Familial Risk and Sibling Mentalization: Links with Preschoolers’ Internalizing Problems

by

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A thesis submitted in conformity with the requirements for the degree of Master of Arts in School and Clinical Child Psychology Graduate Department of Applied Psychology and Human Development University of Toronto

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Abstract

The current study explored whether older sibling mentalization moderated the relationship between familial risk for internalizing symptoms and the development of future internalizing problems in the younger siblings. Data were collected on 397 older siblings at Time 1 (T1) when target children were newborn and their older siblings were on average 2.61 years old (SD=.75). Target children were on average 1.60 years old at Time 2 (T2). Internalizing problems were assessed via mother and father reports. Older sibling mentalization was observed and coded during a sibling pretend-play interaction. Results revealed a significant interaction between familial risk of internalizing problems and older siblings’ mentalizing abilities. Familial risk was related to target children’s internalizing problems in the absence of sibling mentalization. Familial risk was not associated with target children’s internalizing problems when siblings demonstrated mentalizing abilities. Findings support the need to consider sibling mentalization as a protective factor for children’s internalizing problems.
Acknowledgements

First, I would like to thank my thesis supervisor, Dr. Jennifer Jenkins for her support and supervision over the past two years. Her dedication to understanding families and child psychopathology has been an immense source of inspiration and has encouraged me to become a better researcher. I would also like to thank my lab-mates at the Developmental Psychopathology lab for their constant support and mentorship. A special thank you to Noam Binnoon-Erez (Noachelle) for being a source of encouragement and facilitating an environment where research is an enjoyable and collaborative process. I could not have done this without you!

Finally, I would like to thank my family. Mom and dad, thank you for instilling in me the value of education and encouraging me to work hard to achieve my goals and dreams in life. Jay, thank you for your patience and love and for continuously supporting me in pursuing my studies. To my sister Daniela, your love and support has made me understand the protective effect of sibling relationships first hand.
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1. Introduction
1.1 Familial Risk in Children’s Internalizing Disorders

Familiality, also known as familial aggregation, refers to the clustering of certain behaviours or mental health problems within a given family (Kendler, 1990). This clustering has been demonstrated for various disorders including depression, anxiety, schizophrenia, and bipolar disorder (Weissman et al., 2006; Goes et al., 2012; Wickham et al., 2001; Wozniak, Faraone, Martelon, McKillop, & Biederman, 2012). Although familiality demonstrates a clustering of disorders at the family-level, it does not distinguish between genetic or shared environmental causes of a disorder (Goes et al., 2012). Genetically sensitive designs enable researchers to examine how much of the familiality effect is attributable to genetic risk.

Genetic influences on mental health problems are well established in the literature (Ma et al., 2015). When examining psychopathology in childhood, much of our understanding has come from findings of twin studies. These studies have consistently shown higher rates of mental health problems in twin siblings across a broad range of disorders (McGuffin et al., 2003, Bolton et al., 2006; Bolton, Rijsdijk, O’Connor, Perrin, & Eley, 2007; Neuman et al., 2005). Family studies have shown that parental mental health problems are robust predictors of psychopathology in children across various disorders (McLaughlin et al., 2012; Kendler, Davis, & Kessler, 1997; Lieb, Isensee, Hofler, Pfister, & Wittchen, 2002). Recently, researchers have begun to examine the increased risk of psychopathology in non-twin siblings of children with mental health problems. This is an important area of study given that non-twin siblings are more representative of the general population (Ma et al., 2015). Moreover, non-twin sibling pairs share similar environmental experiences and genetic predispositions that would increase the risk of developing psychopathology compared to siblings of typically developing children (Ma et al., 2015). A recent meta-analysis conducted by Ma and colleagues (2015) synthesized results across numerous studies, which indicate that non-twin siblings of children with psychopathology are two to four times more likely to have a psychiatric diagnosis compared to healthy children depending on the type of mental health problem.

