

Siblings' Interpretations of Conflict:
The Link Between Relationship Quality and Conflict Strategies?

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ABSTRACT

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Research demonstrates that children who have a positive sibling relationship quality also employ more constructive conflict strategies, however, the mechanism underlying this association is unclear. Peer research suggests that children's interpretation of disputes is associated with the way conflict is resolved, however, the interpretive processes underlying sibling disputes are understudied. This study adapted methodological approaches frequently used in peer research (i.e., hypothetical provocation scenarios in which the perpetrator's intent is ambiguous) for use with siblings. We expected that children's attribution of intent would explain the link between sibling relationship quality and conflict strategies employed during sibling disputes. A total of 122 six-to eight-year-old children (62 younger and 60 older siblings; 49 girls) were presented with ambiguous provocation scenarios and asked to attribute their siblings' intent. Responses were coded as accidental, instrumental, hostile, or Machiavellian. Questionnaires assessed conflict strategies, types of aggression, and sibling relationship quality. Results revealed that children attributed more hostile intent to older siblings and instrumental intent to younger siblings. Moreover, when children had a more negative relationship quality with their siblings they also reported using fewer constructive strategies and engaged in more aggressive behaviors. In addition, sibling relationship quality was negatively associated with hostile intent and positively linked to instrumental intent. Furthermore, children who attributed more instrumental intent also used more constructive conflict strategies. Finally, attributions of intent did not explain the link between relationship quality and conflict strategies employed. This study suggests that methodologies commonly used with peers can be adapted to further our understanding of conflict processes among siblings.

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Table of Contents

List of Figures.....	vii
List of Tables.....	viii
Introduction	1
Past Research on Sibling Conflict and Relationships.....	2
Theory & Research on Social-Information Processing in Peer Relationships.....	4
Sibling Birth Order.....	9
The Current Study: Adapting Peer Research for Siblings.....	10
Method.....	12
Participants and Recruitment.....	12
Procedure.....	13
Measures and Coding.....	13
Results.....	15
Plans of Analysis.....	15
How are Birth Order and Gender Related to Attribution of Intent, Relationship Quality, and Conflict Strategies?.....	16
How are Children’s Report of Conflict Strategies Related to Parent’s Reports of Types of Aggression Employed During Conflict?.....	16
How are Children’s Report of Relationship Quality Related to Conflict Strategies Used and Types of Aggression Employed During Conflict? ...	17
How are Children’s Reports of Relationship Quality Associated with Their Attribution of Intent in Response to Ambiguous Provocation?	17
How are Children’s Attribution of Intent Associated to Children’s Conflict Strategies and Types of Conflict?	17
Do Attributions of Intent Mediate the Relationship between Sibling’s Relationship Quality and Conflict Strategies Employed?	18
Discussion.....	21
Birth Order, Attributions of Intent, and Conflict Strategies.....	21
Relationship Quality and Conflict Strategies.....	22

Relationship Quality and Attribution of Intent.....	23
Attribution of Intent and Conflict Strategies.....	24
Types of Aggression and Conflict Strategies.....	25
Mediation Model.....	26
Limitations.....	26
Implications and Conclusions.....	27
References.....	32
Appendices.....	37
Appendix A: Scenarios and Questions.....	37
Appendix B: Coding Scheme.....	40
Appendix C: Participant Conflict Strategies Questionnaire.....	43
Appendix D: Visual Aid Provided to Children to Answer Conflict Strategy Questions.....	44
Appendix E: Participant Relationship Quality Questionnaire.....	45
Appendix F: Visual Aid for Children to Answer Relationship Quality Questionnaire.....	46
Appendix G: Parent Conflict Strategies Questionnaire.....	47
Appendix H: Demographic Questionnaire.....	48

List of Figures

Figure		
1	Mediation Model.....	29
2	Alternative Mediation Model.....	30
3	Relationship Quality Independently Linked to Conflict Strategies and Attribution of Intent.....	31

List of Tables

Table

1	Partial Correlations between Reports of Sibling Conflict Strategies, Proactive and Reactive Aggression, and Sibling Relationship Quality...	19
2	Correlations between Relationship Quality, Conflict Strategies, Types of Aggression, and Attributions of Intent.....	20

Siblings' Interpretations of Conflict: The Link Between Relationship Quality and Conflict Strategies

In any close relationship, including sibling relationships, conflict is inevitable. Research has suggested that conflict can provide opportunities for children to further their social skills and emotion regulation (Volling, 2003). However, attention has also been given to the repercussions of hostile disputes and how they can impact children detrimentally. In particular, destructive and aggressive behaviors are commonly observed within sibling dyads during conflict (Recchia & Howe, 2009a; Recchia, Wainryb, & Pasupathi, 2013). This can be problematic given that sibling relationships have an influential effect on children's development (Furman & Buhrmester, 1985a; Howe, Ross, & Recchia, 2011), and participating in destructive and malicious behaviours during sibling disputes have been linked to poor peer relationships, behaviour problems, difficulties in school, and delinquent conduct (Bank, Patterson, & Reid, 1996). In addition, aggressive sibling conflicts during the earlier years can persist into adulthood; this suggests that the quality of sibling relationships is constructed during early childhood (Loeber & Hay, 1997). Therefore, it is important to develop a better understanding of the factors that contribute to constructive methods of resolving sibling fights when children are young. This thesis aimed to contribute to the literature by addressing how siblings' interpretations of their disputes may play into this process. By interpretation, we are referring to how children mentally process information in a given situation; specifically how they encode this information and the meaning they attribute to these social cues. More specifically, the purpose of this study was to examine whether children's interpretations of ambiguous conflict scenarios mediate the link between siblings' relationship quality and the conflict strategies that they use during disputes.

In the subsequent sections of the introduction, I will discuss the unique features of sibling relationships and the range of strategies that siblings employ during conflict. Moreover, previous findings in sibling research that bear on interpretive processes will be addressed, along with limitations of the methodological approaches used in past research. Specifically, I will elaborate on how alternative methodologies can disentangle the distinctions between interpretative processes and the realities of sibling conflicts. Subsequently, I will provide a brief review of the social-information processing model that provides a conceptual basis for the current project, and will discuss methodological procedures used to assess peer conflict and aggression and how they

can be applied to understanding sibling conflict. Finally, I will describe the current study as well as the hypotheses based on the literature.

Past Research on Sibling Conflict and Relationships

Sibling relationships range widely in quality; relations between siblings vary from being close or distant, cooperative or competitive, and harmonious or conflicted (Furman & Buhrmester, 1985a). This mixture of characteristics is posited to lead to unique learning experiences in sibling relationships (Furman & Buhrmester, 1985b). Sibling disputes can be settled in a malicious and hostile manner or, alternatively be characterized by less aggressive strategies such as discussions of the matter at hand. The former description of resolution is commonly known as destructive conflict. Destructive conflicts are characterized by high negative affect, often spread beyond the initial issue to other issues, and may escalate into intrusive and persistent coercion (Vandell & Bailey, 1992). These malicious responses to conflicts often involve lashing out in anger or retaliating in response to siblings' actions (Recchia et al., 2013). Destructive forms of conflicts usually end with one or both parties being dissatisfied with the end results. Constructive conflicts, in contrast, focus on the issue at hand and rely on less aggressive behaviours (Vandell & Bailey, 1992; Volling, 2003). They conclude with a mutual agreement and a beneficial shared understanding. During constructive conflicts, the intensity level is minimized in comparison to destructive disputes and conflicts are more likely to be resolved by means of negotiation in a way that is acceptable to both parties (Vandell & Bailey, 1992).

It has been well noted that some siblings resolve conflicts destructively and participate in maladaptive behaviors, however, there is a great deal of variability in how siblings get along. These individual differences in sibling relationships have been associated with the type of conflict strategies that children employ. Rinaldi and Howe (2003) found that siblings engaged in frequent destructive conflict behaviours when their dyadic relationship was negative, whereas they employed more construct conflict behaviors when their relationship was more positive. Similarly, Recchia and Howe (2009a) revealed that sibling dyads that had a more negative quality relationship employed more destructive strategies in conflict. To date, however, research has not examined whether children's interpretations of conflict play a role in explaining this link between relationship quality and conflict strategies. Arguably, interpretive processes may be framed by the child's past experiences and interactions in a particular relationship, and in turn,

may guide children's responses to conflict. Therefore, examining children's interpretations may contribute to our understanding of sibling conflict resolution. Findings from research with peers that bear on how this construct is relevant to understanding children's conflict processes will be elaborated in the subsequent section.

