

Social-Cognitive Predictors of Siblings' Self-Serving Biases

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ABSTRACT

Social-Cognitive Predictors of Siblings' Self-Serving Biases

Holly Recchia

This study investigated the associations between children's social-cognitive abilities, their conversations about internal states with family members, and their later self-serving biases in descriptions of the sibling relationship. At Time 1, 32 preschoolers were observed during two naturalistic interaction sessions with mothers and younger siblings. Various features of mothers' and children's internal state (IS) language were coded. Each child also completed a battery of three social-cognitive measures. Two years later, 26 children were interviewed about various aspects of their sibling relationship, and responses were coded for five measures of self-serving bias. Although children's social-cognitive skills were not strongly related to their later self-serving biases, there were a number of associations between families' IS talk and children's later biases. In general, results indicated that children who were other-oriented in the content and function of their IS language and who discussed internal states in causally connected ways tended to exhibit fewer self-serving biases two years later. In addition, when mothers were attentive to their children in conversations about internal states (as opposed to ignoring them, or being selectively focused on the baby), children tended to have fewer self-serving biases two years later. Thus, these results support the social-constructivist notion that the quality of children's earlier interactions with family members is related to the way they construe themselves in comparison to their siblings.

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Social-Cognitive Predictors of Siblings' Self-Serving Biases

In the context of an argument, it is relatively common to believe that your antagonist is at fault. When in the heat of a dispute, even adults occasionally have difficulty seeing both sides of the story. In this situation, most people can attest to the fact that it is challenging to step back and strive for a true sense of objectivity. It becomes very difficult to admit to being partially responsible for a fight, and that one's own actions may not be entirely innocent. However, this self-serving bias makes good sense, considering the role that it can play in protecting a positive self-view (see Kunda, 1990, for a review). Although most people want to see the world in an accurate way, sometimes it is even more important for us to believe that we are inherently good. One effective way of coming to this conclusion is to construct a mental world in which our actions are justifiable and our motivations are pure. The outcome of this biased thinking is a life history that is coloured by the desire to perceive one's own past actions in a particular way.

One factor that contributes to our biased perceptions (beyond self-enhancement goals) is our privileged access to our own internal states. In most situations, we tend to be aware of our own goals, emotions, and the reasons for our actions. However, we must resort to guessing what others are thinking, wanting, or feeling, based on their actions and what limited information they choose to share with us. For young children, this is a particularly difficult task, due to their restricted ability to take the perspectives of others. As a result, a biased view of the world may be especially pronounced in children, who have limited insight into others' internal states, but nevertheless a strong motivation to perceive themselves positively. In the context of a conflict, this could lead children to

focus selectively on the overt negative actions of their opponent, failing to notice both their own transgressions and the reasons underlying the actions of the other. Because children have little insight into the motivations and emotions underlying others' contentious behaviour, and simultaneously wish to perceive themselves as relatively blameless, it is not surprising that they would encode and remember a relatively egocentric version of events.

The sibling relationship is a rich context in which to examine these social-cognitive processes, because it is long-term, affectively intense, and can be highly conflictual. At the same time, there are considerable individual differences in the quality and nature of sibling relationships, such that perceptions of one's sibling in childhood can range from cherished friend to mortal enemy. Various studies have examined the above self-serving biases in siblings' recollections of previous conflicts (McGuire, Manke, Eftekhari, & Dunn, 2000; Ross, Smith, Spielmacher, & Recchia, 2004; Wilson, Smith, Ross, & Ross, 2004). Typically, these biases in recall consist of selective omissions of one's own negative transgressions. Children tend to report only their sibling's real transgressions to parents and do not resort to fabricating false accusations (Ross & Den Bak-Lammers, 1998). Wilson et al. (2004) also showed that these biases seem to become more sophisticated with age. While younger children tend to deny their own negative transgressions, older children are more likely to spontaneously justify them. Ross et al. (2004) replicated this finding, and their results also suggested that self-presentational effects have at least a partial role to play in children's biased recall. This is plausible, because research has shown that even young children are very capable of managing impressions by deceiving others (Dunn & Munn, 1985) and tattling on their siblings (den

Bak & Ross, 1996). Characteristics of siblings' biased recall will be discussed in greater detail shortly, but suffice to say that the existence of these biases has been well-established in the literature.