Several studies that are of high methodological quality (i.e. appropriate sample sizes, presence of control groups, and robust measures of psychopathology) provide evidence that siblings of
children with internalizing problems have significantly higher rates of such disorders compared to control children (Ma et al., 2015). With respect to mood disorders, rates range between 18.6-24.7% for affective disorders in target siblings (Geller et al., 2006; Ryan, Williamson, Iyengar, & Orvaschel, 1992). Both studies found significantly higher rates of Bipolar and Major Depressive Disorder in target siblings compared to control siblings. In addition to mood disorders, a few studies have examined the prevalence of anxiety disorders in siblings of children with anxiety disorders. These studies report a prevalence rate of 14.6% for early onset Obsessive-Compulsive Disorder and a prevalence rate of 21.7% for any other type of anxiety disorder (do Rosario-Campos et al., 2005; Last, Hersen, Kazdin, Orvaschel, & Perrin, 1991). Therefore, the existing literature base provides evidence that siblings of children with internalizing disorders have significantly higher rates of such disorders compared to control siblings and the general population (Ma et al., 2015). Importantly, there is consistent evidence that younger aged siblings are more likely to have a diagnosis compared to older siblings (Ma et al., 2015). Authors suggest that older siblings may expose their younger siblings to maladaptive cognitions and behaviours, which can increase the risk for psychopathology.

The higher prevalence rates of internalizing symptoms in non-twin siblings of children with such problems are a result of both genetic and shared environmental factors (Ma et al., 2015). Throughout this paper, we use the term *familial* to signify this risk. Because we did not have a genetically sensitive design, we are not able to identify possible mechanisms in this familiality.

**1.2. Stability of Internalizing Problems in Early Childhood**

Investigating siblings of children with internalizing problems is an important area of research given that there is strong stability of internalizing symptoms across early childhood. For example, Cote et al., (2009) examined internalizing symptoms in 18-month-old children and tracked symptoms yearly until the age of 5. Researchers found that 55.4% of children followed a moderate-rising trajectory of symptoms as they got older, 29.9% of children remained at a low level, and 14.7% of children exhibited a sharp increase of symptoms with development. There were no significant sex differences in the trajectories. Importantly, father and mother reporting of symptoms led to identification of similar developmental trajectories. Similarly, Sterba, Prinstein, and Cox (2007) found that internalizing symptoms were stable from 2 to 11 years old at both
high and low extremes of the observed range of behaviours. Similar to the previous study, the internalizing trajectories were similar across gender. Overall, findings from the above studies demonstrate that young children at risk for continued internalizing problems can be identified during the preschool years and that trajectories are stable across childhood. Recurring internalizing problems during childhood increases the likelihood of anxiety and depressive symptoms in early adolescence and into adulthood (Colman, Ploubidis, Wadsworth, Jones, & Croudace, 2007).

1.3 Sibling Relationships as Protective for Child Internalizing Problems

Sibling warmth refers to relationships that involve intimacy, affection, closeness, and support (Sanders, 2004). Various studies report associations between warm sibling relationships and lower levels of internalizing problems (East & Rook, 1992; Kim, McHale, Crouter, & Osgood, 2007; Buist, Dekovic, & Gerris, 2011) including a meta-analysis (Buist, Dekovic, & Prinzie, 2013).

Warm and positive sibling relationships have also been studied as protective factors for children at risk for developing internalizing problems (Jenkins, 1992; Gass, Jenkins, & Dunn, 2007). Protective factors have been operationalized as factors that promote beneficial outcomes, in the presence of significant risk (Rutter, 2000; Luthar, 1991; Jenkins, 2008). In a cross-sectional study, Jenkins (1992), found that children living in homes with high levels of marital conflict exhibited fewer emotional and behavioural problems when they had a warm relationship with their sibling. Similarly, using a longitudinal design, Gass et al., (2007) found that young children experiencing stressful life events (e.g. illnesses, deaths, school difficulties) were less likely to experience internalizing symptomatology if they had an affectionate sibling relationship. Authors speculated about a potential mechanism underlying this protective effect; siblings who are available, warm, and responsive may provide comfort and security in times of distress (Gass et al., 2007). Subsequently, children have a greater ability to cope and respond to stress, thereby decreasing the likelihood of developing internalizing problems (Gass, Jenkins, & Dunn, 2007).
1.4 Sibling Mentalizing Abilities

Sibling mentalization has been previously examined as a protective factor for children at risk for poor socio-cognitive and language development (Prime, Pauker, Plamondon, Perlman & Jenkins, 2014a; Prime, Plamondon, Pauker, Perlman, & Jenkins, 2016), but not psychopathology.

