13	5.74	-2.63	0.008	0
	High-stable	-28.85	15.76	-1.83	n.s.	0

Note. n.s. = nonsignificant. OR= Odds Ratio.

^a higher scores indicate lower sense of efficacy as a parent