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Chapter VIII. Developmental Trajectories of Children's Withdrawal After the Birth of a Sibling

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Dunn and Kendrick (1982) reported that some children became withdrawn after the birth of their infant sibling and Nadelman and Begun (1982) also reported an increase in children's lying around from before to 1 month after the transition. What is important to note is that it was the withdrawn children who would later go on to develop poor sibling relationships at 14 months after the birth, not the children who acted out and expressed their frustration and anger (Dunn & Kendrick, 1982). Therefore, understanding socially withdrawn behavior after the transition to siblinghood is an important focus for the current study given its predictive significance for subsequent sibling relationship quality.

Development of Withdrawal in Early Childhood

Social withdrawal is the behavioral tendency to isolate oneself from others and it is moderately stable from early childhood through adolescence (Caspi et al., 2003; Degnan, Henderson, Fox, & Rubin, 2008; Rubin, Coplan, & Bowker, 2009). Withdrawn children spend most of their time playing alone and on the periphery of the social scene, often due to anxiety or distress provoked in those contexts. Behavioral inhibition, an early precursor and manifestation of social withdrawal, is biologically-based wariness (Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Rubin et al., 2009), is found in approximately 15%–20% of infants (Kagan, 1997), and is predictive of social withdrawal in early childhood (Rubin et al., 2009). Inhibited infants and toddlers display socially wary, withdrawn behaviors when they encounter novel situations and they are unlikely to show spontaneous positive social initiation in unfamiliar peer groups (Rubin, Hastings, Stewart, Henderson, & Chen, 1997). For example, behavioral inhibition among 2-year old toddlers was a significant predictor of withdrawal at four years (e.g., (Kagan, Reznick, & Snidman, 1988; Rubin, Burgess, & Hastings, 2002) and high levels of behavioral inhibition and withdrawal were stable across infancy and early childhood (Fox, Henderson, Rubin, Calkins, & Schmidt, 2001). Rubin, Chen, McDougall, Bowker, and McKinnon (1995) found that approximately two-thirds of children identified as extremely withdrawn at five years remained withdrawn through eleven years of age. Further, social withdrawal in childhood is a significant risk factor for internalizing problems such as anxiety and depression in childhood and adolescence (Lane & Song, 2015).

Individual Differences in Young Children's Withdrawal

A growing body of research has demonstrated heterogeneity in the longitudinal progression of withdrawal (Booth-LaForce & Oxford, 2008; Eggum et al., 2009; Oh et al., 2008). Although extant literature on withdrawal has shown moderate stability and continuity in childhood (Fox et al., 2001; Kagan, Reznick, & Snidman, 1987; Rubin et al., 1995), not all

inhibited infants and toddlers are withdrawn and socially anxious later in life (Degnan & Fox, 2007). Some children display withdrawn behavior as a sign of distress in response to stressful life events (e.g., a move, birth of a sibling), but they are often short-lived and transient (Campbell, 2006). For example, Mathiesen and Sanson (2000) examined behavior problems among young Norwegian children from 18 to 30 months and found that shy and fearful children had short-lived transitory patterns of adjustment problems (e.g., eating, sleeping, dependency and attention seeking, mood, worries, and fears), whereas children who were aggressive and overactive-inattentive had more stable adjustment problems over time.

The transition to siblinghood may be especially stressful for young, socially wary and behaviorally inhibited children because the arrival of the infant sibling may exacerbate family stress and challenge these children's abilities to cope with the stress. To date, there is no study examining change patterns of social withdrawal across the year following the birth for young children undergoing the transition to siblinghood. Dunn and Kendrick (1982) found that children who initially showed no interest and affection toward the baby at 1 month after the birth were more likely to be socially withdrawn and to interact less with the infant sibling at 14 months after the birth. They argued that withdrawn children may have a difficult time accepting the arrival of the sibling and adjusting to their infant sibling's birth. In fact, children's withdrawal after the arrival of a sibling was concurrently associated with an unfriendly attitude toward the sibling shortly after the infant's birth, and was longitudinally predictive of poor sibling relationship quality 14 months after the birth.