Some previous research with siblings has indirectly addressed how interpretive processes frame children's experiences of conflict. In particular, in a study conducted by McGuire, Manke, Eftekhari, and Dunn (2000), the authors aimed to document children's views of sibling conflict, including the initiation of conflict and resolution strategies used during disputes. A semi-structured interview was completed with children between the ages of 8- to -11-year-olds. The children answered questions such as: (a) *Can you tell me about a fight you recently had?* and (b) *Who usually starts the fight?* With the use of this method, the results indicated that children believed that the other sibling was most likely to start the fight; children often blamed their sibling for the dispute and justified their own conflict behaviors. This suggests that children are less likely to believe that their actions contributed to their disputes. Although these findings are relevant to understanding children's interpretations of conflict in that they ask children to discuss their views about disputes, there were some limitations of their methodological approach. In particular, McGuire et al. (2000) asked each sibling to discuss a conflict that was salient to them, which most likely led each child to focus on different events. This approach skews the results since each child in the dyadic pair may have opted to elaborate on disputes that differed from each other, specifically, in which they are in the role of victim while their sibling fulfills the antagonist role. Therefore, it is difficult to determine the extent to which children's interpretations explain these findings; children's description of the conflict may be inconsistent between the dyadic pair simply due to the selection of different conflicts, rather than interpretive processes.

For this reason, using identical real-life conflicts is a preferable approach, but also has its limitations. Research on sibling conflict has repeatedly used methodological techniques in which two children discuss the same conflict (see Recchia & Howe, 2009b; Wilson, Smith, Ross, & Ross, 2004). When two siblings are asked to describe the same conflict, their recall is incongruent, in that children's contrasting narratives often focus on their innocence and the harm the perpetrator caused. This provides stronger evidence that interpretive processes *do* play a role in siblings' recall. For example, Wilson et al. (2004) talked to children about a specific conflict

that was nominated by their parents to be the most salient dispute in the previous week. Results revealed that both siblings were more likely to justify the harm they caused and blame their sibling for the dispute. In addition, almost all children viewed themselves as less blameworthy than their sibling. Moreover, children often conveyed that their own actions were less harmful than the actions of their siblings.

Although Wilson et al. (2004) improved upon the McGuire et al. (2000) study by using identical conflicts, this methodological approach still fails to recognize how children's relationship quality is associated with differences in the realities of children's conflicts. Thus, the method limits our ability to examine the role of interpretation in explaining individual differences between dyads. More specifically, inasmuch as our goal is to determine whether interpretation explains links between children's accounts of sibling conflict and their relationship quality, these past studies do not make clear whether children with more positive relationships actually have fewer hostile conflicts or, alternatively, whether they *interpret* their conflicts as less hostile.

In sum, in an effort to establish firmly the extent to which interpretive processes account for the connection between relationship quality and sibling conflict strategies, it is not feasible to ask children about real-life conflicts since there is reason to believe that these methods fail to differentiate between reality and interpretation. We argue that hypothetical scenarios allow us to disentangle these issues, where in contrast, accounts of real-life conflicts do not. How does the use of hypothetical scenarios allow us to examine the role of interpretation? This methodological approach ensures that the conflict issues are identical for all participants. That is to say, each child is provided with the same information for each scenario. Therefore, the use of hypothetical scenarios allows us to see the difference in how children from different sibling dyads (i.e., those that are more or less positive) are filtering the information that they are provided with. More specifically, we presented children with scenarios in which the perpetrator's intent was ambiguous; as a consequence, we could use children's responses to these scenarios to examine how they interpret their siblings' motives that underlie their actions. In the next section, I will elaborate on previous research that has developed hypothetical scenarios to assess how interpretive processes explain peer conflict dynamics, and how these methods can be fruitfully adapted to examine sibling conflict.

Theory and Research on Social-Information Processing in Peer Relationships

The way a child responds to a situation depends directly on how they mentally process information (Dodge & Schwartz, 1997). A large amount of research has been dedicated to understanding children's interpretation of social interactions and aggression with peers. Studies used to understand peer aggression often apply hypothetical scenarios that are informed by the social information-processing model. Especially relevant to our study is the finding that children who exhibit difficulties in interpreting social cues (e.g., may not be able to correctly identify their peers' intentions) more frequently display aggressive characteristics (i.e., lashing out in an out-of-control manner) (Crick & Dodge, 1996). However, before going into depth about how social-information processing patterns can be linked to aggression, it is imperative to understand the model, which illuminates the steps involved in the processing of social cues.

The social information-processing model is composed of six steps describing the process of how children develop responses to social situations (Dodge & Schwartz, 1997). The first stage of the model consists of encoding social cues, whereby an individual selects certain aspects of situations that catch their attention. The ability to attend to selected cues in the environment and make meaningful sense of what is occurring is essential (Crick & Dodge, 1994; Dodge & Schwartz, 1997). For instance, a child may notice that a toy he/she was playing with is taken away from him/her. The second step is the interpretation and mental representation of social cues; in this step, the information encoded in the first step is now transferred into a child's long-term memory and the child embeds meaning to the interpretation. To establish meaning, the child might create a causal analysis of the events that have taken place and make inferences regarding the other individual's perspective. In other words, in this step, children are trying to understand the motives and intentions of the other person. For example, the outcome for this stage may be that the child interprets the action as someone being mean to them by taking away the toy. These interpretations are influenced by the child's schemas and scripts that have been constructed from previous experiences (Dodge & Schwartz, 1997). This step is fundamental as it influences the preferred choices in the subsequent steps. For the most part, the first two steps are defined together, as the child needs to encode what has happened and interpret the reason for what occurred. The third step involved in the social information-processing model is clarification of goals (Crick & Dodge, 1994; Dodge & Schwartz, 1997). This step consists of a child selecting a goal and the outcome he/she wants to produce from the situation. The outcome at this stage

could be to retrieve a certain toy, to not get in trouble, or to follow the rules. Subsequent to goal selection, the fourth step in the social-information processing model is the response access. During this phase, children use their long-term memory to access behavioral responses (Crick & Dodge, 1994; Dodge & Schwartz, 1997). To provide an example, a child may remember a response he/she previously used in a situation that was quite similar. Innovation of new behaviors takes place when children are unable to retrieve a response that corresponds with their current situation. At the fifth step, children evaluate previous responses that were accessed through their long-term memory and identify a salient response to the social stimuli. At this decision making phase, children could have evaluated numerous responses for the situation and also assessed the possible responses they might receive in the situation. Evaluations of the proper response that take place also stem from how confident the child feels in performing the response, the moral value he/she ascribes to the response, as well as the likeliness of the outcome. The outcome for this stage may be that the child decides that they want to take the toy back from another child. The final step in the social information-processing model occurs when the child chooses a behavioral response and enacts it (Crick & Dodge, 1994).

Although this theoretical framework emphasizes social-cognitive rather than emotional processes, it is important to recognize that the latter also inform children's social-information processing. Specifically, Lemerise and Arsenio (2000) have argued that a child's processing of experiences (including interpretations, goals, and response decisions), includes both affective and cognitive components. This includes the child's emotional intensity, emotional response, affective nature of the child's relationship, temperament, and emotional regulation. Most relevant to this study, the authors suggest that in the second phase of the social information processing model (i.e., the interpretation of social cues) the emotional ties a child has towards another child may influence how they interpret the other's actions. In other words, the child uses prior experiences with that child or scenario to attribute an intent in the current situation. Therefore, it may be that children who have a history of positive interactions may respond in less emotionally intense ways because they perceive their sibling's actions as less hostile, thus, engaging in more constructive conflict strategies. In sum, for a complete understanding of children's social-information processing skills, it is essential to factor in children's emotions, how they regulate them, and also whether these processes vary as a function of the affective qualities of children's relationships.

The current study uses the social information-processing model to account for siblings' aggressive conflict strategies. Primarily, the study focuses on a pattern in the second step of the social information-processing model that has been termed "the hostile attribution bias". This bias results in a type of destructive conflict behavior called reactive aggression. Reactive aggression has been defined as "... aggressive retaliations often prompted by an interpretation that another person has provoked the subject with hostile intent" (Dodge & Coie, 1987). The imperative word in this definition is "interpretation". Specifically, Dodge and Coie (1987) implied that children who exhibit reactive aggression believe their peers' behavior is harmful and purposeful and are thus more likely to respond in aggressive and angry ways to perceived retaliations. These aggressive acts stem from the fact that the child believes he/she need to defend him/herself from provocations by others (Crick & Dodge, 1996; Dodge & Coie, 1987; Mayberry & Espelage, 2007; Price & Dodge, 1989). Another form of aggression that is related to the social information-processing model, specifically in the fifth step, is known as proactive aggression (Crick & Dodge 1996). Proactive aggression is when children evaluate aggressive acts in a way that leads them to enact aggressive behaviors. Children who exhibit proactively aggressive behaviors expect relatively positive outcomes and feel more confident about performing aggressive acts (Crick & Dodge, 1996). Although proactive aggression is not the focus of the study, this type of aggression was measured to distinguish between proactive and reactive aggression in the data.

To elaborate, a series of studies by Dodge and Coie (1987) suggested that boys who exhibited reactively aggressive behaviors were more likely to make errors when interpreting peers' benign intentions. Furthermore, they were more likely to judge hostile intentions in ambiguous situations. These findings suggest that these children overattributed hostility to their peers and acted defensively, leading them to use aggression. Unfortunately, due to these characteristics, children who display reactively aggressive behaviors are more likely to have problems constructing meaningful relationships and have difficulties in using positive problem-solving strategies (Vitaro, Gendreau, Tremblay, & Oligny 1998).