Mentalizing has been broadly conceptualized as the capacity to understand others and oneself in terms of mental states (i.e. emotions, desires, and beliefs) as well as the ability to reason about behaviour in terms of mental states (Fonagy, Target, Steele, & Steele, 1998). Various behaviours have been used to index mentalization children. For instance, cognitive sensitivity refers to the degree to which children accurately perceive and respond to others’ inferred cognitions (i.e., Prime, Perlman, Tackett, & Jenkins, 2014b). Another related construct is perspective taking, which refers to a child’s ability to interpret others’ feelings and behaviour, understand the reasons for their feelings and behaviour, and appropriately respond (Stewart & Marvin, 1984). Other researchers have measured children’s internal state talk (i.e. emotions, desires, beliefs) and reasoning, which indexes their ability to think about ones own and other’s thoughts and behaviours (Rosso, Viterbori, & Scopesi, 2015).

There are several reasons to hypothesize sibling mentalization as a protective factor for children at risk for psychopathology. First, sibling mentalization may be a protective factor for child internalizing problems through scaffolding an understanding of children’s own and other’s mental states (Lewis, Freeman, Kyriakidou, Maridaki-Kassotaki, & Berridge, 1996). For instance, older siblings who label and talk about emotions may promote emotion regulation by supporting younger siblings to develop links between cues, situations, and emotional experiences (Schultz, Izard, Ackerman, & Youngstrom, 2001; Fonagy et al., 1998).

Second, sibling mentalization is associated with greater warmth and support in sibling relationships, which, as discussed, have been shown to protect against risk for psychopathology (Gass, Jenkins, & Dunn, 2007). For instance, Stewart and Marvin (1984) found that older siblings who made non-egocentric inferences about another’s point of view during a standardized task were more likely to engage in a caregiving activity with their younger sibling in a modified strange situation task. Similarly, Howe and Rinaldi (2004) reported that older children who were
better able to recognize others’ points of view in affective and cognitive tasks were more emotionally sensitive during videotaped sibling interactions. Relatedly, researchers have found that preschool children who directed more internal state language toward their younger sibling and could identify another’s point of view on a cognitive task had more affective and friendly interactions with their younger siblings (Howe & Ross, 1990; Howe, 1991).

Finally, sibling mentalization may foster secure attachments, which have been shown to protect children against undesirable mental health outcomes (DeKlyen & Greenberg, 2008). Mothers who respond to their children as individuals with internal thoughts and feelings and are able to see experiences through the child’s eyes are more likely to develop secure attachments with their children (Koren-Karie, Oppenheim, Dolev, Sher, & Etzion-Carasso, 2002). Perhaps older sibling mentalization can nurture secure attachments and protect children from developing internalizing problems. In the current study, mentalization was operationalized as internal state talk and reasoning during a sibling pretend-play interaction.

1.5 Current Study

Although younger siblings of children with internalizing problems are at an increased risk for developing such disorders themselves, not all children will exhibit psychopathology. This suggests that the relationship between high familial risk and later internalizing problems is dependent on other moderating factors. Having older siblings who exhibit internalizing problems can be considered a “risk factor” that increases the likelihood of younger children developing internalizing problems, while factors that weaken the relationship between familial risk and internalizing problems can be considered “protective factors” (Rutter, 2000; Luthar, 1991; Jenkins, 2008). This is examined by testing the statistical interaction between the risk and protective factor.

The aim of the present study was to explore whether older sibling mentalization moderated the relationship between high familial risk for internalizing problems and the development of future internalizing problems in target children.

In the current study, it was hypothesized that there would be a significant interaction between familial risk and older sibling mentalizing abilities when predicting levels of internalizing
problems in younger children. More specifically, we hypothesized that in the absence of older sibling mentalizing, familial risk will be related to elevated internalizing problems. It was further hypothesized that in the presence of older sibling mentalization, familial risk will not be related to the amount of internalizing problems.

In order to draw conclusions about the specific processes occurring between siblings and their relationship to internalizing problems, various measures associated with the outcome variable were included in the analysis as covariates. First, we controlled for socioeconomic status and maternal behaviour (i.e. sensitive responding), both of which have been linked to internalizing symptoms in childhood (Slopen, Fitzmaurice, Williams, & Gilman, 2010; Bor et al., 1997; Kok et al., 2013; Moss et al., 2011). Moreover, we controlled for single parent status and whether the mother was an adolescent at the time of the target child’s birth, which are two factors that have also been shown in the literature to relate to internalizing problems (Ram & Hou 2003; Fergusson & Woodward, 1999).