Risk and Protective Factors in the Prediction of Early Withdrawal

Literature on the etiology of social withdrawal suggests that both child characteristics and parenting contribute to developmental patterns of social withdrawal. For example, some studies have reported links between children's temperament, the quality of parent-child relationships, and the development of social withdrawal (see Rubin et al., 2009 for a review). Based on the developmental ecological systems perspective (Volling, 2005), we discuss child, parent, and family contextual variables as risk and protective factors of social withdrawal across the transition to siblinghood.

Children's temperament has been implicated as important for understanding their behavioral difficulties after the birth of a sibling. For instance, Dunn and Kendrick (1982) reported that children with negative emotionality showed an increase in withdrawal after the birth. In general, children's temperamental reactivity, including physiological and behavioral responses to stimulation, was a significant predictor of shyness (Lane & Song, 2015) and socially reticent behavior in infancy and early childhood (Kagan, 1997; Rothbart, Sheese, Rueda, & Posner, 2011). Four-month-old infants with reactive temperaments were more distressed, and showed fear and withdrawn behavior when they encountered novel objects or unfamiliar events at 1 and 2 years of age than less reactive infants (Kagan, 1997; Kagan & Snidman, 1991). Relatedly, Fox and colleagues (2005) suggested that shy, anxious and fearful temperamental dispositions resulted in the expression of social withdrawal later in development.

Both individual parent characteristics, such as depression, and parenting behaviors have been associated with children's maladaptive social behavior. Children of depressed mothers were more likely to develop internalizing behavior problems (i.e., low activity, unresponsiveness, and elevated shy-sensitivity) compared to children of non-depressed mothers (Campbell, Matestic, von Stauffenberg, Mohan, & Kirchner, 2007; Cummings & Davies, 1994; Field, 1992; Mathiesen & Sanson, 2000). Mothers' and fathers' parental self-efficacy at 1 month after the infant's birth predicted the older sibling's antagonistic behavior as well as avoidance of the infant sibling later in the year following the birth (Oh et al., 2015), suggesting that when parents did not feel competent in their abilities to respond to their children's misbehavior shortly after the birth, children were more socially withdrawn and aggressive toward their sibling later in the year.

Parenting behavior has also been related to children's social withdrawal. Parents of socially withdrawn children are often overprotective and intrusive due, in part, to parents' perceptions that their withdrawn children are socially vulnerable and in need of protection; thus, they use overly solicitous and protective or intrusive parenting (Rubin et al., 1995; Coplan, Hughes, Bosacki, & Rose-Krasnor, 2011). Overprotective and intrusive parenting reduces opportunities for children to develop coping skills and problem solving strategies in social situations, which can be especially detrimental for withdrawn children. For example, overprotective parenting predicted inhibited children's negative adjustment outcomes (e.g., peer difficulties, internalizing problems) among kindergarteners (Hastings et al., 2011; Rubin et al., 2009). Mothers' overprotective parenting and fathers' controlling parenting predicted preschoolers' internalizing problems, including withdrawal and anxious behavior (McShane & Hastings, 2009). These findings suggest that fathers' and mothers' intrusive or controlling parenting may increase children's social withdrawal after the transition to siblinghood. In contrast, responsive and sensitive caregiving mitigates social withdrawal by empowering the development of social competence (Degnan & Fox, 2007). In addition, a growing body of research suggests that coparenting, the interplay of mothers' and fathers' childrearing, plays an important role in children's adjustment beyond individual parenting. Studies have shown links between coparenting and children's internalizing problems. For example, the lack of cooperative coparenting when children were at 2 years old was significantly associated with 3-year-old boys' behavioral inhibition (Belsky et al., 1996). Jacobvitz, Hazen, Curran, and Hitchens (2004) also found that triangulated coparenting when children were 2 years old was significantly and positively associated with internalizing symptoms 5 years later. A recent meta-analysis by Teubert and Pinquart (2010) reported significant positive associations between coparenting conflict, triangulated coparenting, and children's internalizing problems, as well as significant negative associations between coparenting cooperation and children's internalizing problems.