This research has highlighted the differences in interpretive processes between children who display reactive aggression and those who do not. However, these studies speak to stable differences between children, not whether children behave consistently across relationships. Therefore, it is still uncertain whether children interpret others' behavior differently across

relationships with different qualities. As aforementioned, a child's interpretation of another peer's action is argued to be influenced by their previous interactions and the affective quality of their relationship (Lemerise & Arsenio, 2000), thus, if previous interactions with another child were more negative, children may be more likely to respond with emotional high intensity. In other words, children's interpretations and consequent responses to perceived provocation may vary as a function of relationship quality. To examine this precise issue, Peets, Hodges, Kikas, and Salmivalli (2007) conducted a study to see if relationship type was associated with hostile attributions and behavioural strategies. Each child nominated three target peers: (a) a friend, (b) an enemy and (c) a neutral individual. In an individual interview, children answered questions using hypothetical vignettes. For example, in one vignette, children were told that they had spent several days working on a gingerbread house for an exhibition at school. Once at school, they placed the gingerbread house on a table when a classmate bumped into them and the house fell down and broke. Children were then asked: *Why do you think [name] bumped you?* The six vignettes intentionally depicted ambiguity in the provocations to assess children's responses. The purpose of the hypothetical vignettes was to acquire information on whether children would attribute hostile intent and whether it would vary according to the relationship type. In addition, the authors wanted to examine how children would respond to their peer's provocation and which behaviour strategies they would employ. The results indicated that children who attributed more hostility towards their peers also used more aggressive responses. These findings are aligned with Dodge and Coie's (1987) results, however, Peets and colleagues (2007) added to this research by revealing that children did indeed differentiate between relationship types in regards to the number of hostile attributions and hostile strategies they used. Specifically, the authors found that children ascribed less hostility towards friends and also used fewer aggressive strategies in this relationship. In contrast, children attributed more hostility towards disliked peers and hence engaged in more destructive conflict behaviour. Therefore, this study supports the notion that relationship type does affect how often children attribute hostile intentions to others and thus influences the behaviour strategies children use in each relationship.

Arguably, the results of this study can be extended to our understanding of variation in sibling relationships. Specifically, as it was discussed earlier, sibling relations vary in terms of how hostile they are (e.g., Furman & Burhmester, 1985a), in this sense, some sibling relationships may be comparable to children's relations with disliked peers, whereas other

sibling dyads may exhibit qualities that are similar to those observed between children and their friends. This suggests that children who get along with their siblings may show the same pattern as seen in friendships (i.e., using constructive conflict strategies as a consequence of fewer hostile attributions), whereas children who do not get along with their sibling may show the same pattern as disliked peers (i.e., using destructive conflict strategies as a consequence of more hostile attributions). In sum, although it has been identified that variations occur across relationships, the current study will further shed light on how these patterns may differ *within* relationships (i.e., between different sibling dyads) as a function of sibling relationship quality.

Sibling Birth Order

With the exception of twins, research has suggested that birth order can influence siblings' dyadic interactions. Specifically, children take on different roles depending on whether they are the older or younger sibling; these differences in birth order have implications for children's socialization experiences and developmental outcomes (Dunn & Plomin, 1991). Not only are there inherent developmental differences between older and younger siblings (e.g., due to their greater cognitive sophistication, older siblings are able to elaborate on explanations more effectively, while younger siblings use more simplistic tactics), but also role differences (Howe et al., 2011). For instance, older siblings are usually known to take on the "teacher" role and provide more instructional aid when they interact with their younger siblings (Furman & Buhrmester, 1985a; Howe et al., 2011). Thus, the younger sibling is often the recipient of teaching and caregiving (Volling, 2003).

Specific to the present study, older and younger siblings also tend to engage in different techniques during conflict. Older siblings often win more arguments than their younger counterparts (Perlman, Siddiqui, Ram, & Ross, 2000). This could be because older siblings are capable of using more complex problem solving tactics than their younger counterparts and they use more aggressive methods to win a conflict (Recchia & Howe, 2009). In contrast, younger siblings often use more simplistic strategies during conflict, such as crying, since they lack cognitive sophistication (Siddiqui & Ross, 1999). Additionally, they may feel powerless in responding to their older siblings' elaborated arguments (Perlman et al., 2000; Recchia & Howe, 2009). This variation in the strategies implemented during conflict could stem from both developmental and role differences. For instance, developmentally, older siblings have the ability to justify their behaviours by elaborating and explaining their actions, which their younger

counterparts may not be as capable of providing reasons to support their behaviours. With regards to role differences, older siblings may dismiss their younger siblings' actions because they perceive that they are younger and may not be as skilled as them (Howe et al., 2002).

Although research has often compared older and younger siblings, it is often uncertain whether the observed findings are due to role and/or developmental differences. One exception is a study by Martin and Ross (1995). In that study, to understand the development of aggression better, the authors compared 4-year-old first- and second- borns and discovered that even though both groups of children were the same age, the older 4-year-olds siblings exhibited more aggressive behaviours, whereas younger 4-year-old siblings used crying as a strategy. For the purpose of this study, we used a similar strategy. Specifically, we recruited participants between the ages of 6- to-8-years; half were asked to discuss conflict with a younger sibling, and the other half were asked to discuss conflict with an older sibling. In this way we controlled for developmental differences while examining role differences (i.e., in one dyadic pair a younger sibling could be 7-years-old and in another the older sibling could be 7-years-old). Thus, since both older and younger sibling participants were the same chronological age, any observed differences between older and younger 7-year-olds could be attributed to role effects.

The Current Study: Adapting Peer Research for Studying Siblings

The methodological approach used for this research study was strongly influenced by previous studies in peer aggression, specifically, the use of hypothetical vignettes that capture children's attributions of hostile versus accidental intent. However, this hostile/accidental dichotomy suggests that intentions are at one extreme or another (i.e., malicious versus unintentional behaviors), which may not always be the case; thus, additional types of intent were explored in this research. In particular, studies elucidating the distinctive nature of conflict between siblings often report that many disputes originate from sharing resources/property (Howe et al., 2011; Vandell & Bailey, 1992). This suggests that children are focused on achieving their personal goals to fulfill their desires. For example, consider a situation in which a child is watching a particular television show and his/her sibling comes in and switches the channel. This illustration illuminates the idea that the sibling who changed the channel was probably focused on his/her own needs, which was to watch a different show. Using the hostile/accidental dichotomy, an example like this may have been coded as exhibiting hostile intent, when in fact the sibling did not intend to cause purposeful harm. The behaviour of

changing the channel does not constitute as an intentional harm directed towards the sibling, but rather a fulfillment of one's own instrumental goal. This was further explored in a study conducted by Recchia et al. (2013), in which instrumental goals were analyzed in addition to hostile and accidental intent. The results suggested that children distinguish between purposeful harm and instrumental goals in their descriptions of their own and others' behavior. To further understand this distinction, for the purpose of this study, we developed vignettes that distinguished between hostile and instrumental intent, in addition to those distinguishing between hostile and accidental intent.

Past research has revealed that there is an association between siblings' relationship quality and conflict strategies employed (e.g., Rinaldi & Howe, 2003), which we expected to be replicated in the current study. However, the current study also built on past research by attempting to explain this association. That is, children's interpretive processes were hypothesized to play a role in explaining the link between children's relationship quality and conflict strategies. In other words, children's interpretations of hypothetical scenarios were expected to act as a mediator between siblings' relationship quality and conflict strategies they use (see Figure 1). Children who had a more negative sibling relationship were hypothesized to attribute more hostile intentions to their sibling in the hypothetical scenarios, and in turn use more destructive strategies and engage in more reactively aggressive behavior during conflict. In contrast, children who had a more positive relationship with their sibling were hypothesized to attribute more instrumental and accidental intent and in turn employ more constructive strategies and engage in less reactively aggressive behavior during conflict. As noted above, sibling birth order has been associated with sibling conflict processes (Howe, Rinaldi, Jennings, & Petrakos, 2002; Recchia & Howe, 2009; Wilson et al., 2004). In addition, research has observed inconsistency in gender effects in sibling research (see Howe et al., 2002; McGuire et al., 2000). Therefore, associations between siblings' birth order, gender and other variables of interest were also examined, and birth order and gender were controlled in subsequent analyses when relevant.

For this project, children between 6- and 8-years were interviewed by using ambiguous scenarios to assess children's interpretive processes. This method has been used frequently and successfully in research on peer conflicts (Dodge & Coie, 1987; Noakes & Rinaldi, 2006; Peets et al., 2007). Thus, this research project extended methods (i.e., ambiguous scenarios) that are employed in peer studies to understand similar processes in the context of the sibling relationship.