On the other hand, past research in this area has not yet determined which factors might lead to individual differences in children's tendency to recall conflicts in a biased way. Although research suggests that there are age differences in the nature of these biases, it is less evident how children within each age cohort differ from one another. As alluded to above, understanding of others' internal states may be one factor predicting the magnitude of children's self-serving biases. That is, if children are better able to perceive the world from various points of view, to understand the motivations and emotions that guide action, and to realize that people can have dissimilar beliefs, then they may be more likely to encode, remember, and/or report a more balanced version of past events.

The manner in which children learn to use internal state terms in their early conversations with their families is arguably an important source for their knowledge about the internal world. Social constructivist theory (Carpendale & Lewis, 2004; Turnbull & Carpendale, 1999) postulates that children come to learn the meaning of mental state terms through their use in social interaction. In this context, children learn that others sometimes have different perspectives (Harris, 1996), and input from others can help to broaden their understanding of particular internal state terms (Carpendale & Lewis, 2004). Thus, children's habitual thinking about the meaning of internal states may be guided by internalized information gleaned from conversations with more skilled partners (see Rogoff, 1990). For example, Sabbagh and Callanan (1998) showed that mothers tend to respond to children's ambiguous utterances (e.g., "I don't know") as

though they refer to true mental states. Whether or not young children initially understand the metarepresentational underpinnings of these words, their use of the phrases provides opportunities for mothers to respond in informative ways.

There is some evidence that mothers' earlier use of internal state terms predicts children's later false belief understanding (Bartsch & Wellman, 1995; Brown, Donelan-McCall, & Dunn, 1996; Furrow, Moore, Davidge, & Chiasson, 1992). In addition, Jenkins, Turrell, Kogushi, Lollis, and Ross (2003) showed that other family members' internal state talk was a unique predictor of children's later mental state talk after both general language ability and the child's earlier mental state talk were controlled. Thus, their data support a socialization hypothesis, in that children's exposure to their family's talk about internal states predicts changes in their own use of these terms over time.

On the other hand, others have argued that the relationship between social interaction and understanding of mind is perhaps somewhat more complicated. For instance, Welch-Ross (1997; 2001) argues that social cognitive skill is a necessary condition in order for children to engage in (and thus benefit from) parent-child conversations involving multiple perspectives. In her research on autobiographical memory, she has shown that a more sophisticated theory of mind relates to greater recall of information from parent-child conversations after age and language are controlled (Welch-Ross, 1997). She argues that understanding both the relationship between experience and knowledge and of potentially conflicting mental representations are necessary prerequisites in order for children to enrich their comprehension of past events via their conversations with others. The former is important for children to be able to connect new knowledge to their own life history and to distinguish it from generic

knowledge about the world. The latter is necessary for children to develop shared understandings with others, by incorporating knowledge about the other's perspective with one's own experience. Thus, these bodies of research taken together suggest that the relationship between theory of mind and interaction may be bi-directional and transactive.

Although research is beginning to establish a clear link between internal state understanding and family interaction, it is less obvious how parent-child talk about internal states might contribute to a more balanced representation of past events in children's memory. Although this question has not been addressed directly, past research on the relationship between family interaction and autobiographical memory can shed some light on this issue. It has been shown repeatedly that parent-child conversations about the past influence children's subsequent recall of these earlier experiences. For instance, Fivush (1991) found that mothers' use of narrative structure (referential, orienting, and evaluative information) with their preschoolers predicted children's ability to tell unscaffolded narratives to interviewers one year later. Evaluative information is most relevant to the present investigation, since internal responses to events are encapsulated by this category, and are used to mark particular parts of the events as most salient or meaningful (Bruner, 1990). Haden, Haine, and Fivush (1997) found that maternal use of these evaluative statements when their children were 40 months of age was a unique predictor of their children's use of evaluative statements (with interviewers) at 70 months of age. Thus, the relationship between particular aspects of narrative structure and children's use of these various categories in recall seems to be specific (see

also Peterson & McCabe, 1994). That is, the particular type of information that mothers use most frequently is also the type that is focused on by their preschoolers.