The quality of the mother-child attachment relationship has also been linked to children's social withdrawal in early childhood. For instance, children with an insecure-resistant attachment with their mothers in infancy were more inhibited and withdrawn in early childhood (Calkins & Fox, 1992; Stevenson-Hinde, Shouldice, & Chicot, 2011) and engaged in more social withdrawal in the preschool period (Hastings, Nuselovici, Rubin, & Cheah, 2010). Marital relationship quality and children's withdrawal are also associated. Johnston, Gonzalez and Campbell (1987) found that poor marital relationship quality predicted 4- to

12-year-old children's withdrawal and aggression 2 years later. Yet, little is known regarding the extent to which marital relationship quality is associated with the longitudinal changes in children's social withdrawal after the birth of a sibling. For the current analyses looking at predictors of children's withdrawal trajectories, we also expected to find of associations with children's shy and reactive temperament, intrusive and negative parenting behaviors, the quality of interparental relations, and children's social withdrawal.

Sibling Relationships and Early Social Withdrawal

Although few studies have examined withdrawn children's sibling relationships, shy children are more likely to have less positive social relationships with parents (Coplan, Arbeau, & Armer, 2007), teachers (Rydell, Bohlin, & Thorell, 2005), and peers (Gazelle & Ladd, 2003) so they may also have less positive sibling relationships. Shy children talk and smile much less than their peers in the preschool years (Kagan, 1997) and withdrawn children are more likely than sociable children to be disliked and bullied by peers during the formal school years (Rubin et al., 2009). Thus, withdrawn children may be more likely to form negative relationships with their siblings, although Graham and Coplan (2012) recently found no significant association between shyness and sibling relationship quality in preschool-age children. Given that the arrival of a sibling creates an unfamiliar and novel social context for firstborn children, withdrawn children may also be socially wary and avoidant of their infant sibling and build less friendly relationships with the infant (Dunn et al., 1981; Dunn & Kendrick, 1982). Alternatively, children who are withdrawn and uncomfortable in social situations outside of the family may feel safer in the family. In that case, the presence of a sibling may help these children develop better social skills that alleviate withdrawn behaviors in other social situations.

We hypothesized there would be meaningful links between changes in children's withdrawal over the year following the sibling's birth and sibling relationship quality at the end of the first year. Specifically, we hypothesized that socially withdrawn children, either those stably high over time or those increasing in social withdrawal over the transition, would have more avoidant, and possibly more conflicted, sibling interactions at 12 months compared to children low on social withdrawal.

Results

Individual Differences in Trajectories of Withdrawal

The initial modeling of latent trajectories provided support for the use of the unconditional quadratic model in the GMM analyses when uncovering individual differences in the withdrawal trajectories. We determined the four-class nonlinear quadratic model solution with the fixed effects (i.e., intercept, linear slope, and quadratic slope) and the random effects (i.e., intercept, linear slope) of growth parameters was considered the best fitting model because the four-class model had lower fit indices, AIC = 2681.71, BIC = 2760.78, LMR-LRT = .14, than both the three-class, AIC = 2701.46, BIC = 2766.79, LMR-LRT = .51, and five-class, AIC = 2675.08, BIC = 2767.91, LMR-LRT = .76, models, and higher entropy (.843) than the five class model (.797). Table 12 presents estimates and standard

errors for the fixed effects for each of the four classes and Figure 8 shows the different trajectory patterns for the four classes.

The largest class, the *low-stable* class (76.1% of the sample, $n = 175$) showed the lowest level of withdrawal at the prenatal timepoint that remained low over time. A second class was labeled the *mid-stable* class, comprising 13.5% of the sample ($n = 31$). This class showed moderate levels of withdrawal at the prenatal timepoint that remained stable over time. A third class was labeled the *mid-curvilinear* class (8.7% of the sample, $n = 20$) and showed moderate levels of withdrawal problems at the prenatal timepoint with a moderate linear increase and decelerating rate of growth over time. The last class was labeled the *high-decreasing* class and accounted for only 1.7% of the sample ($n = 4$). Children in this class showed the highest level of withdrawal at the prenatal timepoint with a significant linear decrease over time. Here, we have for the first time, some evidence of a curvilinear pattern of growth, but it does not support any of the potential patterns hypothesized in Figure 2, including the sudden persistent maladaptive pattern, the delayed impact, or the growth and maturity pattern.