The present study adds to the current literature in two ways. First, studying non-twin siblings of children with psychopathology is relatively recent and therefore, protective factors for psychopathology specific to this at risk sample of children have received little empirical attention. Second, older sibling mentalization has not been previously examined as a protective factor for child mental health problems.

2. Methodology
2.1 Sample

The current study was embedded within a larger longitudinal birth-cohort study, the goals of which were to examine biological and environmental influences on children’s socio-emotional development through the investigation of within-family differences. Participants come from the intensive sample of the Kids, Families, and Places (KFP) study. Women giving birth in Toronto and Hamilton between April 2006 and February 2008 were considered for participation in the longitudinal study. Recruitment occurred through a provincial healthcare program (Healthy Babies Healthy Children), which contacted the parents of all newborn babies within days of the
newborn’s birth. To be included in the KFP study, families must have had a newborn child (referred to as ‘target child’) weighing more than 1500 grams, with at least one older child within four years of the newborn (referred to as ‘next in age older sibling’). Additional criteria included English-speaking mothers who agreed to be videotaped in the home. 501 families were enlisted into the KFP study. At Time 1, target children were ~2 months and these families were followed up at 18 months. Observational data and direct testing were carried out on the target child and the next in age older sibling at each wave of data collection. The KFP sample was similar to the general population of Toronto and Hamilton (2006 Census data) in terms of number of persons in the household and personal income, but had fewer non-intact families, fewer immigrants, and a higher proportion of educated mothers (Meunier, Boyle, O’Connor, & Jenkins, 2013). The University of Toronto Research Ethics Board approved all procedures for this study, including informed consent.

2.2 Participants

The current study is based on data from families who participated at both Time 1 (T1) and Time 2 (T2) waves of data collection (N=397). Of the participating families, 74.3% had two children living in the home and the remaining families had three or more children in the home. The mean age of target children at T1 was 2.00 months (SD=1.06) and 52.6% of the sample was male. The mean age of their next in age older siblings was 2.61 years (SD=.75) and 51.6% were males. On average, target children were 1.6 years older at T2. The sample was diverse; 60.7% of mothers were Caucasian, 13.9% were South Asian, 6.3% were Black, 12.6% were East/South East Asian, and 6.5% were classified as “other”. Just over half the mothers (57.7%) were born in Canada. The average household income level for the sample at T2 ranged from $75,000- $84,999.

2.3 Measures

2.3.1 Target Child Internalizing Problems (T2)

Each parent separately reported target children’s internalizing problems using scales from the Ontario Child Health Study (Boyle et al., 1993). Internalizing problems were assessed by having parents read and rate eight statements on a never/not true (1) to often/very true (3) scale.
Examples of items include: seems to be unhappy, sad, or depressed; is too fearful or anxious; is nervous, high strung, or tense; has trouble enjoying him/herself. A mean of the items was calculated, with higher values representing more internalizing problems. Internal consistency, assessed by Cronbach’s alpha, was adequate for mothers ($\alpha = .66$) and partners ($\alpha = .73$). Mother and partner reports were correlated ($r = .52, p<.001$) and therefore a mean was computed to create a composite for internalizing problems.

### 2.3.2 Familial Risk (T1)

Each parent separately reported internalizing problems of the target child’s older siblings (up to a maximum of 3) as described above. Familial risk was then computed by taking the average of all older siblings’ internalizing problems at T1.

### 2.3.3 Internal State Talk and Reasoning (T2)

Sibling pairs were filmed while engaging in a pretend play task. During the home visit, interviewers provided the target child and his/her next in age older sibling with a toy set and asked the older child to pretend play with their younger sibling for 10 minutes.