This research suggests that the content of children's recall of life events is guided by their past conversations with parents. In helping their children to identify which aspects of their experiences are most important and meaningful, mothers model an effective way for children to access and recall their previous experiences. Following from this logic, if mothers fail to include information about others' perspectives into their talk with their preschoolers, this could have repercussions for the type of information that children see fit to include in their representations and subsequent narratives about past events. It is relatively easy for a child to represent his or her own experiences in memory, and to focus on his or her own goals and emotions. However, it is quite another issue for children to also encode and recall information about their sibling's point of view. When mothers and their children frequently include information about others' internal states in their conversations, children may be more likely to attend to this information on their own. Put another way, if mothers construe others' perspectives as relevant and important, children may be more likely to also treat them as such. The content of children's memories is influenced by what makes sense to them and what they want to remember (Stein, Trabasso, & Liwag, 1994). Thus, mother-child conversation about others' internal states may provide children with the knowledge and motivation necessary to attend to their siblings' perspectives and encode a more balanced view of past events.

The goal of the current study was to address the above questions. Specifically, an existing longitudinal data set was used to investigate the relationship between children's performance on various social-cognitive measures, their mothers' talk regarding internal

states in conversation and their own talk about internal states. Data for all of these measures were collected when the focal child was between 3 and 4 years of age. Two years later, each child was interviewed concerning their relationship with their younger sibling; their responses on this measure were used to measure the magnitude and content of their self-serving biases. As such, the relationship between children's earlier social-cognitive skills and later biases in perceptions of the sibling relationship could be investigated. The role of maternal socialization of perspective-taking skill was also taken into account.

The following sections explain how the major variables in this study were operationalized. In addition, the hypothesized interrelationships between measures of social-cognitive skill, maternal socialization of internal state language, and children's own use of this language are identified. Finally, the predictive relationships between internal state conversations and self-serving biases, as well as between social-cognitive skills and biases, are outlined in greater detail.

Children's Social-Cognitive Skills

Three measures of social-cognitive skill were administered to each child. These tasks assessed children's understanding of the relationship between perceptual access and knowledge (Marvin, Greenberg, & Mossler, 1976), their ability to make behavioural inferences from knowledge about internal states (Greenberg, Marvin, & Mossler, 1977), and their perceptual, cognitive, and affective perspective-taking skills (Abrahams, 1979). Although these three abilities are clearly related, they are not identical, and thus were not expected to correlate in exactly the same ways with the other measured variables in this study. All three social-cognitive abilities were expected to relate positively to age.

However, with age controlled, these skills could contribute to children's ability to participate in conversations about internal states with mothers and/or directly to their ability to maintain a balanced perspective on past events.

In the first case, relatively sophisticated social-cognitive abilities may make an important contribution to children's understanding of, and thus ability to communicate about, others' internal states. Welch-Ross (1997) argues that both an understanding of the link between knowledge and experience and an understanding of conflicting mental representations are important cognitive tools necessary to support learning about one's past. Understanding connections between knowledge and experience is relevant because it allows children to connect the content of their conversations with their actual experiences (Perner, 1990). In support of this notion, children's earliest autobiographical memories emerge at the same age as their ability to understand this connection (i.e., the age of 3; Taylor, 1988) and, more importantly, this ability is correlated with free recall of past events (Perner, 1992, as cited by Welch-Ross, 1995). Similarly, to understand that mothers' talk about internal states stems directly from true experience, children must be aware that their mother's knowledge is rooted in behavioural observations or subjective events (Welch-Ross, 2001). Understanding of conflicting mental representations encompasses the recognition that others may have valid perspectives that are dissimilar from one's own. This understanding may also be a necessary condition for learning from internal state conversations, since children must realize that mothers may have unique experiences that can be plausibly coordinated with their own (Reese, 2002). Thus, it was hypothesized that children's perspective-taking abilities and ability to link seeing and knowledge would each predict children's talk about internal states, albeit to different

degrees. Specifically, perspective-taking skills may be especially important for participating in family conversations about internal states, given the requirement to coordinate multiple perspectives. Understanding the link between seeing and knowledge may be somewhat less critical, although still relevant. Thus, we hypothesized relationships between perspective-taking skills and the quantity and quality (i.e., other-oriented content and function of internal state language) of children's talk about internal states. In contrast, we hypothesized that the other two measured social-cognitive skills would be less consistently associated with the frequency and nature of children's internal state language.