As with previous scales, we examined the individual trajectories by class membership using spaghetti plots to determine whether the class membership was meaningful in relation to the CBCL borderline and clinical cut-offs (see Figure 4 in supplemental materials). The spaghetti plots clearly demonstrated that the four classes fit within these cut-off ranges, indicating that the majority of children were well within the normative range for withdrawal, and relatively few children fell in the clinical cut-off range. For instance, all children within the low-stable class were well below the normative mean, whereas most children in the high-decreasing class and the 8 children in the mid-curvilinear class fit within the borderline clinical range. Thus, the identified trajectory classes of social withdrawal fall within the normative and borderline ranges established for the CBCL; even the small class of four is a meaningful class indicative of borderline levels of withdrawal behaviors.

Predicting Withdrawal Trajectories

The combined recursive partitioning and random forest variable selection procedure identified five candidate predictors from our candidate pool: children's behavioral inhibition, children's negative emotionality, observed undermining coparenting during the prenatal home visit, observed negative marital interaction at the prenatal home visit, and spouses' reports of positive marital relationship quality. Using the low-stable class as the reference class, the full model with all possible higher-order interactions was not significantly better than the reduced model with main effects, $LR\ Chisq(df=78) = 89.432, p = .18$, so we used the reduced model for interpretation of predictors.

As seen in Table 13, the z tests show that children's behavioral inhibition is a significant predictor of differences between each of the three classes and the low-stable group (all four z s $> 1.96, p$ s $< .05$); there is a decreasing likelihood of being in the low-stable class for children higher in behavioral inhibition. Positive marital relationship quality also significantly differentiated the mid-stable class from the low-stable class, showing that the children whose parents reported positive marital relationships had a greater probability of being in the low-stable class than in the mid-stable class.

Using the mid-stable class as the reference class in an exploratory analysis, we found that children's behavioral inhibition significantly predicted class membership in the mid-curvilinear class, and that observed undermining coparenting significantly predicted the mid-stable class compared to the high-decreasing class. Specifically, children who were more behaviorally inhibited were more likely to be in the mid-curvilinear class, $b = .743$, $z = 2.071$, $p = .038$, $OR = 2.102$, than children in the mid-stable class; and children whose parents used undermining coparenting were more likely to be in the mid-stable class than in the high-decreasing class, $b = -1.143$, $z = -2.015$, $p = .044$, $OR = .319$.

Consequences of Children's Withdrawal for Sibling Relationships at One Year

We used regressions denoting the low stable class as the reference group, to test whether children's withdrawal trajectories predicted the quality of the sibling relationship (positive engagement, conflict, and avoidance) at 12 months. Results showed that parents of children in the mid-curvilinear class reported less positive sibling involvement at 12 months than the low-stable class, $b = -.250$, $SE = .126$, $p = .052$, but this difference just missed our statistical significance criterion.

Discussion of Children's Withdrawal Trajectories

This chapter explored the overall pattern of children's social withdrawal after the birth of an infant sibling, as well as heterogeneity in children's developmental trajectories of social withdrawal. In addition, we examined the risk and protective factors that predicted children's social withdrawal trajectories and the consequences of different patterns of social withdrawal for the children's developing sibling relationship.

Our initial findings revealed a nonlinear, quadratic model of change best characterized the overall pattern of social withdrawal for the sample across the transition with a gradual increase in withdrawal from prenatal to 4 months and subsequent decrease from 4 to 12 months. The analyses also revealed that there were four different trajectory patterns uncovered that were relatively consistent with the literature on social withdrawal in young children. The largest class (76% of children) displayed a low-stable pattern of withdrawal following the transition, with the remaining 24% of children showing either moderate to high levels of social withdrawal or a curvilinear pattern of gradual increase with a gradual decline over time. These findings are fairly consistent with the literature on the prevalence of social withdrawal in childhood (Rubin et al., 2009) and behavioral inhibition, and the early manifestation of withdrawal in infancy (Kagan, 1997), in which approximately 15–20% of children are inhibited and withdrawn. Most children who displayed considerable withdrawal captured in the mid-stable, mid-curvilinear, and high-decreasing classes were high on behavioral inhibition, showing a temperamental predisposition of inhibited behavior even before the birth of their infant sibling. Because temperamental characteristics of shyness, behavioral inhibition, and negative emotional responses (e.g., wariness, anxiety) when encountering novel social situations predicted social withdrawal in early childhood (Chen, Wang, & Cao, 2011; Rubin, Burgess, Kennedy, & Stewart, 2003), the transition surrounding the birth of an infant sibling may be especially stressful for children with these behavioral propensities.