Videotapes of sibling interactions were coded and older sibling mentalization was operationalized as the presence of internal state talk and verbal reasoning displayed by the older sibling during the pretend play task. Internal state talk was characterized as explicit expressions of desires, beliefs, and emotions. Verbal reasoning was operationalized as any justification or explanation of behaviour expressed by the older sibling to the younger sibling during the interaction. Behaviours were coded in 20-second snapshots and the observation period lasted for 10 minutes. Coders indicated the presence (1) or absence (0) of the older sibling’s internal state talk and reasoning toward the younger sibling for each 20-second snapshot. A final mentalization score was calculated by summing all instances of internal state talk and verbal reasoning divided by the number of snapshots. The internal consistency of the construct was good ($\alpha = .78$). Because the distribution of the variables making up the construct was zero inflated, the final mentalization score was dichotomized. Older siblings who had a score of 0 kept that score. Siblings with any value greater than 0 were assigned a value of 1 and were considered to be more skilled with respect to mentalizing abilities. Analyses were carried out with and without this
transformation and all substantive results remained the same. Due to the binary nature of all the variables included in the construct, a polychoric factor analysis was conducted in Stata (SE 12.0 version) to measure the construct’s internal consistency. Initial polychoric factor analyses showed that the variable beliefs had a low factor loading (0.20) on the construct. The low factor loading is not surprising given that the use of belief talk is less common in this age group than desire or emotion talk (Jenkins et al., 2003). As a result, beliefs were removed from the construct and additional factor analyses were conducted. Eigenvalues demonstrated that the first factor explained 42% of the variance and variables that make-up the construct (desire, emotion, and reasoning) showed factor loadings ranging between 0.43-0.67. Coders included a mix of undergraduate and graduate students who were trained by an expert coder and blind to the hypotheses of the study.

2.3.4 Covariates (T2)

Various covariates were included in the analysis due to their association with the outcome variable. Mothers completed a questionnaire during the home visit indicating target child gender (0=female, 1=male), target child age (years and months), number of children aged 0<18 in the household, single parent status, and teenage status at first pregnancy (0=No; 1=Yes). Dyad age gap was calculated by subtracting the age of the next in age older sibling from the age of the target child. Mothers also reported annual household income and family assets. Household income was coded on a 16-point scale ranging from no income (1) to $105,000 or more (16), in 5k (bottom end of scale) and 10k ranges and afterwards standardized. Assets were measured by asking mothers for information regarding ownership of a house, car, and the number of rooms in the household. Values were again standardized and summed. An SES composite was created because assets and income were correlated (r=.69). The composite was created by computing a mean of assets and income with higher scores indicating higher income/assets. Maternal sensitivity was assessed through three 5-minute observational mother-target child interactions (free-play, cooperative peg-board task, and wordless picture book task) during the home visit. Interactions were coded for maternal positive control, maternal sensitivity, and mother-child mutuality using the Coding of Attachment-Related Parenting (CARP; Matias, Scott, & O’Connor, 2006) and the Parent-Child Interaction System (PARCHISY; Deater-Deckard, Pylas, & Petrill, 1997). A composite was created by taking the mean of the three scales across the three
tasks (internal consistency $\alpha = .85$; interrater reliability $\alpha = .94$). Further details on this construct can be found in Meunier et al., (2013).

2.4 Data Analysis

2.4.1 Procedure

A series of multiple regression analyses were conducted using Mplus 7.2 first to determine the covariates to be included in the main analysis (based on significance at the $p=.05$ level) and then to examine the relationship between familial risk and older sibling internal state talk and reasoning in the prediction of target child’s internalizing problems at T2. Non-significant covariates (target child gender, target child age, number of children in household, single parent status, teenage pregnancy, dyad age gap, and maternal sensitivity) were dropped from the subsequent analysis. In the final analysis, one significant covariate (SES at T2), hypothesized predictor variables (familial risk at T1 and internal state talk and reasoning at T2), and the interaction term (familial risk*internal state talk and reasoning) were included in the model. Before beginning the analysis, continuous variables in the model were centered to reduce multicollinearity between predictors and the interaction term and allow for the testing of simple slopes (Holmbeck, 2002). The interaction term was computed using the centered variables.

2.4.2 Missing Data

SES, target child’s internalizing problems, and older siblings average internalizing problems had minimal missing data (<5%). Missing data for older sibling internal state talk and reasoning was also low (12%). To handle missing data, Full Information Maximum Likelihood Estimation (FIML) was used. FIML estimates model parameters and standard errors using all available information and is superior in terms of bias and efficiency compared to other methods, such as multiple imputation and listwise deletion (Enders & Bandalos, 2001).

3. Results

Table 1 provides descriptive statistics for the internalizing problems of the target child (T2), SES (T2), familial risk (T1), and older sibling internal state talk and reasoning (T2). The bivariate
correlations between these variables are also provided. Associations were in the small to medium range and in the expected directions. The bivariate correlations between main study variables indicated that target child’s internalizing problems at T2 were higher when their older sibling(s) had more internalizing problems and were significantly negatively correlated with older sibling internal state talk and reasoning ($r=-.12$, $p < .05$).