In addition, children completed self-report measures of sibling relationship quality and the conflict strategies they used in sibling conflicts (Recchia & Howe, 2009; Ross, Woody, Smith, & Lollis, 2000). We also included a parent measure of their child's types of sibling-directed aggression (i.e., reactive and proactively aggressive behaviors) because 6- to 8-year-old children may be too young to distinguish between reactive (i.e., response to a provocation) and proactive (i.e., initiating provocation) aggression in response to a questionnaire. Therefore, the child questionnaire provided a more general assessment of constructive vs. destructive conflict strategies. We expected parent's reports of aggressive behaviors to be positively associated with siblings' reports of destructive conflict strategies and negatively to siblings' reports of relationship quality. The current study focused particularly on 6- to 8-year-olds because conflict amongst siblings in middle childhood are poorly resolved and occur quite frequently (Siddiqui & Ross, 1999). Nevertheless, conflict during middle childhood is relatively understudied when compared to the preschool years (see DeHart 1999; Wilson et al., 2004).

Method

Participants and Recruitment

The sample included 122 participants between the ages of 6 and 8 years (M age = 7.45 years). Siblings of participants were up to 4 years older or 4 years younger in age (M age gap = 2.66 years). The age gap between siblings was restricted to eliminate the possibility of recruiting participants whose siblings were too young to play a verbal role in conflict interactions (e.g., 1-year-olds), which could cause children's interpretations of their siblings' behavior to be qualitatively different. In total, 25 girls talked about their sisters and 24 about their brothers. For boys, 35 reported on their sisters, while 38 about their brothers. To assess birth order differences (while holding age constant), participants were evenly divided into groups of children with an older ($n = 62$) vs. younger sibling ($n = 60$). In addition to the two children who were the focus of the study, 46 of the participants had one or more additional siblings.

With respect to family demographics, most mothers had completed a university degree (26%), followed by a postgraduate degree (17%), with some having partially completed university or CEGEP education (15%). Many of the fathers had completed a university degree (24%), followed by some high school completion (20%), with some who had a postgraduate degree (18%). Most families were European Canadians (77%) while the remaining families

included participants of African (i.e., Morocco), Asian (i.e., Philippines), South American (i.e., Chile), and Caribbean descent (i.e., Cuba and Haiti).

Once the study received university and school board ethics approval, participants were recruited by contacting elementary schools (public and private) in and around Montreal, Canada. Once the principals and teachers gave consent, consent forms were handed out to parents of children in Grades 1 and 2. Once consent forms were returned, a research coordinator ensured participants' eligibility by verifying the siblings' ages matched the criteria discussed above. Prior to the interviews being conducted with the participants, verbal assent from the children was also obtained.

Procedure

This project was drawn from a larger investigation of children's conflicts and only the procedures relevant to this thesis will be described here. Well-trained undergraduate and graduate students interviewed participants individually for approximately 30 – 45 minutes at their school. After providing assent, the participant first nominated a friend and a disliked peer in their class (this part of the procedure was relevant to the larger study but is not the focus of this thesis). Next, participants were introduced to six ambiguous scenarios and answered a series of questions about each event; two of these scenarios elicited participants' responses to ambiguous provocation from their siblings, and thus formed the focus of this study. Subsequently, participants answered a series of questions that focused on sibling conflict strategies and relationship quality. At the end of the interview, children received a small gift (e.g., a pencil and eraser) in appreciation of their participation.

Additionally, parent questionnaires were mailed to the parents to have a better understanding of the type of aggressive sibling conflict strategies children employed at home (i.e., whether children engaged in reactive and/or proactive aggression). Parents also provided demographic information about their families. Parents used a self-addressed stamped envelope to return the questionnaire. Once the completed questionnaire was returned, parents were then provided with a \$15 money order as a token of appreciation for their participation in the project. A total of 115 parents returned this questionnaire. The majority of the parents who completed the demographic questionnaire were mothers.

Measures and Coding

Ambiguous provocation scenarios. The order and assignment of scenarios to relationships was counterbalanced across participants. Children were presented with two ambiguous scenarios for each relationship (i.e., sibling, friend, disliked peer); in each case, one scenario was designed to assess children's distinctions between accidental vs. hostile intent (e.g., a friend's soccer ball hits your sand castle) whereas the other was designed to assess distinctions between instrumental vs. hostile intent (e.g., your sibling erases your picture and draws his own). For each scenario, participants were asked questions regarding why the protagonists engaged in such behavior (see Appendix A for scenarios and questions). For this study, the focus was on the first four questions, which were, (a) *What happened?* (b) *Why did NAME ride his/her bike through the puddle?* (c) *What did NAME want?* and last, (d) *What was NAME thinking?*

Participants' attributions of intent in their combined responses to these four questions were coded into four categories (accidental, hostile, instrumental, and Machiavellian). The participant's responses for the four questions were examined together and coded globally, although one response could be coded into multiple categories if children gave multifaceted answers (see Appendix B for definition and examples of codes). For the purpose of analyses, proportions of hostile, accidental, instrumental, and Machiavellian responses to the sibling conflict vignettes were computed (i.e., scores ranged from 0 to 1). Inter-reliability was established between the author and an undergraduate research assistant who was blind to the hypotheses. Two coders independently coded 20% of the data with the following Cohen's *kappas* for each category: hostile = .81, accidental = .91, instrumental = .76, and Machiavellian = .85.

Self-report measures. Children completed self-report measures of their relationship quality (adapted from Ross et al., 2000) and conflict strategies with their sibling (adapted from Recchia & Howe, 2009).

Conflict strategies. The child conflict questionnaire focused on constructive (i.e., apologizing) and destructive (i.e., hit or kick their sibling) strategies for resolving sibling conflict. A total of 10 questions were asked (see Appendix C for all conflict strategy questions), such as, (a) *When you fight with NAME, how much do you hit or kick NAME?* (b) *When you fight with NAME, how much do you solve problems with NAME?* Responses were recorded using a Likert scale (i.e., *Never = 1, Sometimes = 2, Usually = 3, Always = 4*). Additionally, items assessing destructive conflict strategies were reverse scored. Thus, an overall score for children's reports

of constructive behavioural strategies used during conflict was computed. In addition to the interviewer reading each question to the participant, children were also provided with a visual aid to assist them in responding to the scale (see Appendix D). Internal consistency of the scale was adequate (Cronbach's $\alpha = .79$).

Relationship quality. Children reported on positive qualities of their relationship with siblings (see Appendix E). A total of 10 questions were asked, such as, (a) *You and NAME care about each other... How much is that like you and NAME?* and (b) *You and NAME do fun things together... How much is that like you and NAME?* Responses were recorded using a Likert scale (i.e., *Not at all = 1, A little = 2, Pretty Much = 3, A lot = 4*). Overall scores for sibling relationship quality were computed by averaging across the 10 items on this scale, after items assessing negative relationship dimensions had been reverse-scored. In addition to the interviewer reading each question to the participant, children were also provided with a visual aid to assist them in responding to the scale (see Appendix F). Internal consistency of this scale was high (Cronbach's $\alpha = .92$).

Parent measures. In addition, parents completed questionnaires on (a) siblings' aggressive conflict strategies and (b) demographics.

Conflict questionnaire. Parents' provided descriptions of children's proactive and reactive sibling conflict strategies (see Appendix G). Specifically, parents were asked questions such as *When CHILDNAME and TARGETNAME have conflicts, how much is each of the following statements true of CHILDNAME?* a) *If TARGETNAME hurts CHILDNAME, CHILDNAME fights back* (reactive aggression), and b) *CHILDNAME starts fights with TARGETNAME to get what he/she wants* (proactive aggression). Responses were recorded using a Likert scale (i.e., *Not at all = 1, A little = 2, Pretty much = 3, A lot = 4*). The internal consistency of each scale was adequate (α s = .73 and .75 for reactive and proactive aggression, respectively). Overall scores for parents' reports of reactive and proactive aggression used during disputes was computed.

Demographic questionnaire. Parents completed a demographic questionnaire. If applicable, information regarding both parents was elicited. Questions pertained to level of parents' education completed (i.e., no high school, high school, college, university, etc.), parents' age, occupation of each parent and ethnic background (see Appendix H for list of all questions).

Results

Plan of Analysis

Preliminary analyses were conducted examining links with gender and birth order. Consequently, analyses focused on whether children's interpretations of ambiguous scenarios explained the associations between relationship quality and conflict strategies. Specifically, correlations were computed between intent categories based on vignettes, measures of relationship quality and measures of conflict strategies. Then, mediation was explicitly tested using the Sobel test in multiple regression analysis, while controlling for age gap and gender, as relevant.

How are birth order and gender related to attributions of intent, relationship quality, and conflict strategies?

Analyses did not reveal any unique or interactive effects of gender on attributions of intent, reports of relationship quality, or any of the measures of conflict strategies; therefore, gender was excluded from subsequent analyses.