Among those children (24% of the sample) who were considerably withdrawn, the mid-stable class (13.5% of children) displayed moderately high levels of withdrawal at the prenatal timepoint and remained so over time. Children in the mid-stable class were moderately high on behavioral inhibition and had mothers and fathers with less positive marital relationships prenatally, relative to the low-stable class. Their parents also engaged in more undermining coparenting during observations of triadic interaction at the prenatal home visit relative to the high-decreasing class. These findings are consistent with the literature in which a behaviorally inhibited or shy temperament contributed to sustained withdrawal over time (Kagan, 1997; Kagan & Snidman, 1991) and that negative marital relationship quality and marital conflict predicted children's internalizing problems (Davies & Cummings, 1994). In particular, interparental disagreement may have set the stage for greater emotional unavailability of parents across the transition (Campbell et al., 2007; Mathiesen & Sanson, 2000), which, in turn, created more emotional insecurity for behaviorally inhibited children (Davies & Cummings, 1994). Thus, undermining coparenting and negative marital quality coupled with children's temperamental predisposition toward behavioral inhibition may have further exacerbated children's withdrawal during the transition period.

Unlike the two stable classes noted above, both the mid-curvilinear and high-decreasing classes showed somewhat distinct nonlinear or linear patterns of longitudinal change in withdrawal. The mid-curvilinear class displayed moderately high levels of withdrawal before the birth of an infant sibling, with a significant increase after the birth and decelerating rate of growth over time. The high-decreasing class, consisting of only four children, was very high on social withdrawal, within the borderline cut-off range, and showed a linear decrease in social withdrawal over the transition. Further analyses revealed several child and parent factors that predicted these classes. For example, children in the mid-curvilinear class showed higher levels of behavioral inhibition, relative to the low-stable and mid-stable classes. In addition, the children in the mid-curvilinear class were less positive in their engagement with the younger sibling at 12 months, although this was not statistically significant ($p = .05$). Thus, stress surrounding the transition may actually exacerbate children's withdrawal after the transition (birth through 4 months) for temperamentally inhibited children. These findings illuminate the importance of temperamental predispositions that predict children's reactivity to disruptions and changes in the environment during the transition surrounding the birth of an infant sibling.

In contrast, the high-decreasing class showed the highest level of withdrawal and scored in the borderline clinical range prenatally, with a significant decrease over time. Although it was the smallest class with four participants, children in the high-decreasing class were more behaviorally inhibited before the birth and had mothers and fathers who used less undermining coparenting during observed interactions at the prenatal timepoint, relative to the mid-curvilinear class. This may reflect mothers' and fathers' willingness and commitment to coparenting, which ultimately may have protected children displaying the highest level of withdrawal (near the clinical cut-off range) before the birth of their infant sibling, but who became significantly less withdrawn over time.

The fact that marital relationship quality and observed coparenting proved to be significant family predictors in addition to children's behavioral inhibition highlights the potential buffering role of fathers for children's adjustment across the transition to siblinghood. Others have suggested that highly committed fathers to both their wives and children may be more involved in their families during the transition and play a critical role in their children's adjustment (Kreppner et al., 1982; Stewart, 1990). When fathers were engaged in supportive marital relationships and less undermining coparenting, behaviorally inhibited children appeared to benefit and become less withdrawn over time. These findings are certainly consistent with prior literature finding relations between marital relationship quality, father-child relationships, and children's emotional adjustment (Davies et al., 2009; Schacht et al., 2009).