In addition, perspective-taking skills are clearly important for attending to and understanding the point of view of one's sibling in shared events. Without the ability to put themselves in another's shoes (perceptually, mentally, and emotionally), it would be more difficult for children to reflect on and incorporate their siblings' perspectives into their memories of previous experiences (Welch-Ross, 1997). In the same vein, being able to link internal states and behaviour is also critical for understanding another's actions. If children cannot reflect on the internal causes of others' behavior, the sophistication with which they can interpret their siblings' actions is limited. Regardless of whether they are aware of their siblings' preferences, goals, and emotions, they will be unable to use this information to understand behaviour unless they can establish a causal link between internal characteristics and visible actions. Thus, individual differences in both of these skills could be causally related to self-serving biases, such that a greater ability to infer behaviour from internal states and more sophisticated perspective-taking skills should lead to a decrease in the magnitude of self-serving biases. Again, it was hypothesized that

the link between perspective-taking and self-serving bias would be relatively stronger than the relationship between inferential ability and bias, given the direct relevance of perspective-taking to children's understanding of contrasting points of view.

Parent-Child Talk about Internal States

The second critical predictor variable in this study was maternal socialization of internal state talk and the child's corresponding talk about goals, emotions, traits, and beliefs. To examine this mother-child communication in a naturalistic context, families were observed over two 40-minute sessions interacting in their homes. For the purposes of the present study, various aspects of talk about internal states were coded. First, each maternal and child reference to internal states was identified and categorized by type (goal, belief, emotion, or personality trait). This allowed us to determine whether specific categories of talk were related differently to other critical variables in this study. For instance, various researchers have argued that it is the emotional evaluation of an event that gives it personal meaning (Bruner, 1990; Fivush & Kuebli, 1997) and aids later recall (Welch-Ross, Fasig, & Farrar, 1999). Thus, talk about emotions may be most important in developing an understanding of others' perspectives. On the other hand, the relationship between internal state talk and self-serving bias in recall may be nonspecific, such that all types of internal state references are equally predictive of a decrease in the magnitude of bias. This second possibility may be the most likely, as the sheer volume of information about the other's perspective may be the critical factor in developing a more balanced view of events.

In addition, it was hypothesized that although mothers' and children's general amount of talk about internal states would be related, the links between mothers' and

children's talk about corresponding categories of internal states would be strongest. For example, it was predicted that mothers' talk about beliefs would be a stronger predictor of children's talk about beliefs than children's talk about the other categories of internal states. This hypothesis stemmed from past research suggesting that the content of children's talk is structured by their mothers' particular focus in conversation (e.g., Haden et al., 1997).

Following this initial step, various theoretically and empirically derived measures of the content, sophistication, and function of internal state language were coded. For both mothers' and children's internal state references, coders identified the target and referent of speech. The target of speech was noted to eliminate any talk directed to parties other than the mother, the focal child, or the baby, and also to differentiate between talk directed to these three targets. Although no specific hypotheses were made regarding the relationship between target of speech and bias, it is likely that children speak differently to their mothers and siblings, and as such their internal state references to their mothers and siblings might correlate differently with bias. Similarly, mothers' talk about internal states to the child him/herself versus the baby may have different implications for the child. Thus, target of internal state language was included for exploratory purposes.

The referent of the utterance was a critical category, because it distinguished between mothers' and children's talk about their own internal states and talk pertaining to the perspective of another. This category could also be used to examine the frequency of talk about the sibling's internal states specifically. In this data set, but using an earlier internal state language coding system, Howe (1991) found that children's references to their siblings' internal states were specifically associated with their perspective-taking

skills. In addition, Howe and Ross (1990) found that maternal speech to children about their siblings was associated with children's positive sibling-directed behaviour. These findings suggest that family members' other-oriented references to internal states may be associated with the nature of the sibling relationship as well as children's social-cognitive skills. As such, we hypothesized that mothers' and children's references specifically referring to the internal states of others would be selectively predictive of decreases in children's later self-serving biases. In contrast, family members' internal state talk in general may not be as strongly related to later self-serving biases.