A series of one-way ANOVAs examining attributions of intent as a function of sibling birth order revealed significant effects of birth order on hostile attributions, $F(1, 120) = 10.16, p < .05$, partial $\eta^2 = .08$, and instrumental attributions, $F(1, 120) = 4.84, p < .05$, partial $\eta^2 = .04$. When the participant's sibling was older, more hostile intent was described ($M = .40, SE = .05$), as compared to when the participant's sibling was younger ($M = .18, SE = .05$). In terms of instrumental attribution, participants attributed less instrumental intent to older siblings ($M = .34, SE = .31$) than to younger siblings ($M = .43, SE = .03$). The birth order effects for Machiavellian and accidental intent were not significant.

One-way ANOVAs failed to reveal significant effects of birth order on siblings' reports of conflict strategies or relationship quality. In contrast, a series of one-way ANOVAs examining parent reports of types of aggression used during conflict (i.e., reactive and proactive) as a function of sibling birth revealed a significant effect for reactively aggressive behaviors, $F(1, 113) = 6.10, p < .05$, partial $\eta^2 = .05$. When the participant was the younger sibling, parents reported that the child engaged in more reactively aggressive behaviors ($M = 2.41, SE = .09$). In comparison, when the participant was the older sibling, parents described that the child engaged in fewer reactively aggressive behaviors ($M = 2.11, SE = .09$). The association between parents' report of proactively aggressive behaviors during conflict and birth order was not significant.

How are children's reports of conflict strategies related to parents' reports of types of aggression employed during conflict?

The following partial correlations are reported with sibling birth order controlled. Significant partial correlations were observed between children's reports of conflict strategies and parents' reports of reactive aggression (see Table 1). Specifically, when children described using fewer constructive strategies during conflict, parents reported that their child displayed more reactively aggressive behaviors during disputes. Additionally, significant partial correlations were observed between parents' reports of proactive and reactive behaviors during conflict (see Table 1); parents reported that children who engaged in more reactively aggressive behaviors also exhibited more proactively aggressive behaviors.

How are children's reports of relationship quality related to conflict strategies used and types of aggression employed during conflict?

With birth order controlled, a significant partial correlation was observed between children's reports of conflict strategies and relationship quality (see Table 1). The results supported our hypothesis, namely, children who reported more constructive conflict strategies during disputes also reported that they had a better quality relationship with their sibling. Significant partial correlations were also observed between children's reports of relationship quality and parents' reports of both proactive and reactive aggression during conflict (see Table 1). Specifically, when children described their relationship quality to be poorer, parents reported that the child engaged in more proactive and reactive behaviors during disputes.

How are children's reports of relationship quality associated with their attributions of intent in response to ambiguous provocation?

While controlling for birth order, a significant negative partial correlation was observed between children's relationship quality and hostile attributions (see Table 2). Aligned with the study's hypothesis, when children's relationship quality was poorer, children attributed more hostile intent to their siblings in response to the ambiguous scenarios. Also, a positive partial correlation was observed between children's relationship quality and instrumental intent (see Table 2). When children's relationship quality was friendlier, they provided more instrumental intent attributions in response to ambiguous scenarios.

How are children's attributions of intent associated to children's conflict strategies and types of aggression?

A positive partial correlation was observed between children's report of conflict strategies and attribution of instrumental intent (see Table 2). These results were aligned with the study's hypothesis, specifically, when children used more constructive strategies during disputes, they also were more likely to attribute instrumental intent to their sibling in the ambiguous scenario. No significant partial correlations were observed between parent reports on reactive and proactive aggressive behaviors and children's attribution of intent.

Do attributions of intent mediate the relationship between sibling's relationship quality and conflict strategies employed?

Based on the correlations observed above, we tested whether hostile and instrumental attributions of intent mediated the association between relationship quality and children's reports of conflict strategies. Sobel tests revealed that neither variable was a significant mediator (z s $< .42$, $ps > .05$).

Table 1

Partial Correlations between Reports of Sibling Conflict Strategies, Proactive and Reactive Aggression, and Sibling Relationship Quality

	Constructive Conflict Strategies	Proactive Aggression	Reactive Aggression
Constructive Conflict Strategies (child report)	--		
Proactive Aggression (parent report)	-.03	--	
Reactive Aggression (parent report)	-.25*	.64*	--
Relationship Quality (child report)	.60*	-.19*	-.22*

Note. * $p < .05$. Correlations are reported with sibling birth order controlled.

Table 2

Correlations Relationship Quality, Conflict Strategies, Types of Aggression, and Attributions of Intent

	Hostile Intent	Instrumental Intent	Machiavellian Intent	Accidental Intent
Proactive Aggression (parent report)	.02	-.07	-.04	-.16
Reactive Aggression (parent report)	-.05	.01	-.07	-.08
Conflict Strategies (child report)	-.16	.20*	-.00	.04
Relationship Quality (child report)	-.21*	.30*	-.11	.06

* $p < .05$. Correlations are reported with sibling birth order controlled.

Discussion

The goal of this study was to determine whether children's interpretations of ambiguous scenarios mediated the association between sibling relationship quality and conflict strategies. To build upon previous studies on sibling research, this study used a distinct methodological approach. Specifically, whereas previous sibling research typically focused on real-life conflicts (e.g., McGuire et al., 2000; Wilson et al., 2004) the current study used hypothetical ambiguous provocation scenarios to assess children's interpretative processes. The scenarios were adapted to differentiate not only between accidental/hostile intent but also between instrumental/hostile intent. The results of this study revealed that there are associations between attributions of intent, sibling relationship quality and reports of children's sibling conflict strategies. In addition, the results suggested that sibling birth order is related to how children interpret ambiguous scenarios.

In the next section, I will discuss the link between birth order and attribution of intent in response to the ambiguous vignettes. Subsequently, I will address the associations between sibling relationship quality and conflict strategies. This will be followed by a discussion of the links between children's relationship quality and attribution of intent. From there, I will discuss the links between children's attribution of intent and conflict strategies used during disputes, as well as the results of the mediation model proposed in this study. Finally, limitations and implications of the study will be identified.

Birth Order, Attributions of Intent and Conflict Strategies

Previous research has shown links between conflict strategies and sibling birth order (Recchia & Howe, 2009). However, with a few exceptions (e.g., Martin and Ross, 1995), previous sibling research has not clearly demonstrated whether role or developmental differences are explaining differences between first-born and second-born siblings. Specifically, many observed differences between how children perceive their siblings' actions could be developmental differences. Research has consistently found that chronologically older siblings exhibit greater cognitive sophistication when compared to their younger siblings (Howe et al., 2002). Inasmuch as first-born children participating in research are often chronologically older than second-born siblings in the same study (e.g., Recchia & Howe, 2009) this could explain why first-born siblings exhibit more complex thoughts and interpretations surrounding sibling conflict. In contrast, for this study, we were able to distinguish between role differences (i.e., whether children are reporting on an older or younger sibling) and developmental differences by

holding age constant. The findings suggested that younger and older siblings view each other's actions differently during disputes. Specifically, participants reported their older siblings' intent as more hostile. In comparison, participants who had younger siblings were more likely to interpret their sibling's actions as either instrumental or accidental. Thus, by holding age constant, we were able to see that despite being chronologically the same age, therefore developmentally similar, participants' interpretations of their siblings' behavior were associated with birth order. Children may be more likely to attribute hostile intent to their older sibling since older siblings employ more aggressive behaviors in comparison to younger siblings during conflict (Recchia & Howe, 2009). Therefore, because older siblings engage in more aggressive behaviors in actual conflicts, younger siblings may be using these previous experiences to interpret ambiguous scenarios.

In contrast to past research, a significant association was not observed between children's reports of conflict strategies and birth order. However, there was a significant association between parents' report of reactive aggression and birth order. Specifically, parents reported that younger siblings engaged in more reactively aggressive behaviors during conflict, whereas, they reported older siblings exhibited fewer reactively aggressive behaviors. To our knowledge, the link between reactively aggressive behaviors and birth order has not previously been identified in the sibling literature. There are various possible explanations for this association. First, it may be that parents are stricter with older siblings; therefore, lashing out may be a somewhat more acceptable conflict strategy for younger siblings as compared to older siblings. Alternatively, parents and older siblings may view the younger sibling as less powerful and knowledgeable due to their role in the family. Thus, the younger siblings use more simple strategies such as crying and lashing out to get what they want, which resemble the characteristics associated with reactive aggression.

Relationship Quality and Conflict Strategies

The present findings observed with respect to the association between relationship quality and conflict strategies are similar to previous research (Recchia & Howe, 2009; Rinaldi & Howe, 1998) and aligned with my hypotheses. Specifically, when children had a more negative relationship with their sibling they also employed more destructive conflict strategies. In turn, children who had a more positive relationship with their sibling used more constructive conflict strategies during disputes. This suggests that when siblings get along and like each other they are

more likely to use conflict strategies that will not negatively affect their relationship. Previous research, specifically Recchia and Howe (2009a), suggested that children who have a more positive relationship quality with their sibling might actually be more motivated to resolve conflict in a constructive manner.