Although small in size, the identification of the above mentioned two classes (the mid-curvilinear and high-decreasing classes) is particularly notable because a growing body of research suggests there is heterogeneity in the longitudinal patterns of withdrawal in childhood due to different underlying behavioral mechanisms and relationship processes (e.g., Booth-LaForce & Oxford, 2008; Eggum et al., 2009; Oh et al., 2008). There were also signs that children's withdrawal after the birth had repercussions for the developing sibling relationship by the end of the year. Children in the mid-curvilinear class were less positively engaged with their infant sibling at 12 months compared to children in the low-stable class. Children in the mid-curvilinear class initially showed moderate levels of withdrawal problems that were mostly between the average and the borderline-clinical cutoff at pre-birth, with a significant increase in withdrawal problems until 4 months which was followed by a gradual decline. Our result is consistent with Dunn and colleagues' findings (Dunn et al., 1981; Kendrick & Dunn, 1982) that children who were initially withdrawn at 1 month postpartum were less likely to engage in friendly interactions with their sibling at 14 months. It is also in line with the literature on withdrawn children's general relationship quality, which has shown that withdrawn children are less likely to establish positive social relationships (e.g., smile or talk less) with others in the family and school contexts (Gazelle & Ladd, 2003; Coplan et al., 2007), although they may not be prone to engage in negative social interactions (e.g., conflicts). Given that this trajectory pattern reflected an increase in problems followed by a gradual decline over the year after the birth, these children may be experiencing the arrival of a sibling as troublesome, and having difficulties adjusting to the arrival of their sibling and changes on-going in the family. Eventually, these children do appear to return to pre-birth levels of withdrawal, but they remain higher on social withdrawal even at the end of the year than children in the low-stable class. These results, combined with our earlier finding that children who were approach-avoidant in response to mother-infant interaction at 1 month had higher levels of externalizing and internalizing behavior problems at 4 months than other children (Volling et al., 2014), lends further support that children who are initially withdrawn require attention by parents after the arrival of an infant sibling (Dunn & Kendrick, 1982) and where intervention efforts may need to focus to prevent sibling relationship and behavioral difficulties later in the year. Our results also attest to the important role of fathers as coparents in helping withdrawn children adjust to the transition to siblinghood.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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

Figure 8.
Trajectory classes for withdrawal from Growth Mixture Model ($n=230$).

Table 12

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

Classes	Low-stable	Mid-stable	Mid-curvilinear	High-decreasing
Parameters	n = 175 (76.1%)	n = 31 (13.5%)	n = 20 (8.7%)	n = 4 (1.7%)
Intercept	.821 *** (.069)	1.306 *** (.235)	2.459 *** (.525)	4.711 *** (.689)
Linear slope	.088 (.047)	.166 (.280)	.763 *** (.237)	-1.232 * (.624)
Quadratic	-.009 (.007)	.016 (.040)	-.113 *** (.029)	.137 (.085)

Note. Standard errors in parentheses. The random effect (variance) of intercept est. = .209, $SE = .057$, $p < .001$; the random effect of linear slope est. < .001, $SE = .005$, $p > .05$; Quadratic random variance was constrained to be 0.

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.

Table 13

Results of Multinomial Logistic Regression Analysis Examining Class Differences for Withdrawal with the Low-Stable Class as the Reference Class

Predictor	Low-stable vs.	b	SE	z	p	OR
Children's behavioral inhibition	Mid-stable	0.46	0.23	2.01	0.044	1.59
	Mid-curvilinear	1.21	0.31	3.83	<0.001	3.34
	High-decreasing	6.56	3.24	2.02	0.043	703.78
Children's negative emotionality	Mid-stable	-0.31	0.33	-0.93	n.s.	0.74
	Mid-curvilinear	0.24	0.43	0.56	n.s.	1.27
	High-decreasing	-1.32	2.62	-0.50	n.s.	0.27
Observed undermining coparenting	Mid-stable	0.07	0.12	0.56	n.s.	1.07
	Mid-curvilinear	-0.23	0.19	-1.23	n.s.	0.80
	High-decreasing	-1.08	0.56	-1.92	n.s.	0.34
Observed negative marital interaction	Mid-stable	0.15	0.08	1.91	n.s.	1.16
	Mid-curvilinear	-0.18	0.20	-0.93	n.s.	0.83
	High-decreasing	0.46	0.42	1.09	n.s.	1.58
Positive marital relationship quality	Mid-stable	-0.49	0.24	-2.02	0.043	0.61
	Mid-curvilinear	-0.04	0.33	-0.10	n.s.	0.97
	High-decreasing	6.72	3.81	1.76	n.s.	832.47

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