The causal connectedness and pragmatic function of children's references to internal states were also identified. Causal connectedness (i.e., provision of justifications for claims) has been examined in other contexts, and has been found to predict children's later false belief understanding and perspective-taking skill (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). In addition, organizing narratives in a causal (rather than simply temporal) sequence has been shown to improve the accuracy and comprehensiveness of recall (Trabasso & Van den Broek, 1985). Thus, being able to causally link others' behaviour and internal states may aid children in both their ability to perspective-take and to recall past experiences accurately. As such, it was hypothesized that children who were more likely to causally connect their references to other statements would have more sophisticated concurrent social-cognitive skills, and also be less biased in their recall two years later.

The pragmatic function of children's references to internal states may be indicative of their specific motivation for taking the other's perspective, and also of their social-cognitive sophistication. Even if children were referring frequently to others'

internal states, they may be doing so for the purpose of achieving their own immediate goals at the expense of the other (e.g., “You want it, but it’s mine.”). Alternatively, they may be referring to these states to truly try to understand and take into account the perspective of the other (“Do you want the green or the red one?”). Finally, they may simply be using these terms conversationally, for no straightforward instrumental purpose (“He loves it when we visit grandma.”). Clearly, these different uses of internal state talk may have different implications for the amount of self-serving bias in perceptions of the sibling relationship. Children who refer to others’ internal states for their own exclusive benefit may exhibit greater self-serving bias than children who use these references conversationally, or for the benefit of others as well as themselves. Past research has focused on developmental changes in the pragmatic use of mental state references, whereas the impact of individual differences in the conversational function of internal state references on children’s perceptions has not yet been established. Past research suggests that the function of these references becomes less self-interested as children become older (Brown & Dunn, 1991; Hughes & Dunn, 1998). Dunn (1994) has also shown a developmental increase in the number of causal references made for conversational or pretense purposes as opposed to self-interested purposes. Although these findings suggest interesting developmental differences, it remains to be seen how these pragmatic uses will differentially predict self-serving biases.

Finally, maternal responses to children’s internal state references were also investigated. As described above, Sabbagh and Callanan’s (1998) found that informative parental responses can lead to greater use of internal state talk in children. Thus, to the extent that mothers respond supportively to children’s internal state talk, this may

selectively reinforce children's consideration and use of this information. Mother's responses were coded as supporting or acknowledging children's references, opposing or disagreeing with them, or ignoring them altogether. Both supporting and opposing may have positive outcomes on children's understanding. Supportive mothers may provide an encouraging context for children to learn about internal states, and oppositional mothers may aid children in understanding conflicting mental representations and may challenge them to consider the accuracy of their statements (e.g., "You think I like chocolate, but I really don't."). However, mothers who ignore their child's internal state references do not provide reinforcement of any kind, and may have children with a less sophisticated understanding of internal states. We hypothesized that children whose mothers were supportive or oppositional would exhibit fewer biases in their later recall than children whose mothers ignored their internal state references. Particularly, a great deal of opposition by the mother may be especially helpful in teaching children about conflicting representations, and as such, the strongest relationship was expected between this type of response and children's later self-serving biases. In addition, we predicted positive relationships between supportive and oppositional responses and children's social-cognitive skills, due to the potentially didactic nature of both types of responses.

Children's Self-Serving Biases

Self-serving biases can manifest themselves in various ways, from the very blatant to the relatively subtle. Perhaps the most obvious form of self-serving bias is the "he did it", "she did it" phenomenon of selectively blaming the other. Indeed, past research on sibling conflict has established that siblings are much more likely to blame their antagonists for starting fights than themselves (McGuire et al., 2000). The same

researchers found that, in general, both children tended to agree that older siblings usually won fights. In the present study, children were asked to nominate which sibling usually started, and which sibling usually won their fights. Because only older siblings participated in the present study, they would be expected to indicate that they usually won their fights. Nevertheless, the degree to which they made these claims might also be related to individual differences in their self-serving biases. Also, greater bias is reflected in children's tendency to claim that their sibling usually started their fights.