Furthermore, according to peer research, children have a difficult time in creating positive relationships with their peers when the child displays reactive and proactive aggressive behaviors (Dodge & Schwartz, 1997). In this study, the associations observed between children's reports of their relationship quality and parents' reports of aggressive behaviors (i.e., reactive and proactive), suggest that this may also be the case between siblings. Specifically, when children described their sibling relationship quality as negative, parents reported that children engaged in more aggressive behaviors during conflict. It is not surprising that when siblings are frequently employing destructive conflict strategies and aggressive behaviors they will not get along as well. In this sense, it is uncertain whether destructive conflict strategies lead to lower relationship quality or vice versa or if positive relationship quality leads to more constructive conflict strategies or vice versa. Although both mechanisms are plausible, our correlational data do not allow us to differentiate between them.

Relationship Quality and Attribution of Intent

As noted in the previous section, associations between relationship quality and conflict strategies are well-established in the literature. However, the current findings on the associations between children's relationship quality and attributions of intent are novel to sibling research. As expected, significant associations between relationship quality and attributions of intent were observed. Specifically, when children described their relationships as more negative they attributed more hostile intent and less instrumental intent to their siblings. To illustrate this pattern, when presented with ambiguous scenarios, children with a positive sibling relationship would often respond with statements such as "He wants to make a castle, so he broke mine, so he'll have more space and more sand to make one." This suggests that although harm had taken place (i.e., destroying the castle), children believed that their sibling's action was not intended to harm them but was rather goal oriented. Somewhat surprisingly given past research with peers (Peets et al., 2007), attributions of accidental intent were not significantly associated with sibling relationship quality. It may be that children's attributions of instrumental intent are more diagnostic of having a positive sibling relationship because the hostile/instrumental scenarios

were particularly ecologically valid for siblings. In other words, the scenarios that distinguished between hostile/instrumental intent were possibly more realistic and relevant to the participants when compared to hostile/accidental scenarios. Siblings often share resources within the home environment, so it is likely that at some point both siblings want access to identical materials at the same time to fulfill their own needs (Howe et al., 2013). Therefore, it could be that children are making sense of these scenarios based on their prior interactions with their brother or sister. Thus, when children are attributing instrumental vs. hostile intent, they may be grounding their interpretation in how they have already interacted with their siblings in a similar situation in the past.

More broadly speaking, the fact that we observed links between relationship quality and attributions of intent is consistent with past research by Peets et al. (2007). They found that children attribute more accidental intent to their friends and more hostile intent to disliked peers. Thus, it may be that children who attributed more instrumental intent to their siblings have a relationship that is similar to friendships (i.e., caring and kind) (Recchia et al., 2013), whereas children who attributed more hostile intent to their siblings may have relations that are more similar to those between disliked peers (i.e., less warmth). Theorists have noted that the nature children's emotional ties may influence how they encode and interpret the behaviors of others (Lemerise & Arsenio, 2000). Our findings provide empirical support for this proposal in the context of the sibling relationship, inasmuch as children who previously experienced less warmth with their siblings were likely to attribute hostile intent.

Attribution of Intent and Conflict Strategies

The findings also revealed an association between children's attributions of instrumental intent and the conflict strategies they reported employing during disputes. Consistent with the hypotheses, these findings imply that children do not view their sibling's actions as only hostile or accidental, but also instrumental (i.e., goal oriented). Furthermore, when children reported more instrumental intent in the scenarios, they were more likely to engage in constructive conflict strategies (i.e., negotiation to solve problems or talking calmly to their sibling during conflict). Surprisingly, unlike what has been found in peer research (Peets et al., 2007) there was no significant association between accidental intent and constructive conflict strategies. Perhaps the association between instrumental intent and constructive strategies was observed in this study (and not between accidental intent and constructive strategies) because of the unique nature of

sibling relationships. Growing up in the same household, siblings share resources and, at times, they may want access to those resources at the same time (Howe et al., 2011). As was discussed earlier, in these situations, children may be focused on fulfilling their own needs, which sometimes can be at the cost of the other sibling's needs. Following from these experiences, if children interpret their sibling's intent as instrumental rather than purposefully harmful, they may respond with conflict strategies that are more constructive because they interpret the harm not as intentional, but rather as side effect of goal-directed behavior.

In contrast, associations between attributions of intent and parents' reports of sibling aggression (i.e., reactive and proactive) were not significant. A plausible explanation to why this study revealed associations with the child measures and not the parent measures could be due to a difference in how the conflict is perceived by the child and the parent. In other words, the child may view the dispute differently than the parent because he/she has directly experienced the provocation, whereas parents are merely observing the conflict. Moreover, although both child and parent questionnaires measure conflict strategies used during disputes, they differed in their focus. The child conflict strategies questionnaire provided a more general assessment of constructive or destructive conflict strategies, whereas the parent questionnaire more specifically measured types of aggression. Thus, it may be children's interpretations of ambiguous scenarios are more closely linked to general conflict strategies than particular types of aggression.

Types of Aggression and Conflict Strategies

The results revealed an association between children's reports of conflict strategies and parents' reports of reactive aggression. Consistent with peer research and the study's hypotheses, children who use fewer constructive strategies during conflict also displayed reactively aggressive behaviors during disputes. The outcome of this association is not surprising since peer research has often found similar results, in that children who exhibit reactively aggressive behaviors often employ destructive conflict strategies with their peers (Dodge & Coie, 1987). In addition, parents reported that children who engaged in more reactively aggressive behaviors also engaged in more proactive aggression. Once again, these findings are not unexpected as children who exhibit aggressive behaviors can employ a combination of both reactive and proactive aggression, also known as Machiavellian intent (Hawley, Little, & Pasupathi, 2002).

Mediational Model

The proposed mediational model was not significant for this study. Specifically, attributions of intent did not explain any of the observed associations between sibling relationship quality and conflict strategies. As discussed above, although the proposed mediational model was not significant, results did reveal that relationship quality was associated with both conflict strategies and attributions of intent. However, the correlations between attribution of intent and conflict strategies were relatively modest in magnitude and scope. This suggests that perhaps an alternative conceptual model would provide a better fit with the data. Specifically, it may be that relationship quality acts as a mediator to explain the association between attributions of intent and conflict strategies (see Figure 2). A second possibility is that relationship quality is independently linked to attribution of intent and conflict strategies but that there is no direct connection between the latter two variables (see Figure 3). In other words, perhaps the direct association between conflict strategies and attribution of intent is spurious. Although both of these proposed models are in line with our data, it will rest with future researchers to disentangle the relationships between these variables.

Limitations

Limitations of this study include the lack of diversity in the sample. Specifically, the participants recruited for this study were primarily of Canadian or European descents from middle class families. This limits the extent to which the results can be applied to other ethnic or socioeconomic groups since siblings' relationships may be viewed differently across cultures (see Brody, Stoneman, Smith, & Gibson, 1999). Future research should incorporate participants from multiple cultures to ensure generalizability of the findings.

The challenges associated with coding children's responses to ambiguous scenarios constituted an additional limitation. Specifically, some participants would respond to an ambiguous scenario with two attributions of intent (i.e., hostile *and* instrumental). This most likely occurred because the first four questions in the interview (see Appendix A) were intentionally designed to be partially redundant so as to ensure at least one codable response, since the children interviewed were quite young. However, due to the repetitive nature of the questions, children may have changed their responses midway through the interview because they wanted to provide the "correct" answer. To deal with this issue, we considered the possibility of coding only the child's first response or most salient response. However, both of

these strategies included their own drawbacks, and thus it was decided to include all codable responses in the analyses. Nevertheless, this represents a limitation of the present study.

Finally, a longitudinal design that included measures of all variables at various timepoints would have permitted a stronger test of causality in the proposed mediation model. In other words, more than one time point is required to see how one variable predicts changes in other variables over time. Therefore, the cross-sectional nature of our data is a limitation of the present study.

Implications and Conclusions

Considering the complex interactions between siblings, this research project contributes to a better understanding of the multifaceted nature of sibling relationships. Research has often reported that the ability to solve disputes constructively (i.e., problem solving and negotiation) with siblings is a crucial skill because children will eventually employ the same strategies in other relational contexts (Rinaldi & Howe, 1998; Shantz 1987). With the use of hypothetical scenarios, this study has built on previous research towards an understanding of how children's interpretive processes in conflict are linked to birth order, relationship quality, and conflict strategies. Previous literature on sibling conflict made it difficult to differentiate between the reality and interpretation of conflict. However, by providing identical ambiguous scenarios to all of the participants, our data support the notion that interpretative processes are linked to both relationship quality and sibling conflict strategies. In addition, this study recognized that children's interpretations of their sibling's actions don't include solely accidental or hostile attributions, but also include attributions of instrumental intent. Our findings suggest that when children interpret harm as goal-directed but not malicious, not only are they more likely to respond with constructive conflict strategies, but also have a positive relationship quality. Therefore, these findings contribute to our understanding of the motivational bases of sibling conflict, which could lead to improvements in interventions or techniques for parents to support constructive sibling conflict processes. In particular, the findings of this study imply that interpretative processes have a role in sibling conflict. Thus, it may be useful for parents to challenge misunderstandings that may have occurred by encouraging the child to reflect on the other's conflict perspective. For instance, asking each sibling (in the presence of the other) what he or she thought happened and to describe the goals that they wanted fulfill could be a guide in constructive problem solving. Moreover, it may be valuable for parents to promote children's

self-reflection on their own conflict attribution processes and how they are connected to their sibling relationship histories. Specifically, parents can provide children with an opportunity to explore and explain why they believed that their brother was being hostile towards them; perhaps the child thought their sibling was being hostile because of their past incidents? Or perhaps it was due to other reasons? By consistently promoting self-reflections in addition to children's awareness and understanding their sibling's actual intentions, destructive conflict strategies might plausibly be reduced, although additional research is needed to test this possibility. With respect to research, our results also imply that future studies of sibling conflict could benefit from the inclusion of methodologies based on hypothetical scenarios and that include assessments of instrumental intent to gain a greater understanding of how children's construals inform sibling relationship quality and sibling conflict behaviors.