Table 1: Bivariate correlations and number of participants for study variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>$n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Target Child internalizing T2</td>
<td>-.29**</td>
<td>.30**</td>
<td>-.12*</td>
<td>388</td>
</tr>
<tr>
<td>2. SES T2</td>
<td>.20**</td>
<td>-.02</td>
<td></td>
<td>382</td>
</tr>
<tr>
<td>3. Familial Risk T1</td>
<td></td>
<td>-.06</td>
<td></td>
<td>384</td>
</tr>
<tr>
<td>4. Sib internal state talk and reasoning T2</td>
<td></td>
<td></td>
<td></td>
<td>350</td>
</tr>
</tbody>
</table>

$Note$: $n$ = Number of participants with valid scores; $SD$ = Standard deviation; $T1$ = Time 1; $T2$ = Time 2; ** $p < .01$; * $p < .05$; † $p < .10$.

Table 2 presents the results of the regression analysis in the prediction of target child internalizing problems at T2. The overall regression, including SES, main study predictors, and the interaction term, was statistically significant, $R^2 = .191$, $p < .001$, with 19% of the variance being accounted for by the main study predictors. When examining independent predictors, family average of older siblings’ internalizing problems (i.e. familial risk) and older sibling internal state talk and reasoning were significantly related to target children’s internalizing problems. The interaction was also significant, with 3.1% of the variance attributable to the interaction between familial risk and older sibling internal state talk and reasoning. Being from a lower SES household was significantly associated with higher internalizing problems at T2. As noted previously, when the multiple regression analysis was conducted using the original sibling internal state talk and reasoning variable (non-dichotomized), the pattern of results did not change.
Table 2: Summary of Regression Analysis.

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>S.E.</th>
<th>β</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Covariates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>-0.224</td>
<td>0.045</td>
<td>-0.269</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Predictors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familial Risk</td>
<td>0.393</td>
<td>0.082</td>
<td>0.452</td>
<td>0.000</td>
</tr>
<tr>
<td>Old sib internal state talk and reasoning</td>
<td>-0.157</td>
<td>0.073</td>
<td>-0.111</td>
<td>0.027</td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familial risk * Old sib internal state talk and reasoning</td>
<td>-0.319</td>
<td>0.097</td>
<td>-0.281</td>
<td>0.001</td>
</tr>
</tbody>
</table>

To probe the nature of the significant interaction, the association between familial risk (one standard deviation above and below the mean) and target children’s later internalizing problems was plotted as a function of older sibling internal state talk and reasoning (Holmbeck, 2002; Figure 1). Testing of simple slopes demonstrated that the association between familial risk and internalizing problems was significant when older siblings did not exhibit internal state talk and reasoning, $\beta = 0.452, p < .001$, but not when older sibling’s displayed such abilities, $\beta = 0.086, ns$. Hence, high familial risk was associated with more internalizing problems in the absence of an older sibling who displayed internal state talk and reasoning skills.
**Figure 1.** Regression lines for relations between familial risk and children’s internalizing problems as moderated by older sibling internal state talk and reasoning (one standard deviation above and below the mean). Slope of no internal state talk and reasoning line is significant, $\beta = 0.452$, $p < .001$, presence of internal state talk and reasoning line is not $\beta = 0.086$, n.s.

4. **Discussion**

The goal of the present study was to examine the protective effect of sibling mentalization (as indexed by internal state talk and reasoning) on child internalizing problems for children at increased risk for developing such problems. In accordance with the initial hypotheses, the interaction between familial risk and sibling mentalization was statistically significant. More specifically, target children at high familial risk for internalizing problems exhibited more internalizing problems than those children at low familial risk, but only if their older siblings did not display mentalizing abilities, supporting our initial hypotheses. Hence, older sibling mentalization was solely a protective factor for target children at high familial risk. These findings support the resilience literature whereby a protective factor does not confer advantage to all children but rather, only confers protection to children who need it the most, in this case being target children at high familial risk (Jenkins, 2008).
Results also revealed that familial risk (i.e. older siblings’ internalizing problems) at T1 was significantly associated with higher target child internalizing symptoms at T2. This finding is in line with the work of Ma and colleagues (2015), demonstrating that siblings of children with internalizing problems are more likely to develop internalizing problems themselves, compared to siblings of healthy children. Another finding revealed that target children from lower SES households were more likely to develop internalizing problems. This finding is in line with a large body of research showing that internalizing problems tend to aggregate in economically disadvantaged families (Slopen et al., 2010; Bor et al., 1997; McLeod & Shanahan, 1996).