In addition, Wilson et al. (2004) found that children, in describing previous conflicts, reported more negative actions by their siblings than by themselves. However, in the same study, siblings did not report differences in the number of positive actions of self and other. Note that children could be either inventing positive actions of the self and negative actions of the sibling (errors of commission) or selectively omitting negative actions of the self and positive actions of the sibling (errors of omission). Wilson et al. (2004) were not able to differentiate between these two possibilities. However, Ross et al. (2004) were able to address this question. They found that, with regards to siblings' reports of positive actions, children demonstrated both errors of omission (selectively overlooking their siblings' real positive actions) and errors of commission (inventing positive actions of the self). For negative actions, children selectively omitted their own transgressions from their narratives. However, neither sibling went so far as to invent negative actions of the other. In the present study, we were not able to differentiate between errors of omission and commission. However, we examined both enhancement of own positive actions in relation to other, and disparagement of the sibling via selective recall of the other's negative actions. Based on previous research, biases of both types

were expected, but particularly disparagement of sibling, since past findings on enhancement of self are mixed. That is, Ross et al. (2004) found biases with regards to positive actions of self and other, whereas Wilson et al. (2004) did not.

Past research also suggests developmental differences in the sophistication of self-serving biases. Both Wilson et al. (2004) and Ross et al. (2004) found that younger siblings (3- to 5-year-olds) tended to deny their own negative actions, whereas older siblings (5- to 9-year-olds) justified them. It is unclear from the previous research whether this is an age or birth order effect, but both sets of researchers interpreted it as the former. As such, we hypothesized that children's self-serving biases would become more sophisticated with age, although effects might be attenuated by the narrow age range of children in this study. We also predicted that there would be individual differences in the sophistication of self-serving biases among older siblings after controlling for age and that these differences would be associated with children's social-cognitive skills. Because justifying one's actions requires greater cognitive sophistication than denying them, social-cognitive abilities may predict the tendency to do so. In addition, the frequencies of justifications for one's own actions as compared to the sibling's actions were examined. A greater number of justifications for own actions relative to the sibling's actions were inferred to reflect greater bias. It makes intuitive sense that this measure could be related to perspective-taking skills and inferential abilities; an inability to step into the other's shoes and reason about the causes of their behaviour would reduce children's capacity to justify their actions given that this is one important means to gain insight into another's point of view.

The Present Study: Overview of Predictions

To summarize, the current study examined the relationships between children's social-cognitive abilities, the nature of internal state conversations between mothers and children, and children's self-serving biases in perceptions of the sibling relationship. Although one goal was to replicate previous findings regarding children's self-serving biases in recall, the major purpose of the study was to determine the social-cognitive and family interaction variables that best predicted children's self-serving biases. In addition, we examined the interplay between children's social-cognitive skills and family talk about internal states to determine how these variables are related. Hypotheses are summarized below.

Social-cognitive ability and internal state language. This study examined how mothers' talk about internal states might be associated with children's own use of this language. Specifically, it was predicted that mothers' use of internal state language and responsiveness to their children's internal state language would be related to children's own use of internal state language. We also predicted that the relationships between maternal and child internal state language would be specific, rather than general. To the extent that mothers supported consideration of others' internal states, it was predicted that children's talk would have an other-oriented function and would also refer to others' internal states. In addition, it was hypothesized that children's social-cognitive abilities (inferences from internal state information, an understanding of the relationship between seeing and knowledge, and perspective-taking skills) would be related to the frequency and nature of children's talk about internal states with mothers. Although social-cognitive abilities are evidently related to children's age and language abilities, it was nevertheless expected that the above relationships would persist after these variables were controlled.

Specifically, children with more sophisticated social-cognitive abilities were predicted to be more other-oriented in the content and function of their internal state language, as well as more likely to discuss internal states in a causally connected manner.

Social-cognitive ability and bias. It was predicted that children's social-cognitive skill would be associated with a decrease in the magnitude of their self-serving biases (less enhancement of self, denigration of other, attributions of other's fault, claims of own winning, and selective use of justification for self) and simultaneously a greater sophistication in the use of these biases (more justifications for own actions, less use of denial). Although scores on the three measures of social-cognitive ability are likely to be related, it was also expected that they would be differentially predictive of the other variables of interest. In particular, an especially strong relationship was predicted between perspective-taking skills, children's talk about internal states, and their self-serving biases. We hypothesized that children's ability to understand the link between seeing and knowledge may be somewhat less important, followed by their ability to make behavioural inferences from internal state information.