Figure 1: Mediation Model



Figure 1: In this study, we propose a mediation model whereby siblings' attributions of intent explain the association between relationship quality and conflict strategies.

Figure 2: Alternative Mediation Model



Figure 2: An alternative mediation model whereby siblings' relationship quality explains the association between attribution of intent and conflict strategies.

Figure 3: Relationship Quality Independently Linked to Conflict Strategies and Attribution of intent

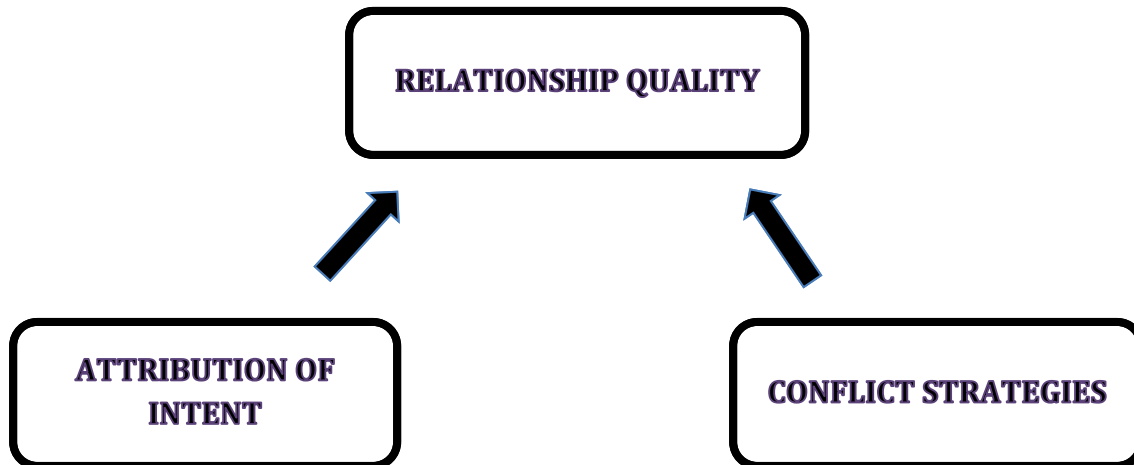


Figure 3: A model illustrating how attribution of intent and conflict strategies may be independently linked to relationship quality. In this case, the direct link between attribution of intent and conflict strategies is spurious.

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Appendix A: Scenarios and Questions

“A” SCENARIOS

TARGET: _____

NEW SHOES

- 1) You are walking on the sidewalk after school, wearing your brand new shoes. There are mud puddles in the road. You see NAME riding by on his/her bike.
- 2) As _____ rides by you, he/she hits a puddle and mud splashes all over your shoes.

What happened?

Why did NAME ride his/her bike through the puddle?

What did NAME want?

What was NAME thinking?

Was it okay or not okay that NAME rode through the puddle?

Why/why not?

How would you feel if this happened to you?

Why?

What would you do if this happened to you?

Why?

ART SUPPLIES

- 1) You decide to clean up the art supplies, and you put all the markers and paints back neatly in their box. You leave to go play outside.
- 2) When you come back, you see that _____ has taken all of the markers and paints out of the box and they are all over the room in a mess.

What happened?

Why did NAME take the supplies out of the box?

What did NAME want?

What was NAME thinking?

Was it okay or not okay that NAME took the supplies out of the box?

Why/why not?

How would you feel if this happened to you?

Why?

What would you do if this happened to you?

Why?

“B” SCENARIOS

TARGET: _____

SAND CASTLE

- 1) You are playing in the sandbox, making a cool castle out of sand. You see _____ playing with a ball nearby. You finish building your castle.
- 2) All of a sudden, _____’s ball hits your castle and destroys it.

What happened?

Why did NAME hit your castle with his/her ball?

What did NAME want?

What was NAME thinking?

Was it okay or not okay that NAME hit your castle with his/her ball?

Why/why not?

How would you feel if this happened to you?

Why?

What would you do if this happened to you?

Why?

TOWER OF BLOCKS

- 1) You are building a gigantic tower out of the blocks. You leave the room to go get a snack.
- 2) When you come back, you see that _____ has taken apart your tower and put all the blocks back in their bag.

What happened?

Why did NAME take apart your tower?

What did NAME want?

What was NAME thinking?

Was it okay or not okay that NAME took apart your tower?

Why/why not?

How would you feel if this happened to you?

Why?

What would you do if this happened to you?

Why?

“C” SCENARIOS

TARGET: _____

PUMPKIN

- 1) You carve an awesome pumpkin for a Halloween pumpkin-carving contest at school. You put the pumpkin carefully in a bag to take to school. You see _____ running towards you.
- 2) Suddenly, _____ bumps your bag, and your pumpkin falls and smashes on the ground.

What happened?

Why did NAME bump your bag?

What did NAME want?

What was NAME thinking?

Was it okay or not okay that NAME bumped your bag?

Why/why not?

How would you feel if this happened to you?

Why?

What would you do if this happened to you?

Why?

CHALKBOARD

- 1) You are drawing a really nice picture of your family on the chalkboard. You leave the room to go get your mom/teacher to show her.
- 2) When you come back, you see that _____ has erased your picture and drawn a picture of a dragon instead.

What happened?

Why did NAME erase your picture?

What did NAME want?

What was NAME thinking?

Was it okay or not okay that NAME erased your picture?

Why/why not?

How would you feel if this happened to you?

Why?

What would you do if this happened to you?

Why?

Appendix B: Coding Scheme

Responses to: *What happened?, Why did he/she do it?, What did he/she want?, and What was he/she thinking?*

Coding	Hostile	HOS
Description	The focal child interprets the target child's action to specifically hurt the focal child emotionally and/or physically	
Example	<p>ID # 72: "Because he wanted me to get in trouble, I think. He wanted to be mean to me. He was thinking, he would tell our mother and then I would get in trouble and in time out and like go to bed early."</p> <p>ID # 93: "Because he wanted my shoes – because he didn't like my shoes and he wanted them to get dirty."</p>	
Coding	Instrumental	INST
Description	The focal child interprets the action as goal oriented but in a nonhostile way. The target is attempting to achieve a goal, but that goal is not malicious in any way.	
Example	<p>ID # 75: He was thinking that... He was saying in that "I want to draw a picture on the chalkboard."</p> <p>ID # 68: "My ?? ?? erased my picture and drew another one. And maybe she didn't know that I was gonna go show my mom. She wanted to draw a picture but she didn't know that I was gonna show..."</p> <p>ID # 73: "He wanted to play with them. ?? wasn't thinking that I would come back."</p> <p>ID # 34: "Because she thought that she was finished, so she thought it was time to finish. She was thinking to clean up the room. She was thinking to clean up the room."</p> <p>ID # 36: "That somebody had been playing</p>	

	with it, but then the person didn't want to clean it up so they went playing with another game and he decided to clean it up."	
Coding	Accidental	ACC
Description	The focal child interprets the target child's action as accidental. The focal child understands the action of the target child is not to cause harm. (Target child is unaware that he/she is causing harm; lack of intent)	
Example	<p>ID # 6: "He probably didn't mean to. It was probably just an accident because I walked in front of him right when he was about to collide with me. So. It would have been an accident."</p> <p>ID # 9: "Well, maybe because she just meant to kick it around...the, the sandbox. Like, beside it. But, it fell on the sand fort. Maybe she just wanted it to go around...it. That...that the ball won't go on the sand fort."</p>	
Coding	Machiavellian	MAC
Description	Focal child interprets the target child's action as hostile, however, the end result indicates the target child was attempting to achieve a nonhostile goal in a malicious way. Hostile means to an instrumental end.	
Example	ID 62: "[TARGET CHILD] just wanted to play with me and they, and he, he wanted to play with me so that when he splashed the puddle at me he wanted him to notice me."	
Coding	Uncodeable	UNC
Description	When the child does not provide enough information for it to be coded as any of the above codes.	