Finally, it is important to note that there was no significant correlation between familial risk and sibling internal state talk and reasoning, demonstrating that these processes are different and can be separated.

Findings of the protective effect of sibling mentalization can be considered through a socio-cognitive framework. It has been suggested that children construct social understanding through interactions with their social partners (Carpendale & Lewis, 2004). Older siblings who direct internal state language toward their younger sibling and model perspective-taking may further support young children in thinking and discussing their own and others’ thoughts, feelings, and behaviours. As a result, children acquire skills that facilitate the integration of emotional and psychological experience, which may prevent internalizing symptoms in the face of risk. Internal state talk by an older sibling may also scaffold emotion knowledge in the younger sibling, which has been shown to positively relate to social competence and negatively relate to internalizing behaviour (Schultz et al., 2001). Subsequently, children become more proficient at evaluating and processing emotional stimuli that facilitates their own emotion regulation, which can be protective against the development of internalizing symptomology (Schultz et al., 2001).

An alternative explanation of the results found in this study may be that mentalization promotes secure attachment between siblings and fosters warm and affectionate relationships. For instance, similar to parents, a sibling who is able to perceive events, behaviours, and emotional states through the child’s eyes can create a secure attachment that provides a child with a sense of security and a positive view of themselves and the world (Bowlby, 1973). Such positive attachment experiences provide a context in which young children learn healthy strategies to regulate their emotional states (DeKlyen & Greenberg, 2008). As a result, children who exhibit
secure base behaviour with their sibling may be less likely to develop feelings of fear, hopelessness, and inadequacy associated with anxiety and depression in the face of risk (Buist et al., 2013). Older siblings who exhibit mentalizing skills may be more emotionally sensitive (Howe and Rinaldi, 2004). As a result, young children feel a sense of comfort and security, which increases their ability to cope in situations of distress.

4.1 Limitations and Future Research

The current findings should be considered in light of limitations. First, to reduce burden on families, we only collected observational data on the next in age older sibling. In the future, it would be useful to examine internal mental state talk and reasoning of all siblings in the home. Doing so, would lead to a better understanding of the differences in mental state talk and reasoning across different sibling dyads and its relation to mental health outcomes. Second, internalizing problems were only observed at one time point (T2). Due to the fact that target children were approximately 2 months old at T1, a baseline measure of internalizing problems was not conducted. Future work should longitudinally examine internalizing problems to enable statements of directionality between predictor and outcome variables.

These limitations should be viewed in the context of the strengths of this study. To our knowledge, this is the first study to examine the protective effects of sibling internal state talk and reasoning on internalizing problems. The results of this study add to the current literature of the protective effects of sibling relationships and offers new avenues for prevention of internalizing problems. Moreover, utilizing different respondents (i.e. mother and partner) for the predictor and outcome variables, suggests that the results are a valid reflection of the relationship between familial risk, older sibling internal state talk and reasoning, and child outcome rather than a product of reporter bias. If further studies are carried out and the findings from the current study are replicated, the remedial implications for these results are considerable. For children at heightened risk for developing internalizing problems, interventions that support the development and strengthening of sibling mental state talk and reasoning may provide children with protection from developing internalizing problems.
Protective factors weaken the relationship between early risk and negative child outcomes (Masten, Best, & Garmezy, 1990). In the present study, it was found that children who are at heightened risk for developing internalizing problems show resilience in the presence of compensatory experiences (mentalizing older siblings). It is important to understand how risk and protective factors interact in children’s lives as a means to prevent poor mental health outcomes.

Investigating protective factors for siblings of children with internalizing problems is an important area of research given that there is a strong stability of internalizing symptoms across early childhood into adolescence and adulthood (Bayer et al., 2010). Internalizing problems also have downstream consequences on peer relations, academic achievement, employment, and early mortality (Reijntes, Kamphuis, Prinzie, & Telch, 2010; Esch et al., 2014; Butterworth, Leach, Pirkis, & Kelaher, 2012; Jokela, Ferrie, & Kivimaki, 2009). Therefore, examining factors that may promote resiliency in siblings of children with internalizing disorders can have important prevention and intervention implications.
References