Family talk about internal states and bias. The final goal of this study was to determine how mothers' and children's internal state language might be associated with children's later self-serving biases. Given that children's talk about internal states constitutes a more socially embedded measure of children's social-cognitive abilities, it was predicted that internal state language would be a stronger negative predictor of self-serving bias than children's comparatively decontextualized performance on measures of social-cognitive ability. That is, children's actual use of internal state information in conversations with other might be a better predictor of their later self-serving biases than

their hypothetical abilities tested in a lab setting. More specifically, it was predicted that children's other-oriented use and content of internal state references, as well as their mention of causal relationships between mental states and behaviour, would be associated with decreased bias in perceptions of the sibling relationship. In addition, maternal talk about internal states was also expected to be associated with children's self-serving biases, albeit to a lesser degree, given the indirect nature of the relationship.

Method

Participants

The initial sample consisted of 32 pairs of siblings and their mothers from a mid-sized community in southwestern Ontario. In all cases, the younger sibling was 14 months of age (+/- 2 weeks). The mean of older siblings' ages was 3.9 years ($SD = 6.8$ months, range = 3.0 to 4.8 years). The sample was balanced for gender, and included equal numbers of all possible dyadic gender compositions. Families were identified through birth announcements in the local newspaper.

Approximately two years after their initial participation in the study, 26 families took part in a second session (81% of original sample). At the time of this follow-up session, older siblings were, on average, 6.2 years of age ($SD = 6.8$ months, range = 5.3 to 7.1 years), and younger siblings were approximately 3.5 years of age ($SD = 1.6$ months, range = 3.2 to 3.8 years).

Procedure

Data for this study were taken from a larger project examining sibling relationships and family interaction. Only measures relevant to the present investigation will be described below.

Time 1 (T1). Each family participated in three sessions over a 2-week period. Two observation sessions were conducted at the participants' homes. During each session, naturalistic exchanges between family members were audiotaped, and an observer coded both mothers' and children's behaviour (these observations are not relevant to the present investigation, except to clarify that an observer was present during the interaction). Each session lasted 40 minutes and was preceded by a 15-30 minute warm-up period. All participants were instructed to ignore the observer and mothers were asked to engage in normal daily routines. The third session was conducted at a university laboratory. At this time, the older children individually completed a battery of social-cognitive measures administered privately by an experimenter.

Time 2 (T2). Two years after the initial session, older siblings participated in a second session at their homes, during which they were interviewed privately about their relationship with their younger sibling.

Measures of Social-Cognitive Ability (T1)

Three measures assessing various aspects of social understanding and perspective-taking skill were administered in counterbalanced order.

Secret game. This task assessed whether children are able to recognize that one must have perceptual access to an event in order to have knowledge of it, and was first developed by Marvin et al. (1976). Two people shared a secret (selecting one of two toys) while a third hid his/her eyes. The three players included the participating child and two experimenters. A secret was shared between two players a total of 12 times. On six of these trials the child was privy to the secret, and on the other six, the secret was shared between the two experimenters. After each trial, the child was asked to identify whether

each player “knew the secret”. To score a point for that trial, the child had to correctly identify the knowledge state of all three players. Thus, the maximum possible score for this measure was 12 points. Two independent raters coded 25% of the data (responses for 8/32 children) as correct or incorrect. Inter-rater agreement was high ($kappa = 1.0$). In addition, the internal consistency of this scale was excellent (Cronbach’s $alpha = .97$).

Syllogisms. This task (developed by Greenberg et al., 1977) assessed children’s abilities to make logical inferences about behaviour based on a character’s dispositions. For example, children would be told that “Sarah doesn’t like to get wet,” and then asked “Would she rather play in a puddle or read a book?” Children were also asked to justify each of their responses. The scale consisted of four items, and an additional fifth item in which an illogical choice was presented (“May is really hungry, would she rather play with blocks or ride a bike?”). A total score of 10 was based on the number of correct responses to the logical choice questions (4 points), the number of reasonable justifications for these responses (4 points), the ability to identify that neither option was plausible for the illogical choice question (1 point), and an increased latency to respond to the illogical choice question (1 point). This final point was based on the argument that children capable of inferential reasoning should be surprised by the final question and thus take longer to respond (Greenberg et al., 1977). Two independent raters coded 25% of the data (8/32 children), and inter-rater agreement for this scale was high ($kappa = .98$). Internal consistency reliability for this scale was also good (Cronbach’s $alpha = .88$).