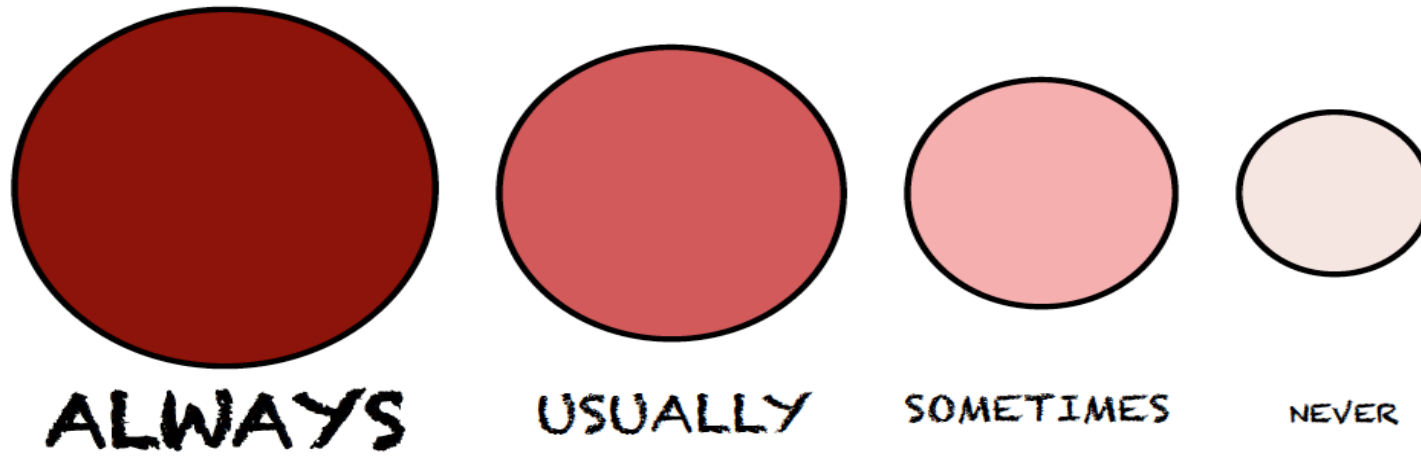
Example	ID # 36: “It got crushed. Cuz he likes playing soccer. DO YOU THINK? WHEN HE WAS KICKING THE BALL AROUND? WHAT DID HE WANT? I don't know. YOU DON'T KNOW? SO IF HE WAS RUNNING AROUND NEXT TO YOUR SAND CASTLE WHY WOULD HE HAVE KICKED THE BALL? I don't know. IT'S OKAY WE CAN SKIP THAT ONE.”
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Appendix C: Participant Conflict Strategies Questionnaire

All kids sometimes have fights with their classmates (brother/sister). So I want to know what it's like when you have fights with _____.
When you fight with NAME, **how much** do you:

<i>When you fight with NAME, how much do you _____ ?</i>	NEVER	SOMETIMES	USUALLY	ALWAYS
Let NAME have his/her own way?				
Solve problems with NAME?				
Call NAME names?				
Hit or kick NAME?				
Talk calmly to NAME?				
Yell or scream at NAME?				
Say you're sorry to NAME?				
Make NAME cry?				
Blame NAME for the fight?				
Try to find a way for both you and NAME to get what you want?				

Appendix D: Visual Aid Provided to Children to Answer Conflict Strategy Questions

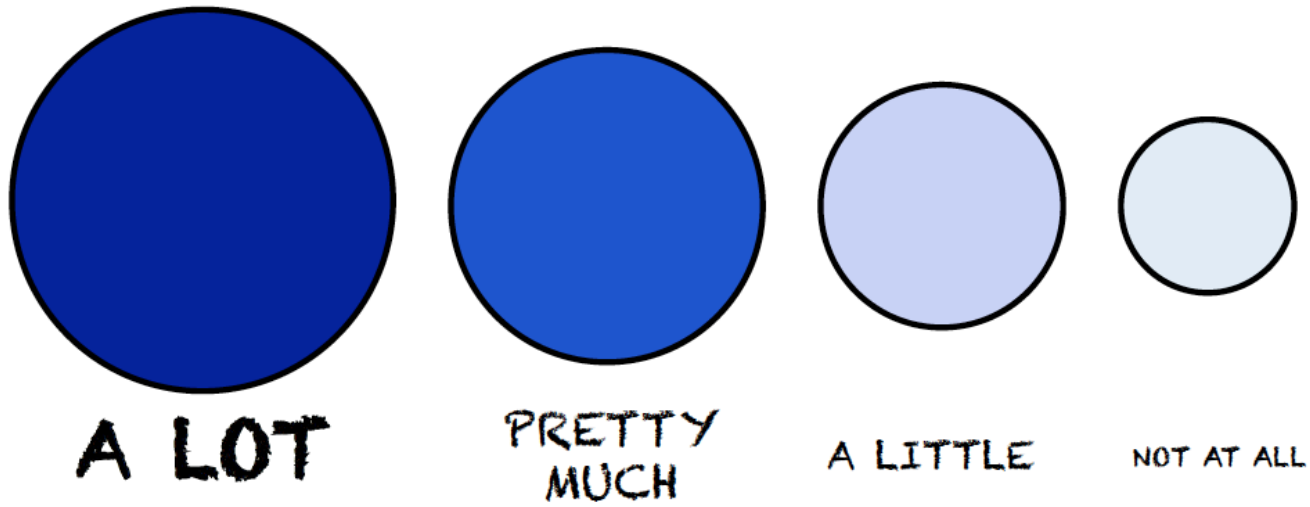


Appendix E: Participant Relationship Quality Questionnaire

I'm going to tell you some things about some kids. I want you to tell me if that's what it's like for you and _____.

<i>How much is that like you and NAME?</i>	NOT AT ALL	A LITTLE	PRETTY MUCH	A LOT
You and NAME care about each other.				
You and NAME do fun things together.				
You and NAME are nice to each other.				
You and NAME fight with each other.				
You and NAME like each other.				
You and NAME like to do things together.				
You and NAME share with each other.				
You and NAME help each other.				
You and NAME are mean to each other.				
You and NAME have good times together.				

Appendix F: Visual Aid for Children to Answer Relationship Quality Questionnaire



Appendix G: Parent Conflict Strategies Questionnaire

Please indicate your answers by putting an X in one of the four boxes on the right.

When CHILDNAME and TARGETNAME have conflicts, how much is each of the following statements true of CHILDNAME?

	NOT AT ALL	A LITTLE	PRETTY MUCH	A LOT
If TARGETNAME hurts CHILDNAME, CHILDNAME fights back.				
CHILDNAME starts fights with TARGETNAME to get what he/she wants.				
CHILDNAME hurts TARGETNAME to get what he/she wants.				
If TARGETNAME makes CHILDNAME angry, CHILDNAME hurts TARGETNAME.				
If TARGETNAME upsets CHILDNAME, CHILDNAME says mean things to TARGETNAME.				
CHILDNAME says mean things to TARGETNAME to get what he/she wants.				

Appendix H: Demographic Questionnaire

Information about Children:

CHILDNAME's Gender: Male Female
CHILDNAME's Date of Birth: Month _____ Year _____

SIBNAME's Gender: Male Female
SIBNAME's Date of Birth: Month _____ Year _____

SIBNAME is CHILDNAME's:

- Biological sibling
- Half-sibling
- Step-sibling
- Adoptive sibling

Have CHILDNAME and SIBNAME lived together since birth?

Yes No

If not: How many years have CHILDNAME and SIBNAME lived together? _____

Information about you:

I am CHILDNAME's:

- Mother
- Father
- Legal guardian

Parent/Guardian's Age: _____

Parent/Guardian's Job Description: _____

Parent/Guardian's Ethnic Background: _____

Parent/Guardian's country of birth:

Canada Other

If other: Country where mother was born: _____

Number of years in Canada: _____

Parent/Guardian's Education (check the box that is your highest level of education):

- No high school
- Some high school
- High school completion/equivalency
- Some college/CEGEP
- College/CEGEP degree
- Some university
- University degree
- Postgraduate degree

Information about Child's Second Parent:

CHILDNAME's other parent is:

- Mother
- Father
- Legal guardian
- N/A: I am a single parent or sole guardian

Other Parent's Age: _____

Other Parent's Job Description: _____

Other Parent's Ethnic Background: _____

Other Parent's Country of Birth:

Canada Other

If other: Country where father was born: _____

Number of years in Canada: _____

Other Parent's Education (check the box that is their highest level of education):

- No high school
- Some high school
- High school completion/equivalency
- Some college/CEGEP
- College/CEGEP degree
- Some university
- University degree
- Postgraduate degree

Information about Your Family:

Are there other children in the family besides CHILDNAME and SIBNAME?

Yes No

If yes, please indicate if boy(s) or girl(s) and birth dates (Month, Year).

What language(s) do your children speak regularly at home?

- English
- French
- Other (please specify): _____

Future Research:

Are you interested in being contacted about future research studies?

Yes No