Bear game. The final perspective-taking task, developed by Abrahams (1979), measured various aspects of children’s perspective-taking ability. Specifically, this

measure was designed to assess perceptual, cognitive, and affective perspective-taking skills. It consisted of a three-dimensional array including a bear, dog, and boy. In the display, the boy was running after his dog around a hedge while being chased by a bear. To the child, the bear appeared to be chasing the boy and his dog. However, from a confederate's perspective, the hedge concealed the bear, and thus the boy and dog appeared to be playing.

Each child was first given the opportunity to examine the display from the confederate's perspective, and then moved to his/her own chair and answered nine questions. Half of these items assessed children's understanding of their own perspectives, and half of the items assessed children's ability to put themselves in the shoes of the confederate (Shari). The first question prompted the child to describe the scene from his/her own perspective ("What do you think is going on in this scene? Why do you think the boy is running?"), and the next two questions prompted the child to describe the scene from the confederate's perspective ("What does Shari see?" and "What does Shari think is going on in the scene? Why does Shari think the boy is running?"). The remaining six questions assessed perceptual perspective-taking ("What do you/does Shari think the boy sees?"), cognitive perspective-taking ("What do you/does Shari think the boy thinks?"), and affective perspective-taking ("How do you/does Shari think the boy feels?") skills. Children's responses to each question were coded as correct (1 point) or incorrect (0 points). The maximum possible score was 9 points. Two independent raters coded 25% of the data (responses for 8/32 children), $kappa = .91$. As might be expected given the multi-dimensional nature of this scale, internal consistency reliability

for children's overall scores was somewhat lower than for the other two social-cognitive measures (Cronbach's $\alpha = .66$).

Home Observations (T1)

To establish reliability for all coding, two independent raters coded 25% of the data (16/64 transcripts). Cohen's κ s are reported below.

All conversations between family members were transcribed, and utterances were parsed into individual units of meaning (typically one subject-verb group). The older siblings' and mothers' references to internal states were identified and coded as one of five broad types: Emotions, Mental States, Goals, Preferences or Traits (see Appendix A for details). This coding scheme was based loosely on those used previously to address related research questions (e.g., Howe, 1991; Jenkins et al., 2003; Welch-Ross et al., 1999). When necessary, a unit was coded more than once (e.g. "I *think* you're *happy*"). However, self-vocalizations and utterances directed at the observer or other targets (e.g., pets, father) were not coded. In addition, children's references to internal states that resulted entirely from leading by their mother (e.g., M: "You were happy, right?" C: "Yes, I was happy") were excluded from all analyses (161 of 1835 total child references). Percent agreement for initial identification of lines to be coded was calculated as $\text{agreements}/(\text{agreements} + \text{disagreements})$; Inter-rater agreement was 88%. κ for internal state category was .98.

Following this initial step, each internal state reference was coded in various ways; see Appendix B for a detailed description of the coding scheme. Coders identified the speaker, conversational target (mother, older sibling, baby or some combination of these) and referent (who the reference is about; $\kappa = .96$) for both mothers' and

children's references. In addition, children's references were coded for function (inferred pragmatic-conversational goal of the speaker; $kappa = .84$), and causal connectedness (whether internal states were used as justifications, justified in their own right, or neither; $kappa = .74$). Mothers' responses to each of their older child's internal state references were also identified and coded as supporting, opposing, or ignoring the reference ($kappa = .84$).

Finally, a measure of MLU for the older child was calculated based on the number of morphemes used in a sample of their utterances (usually 100 sentences/observation session¹). For example, the sentence "I jumped on Bob's truck" contains seven morphemes (each word consists of one morpheme except jump-ed and Bob-s, which each consist of two). The specific rules used were developed by Brown (1973), and take into account the meaning that words are inferred to hold for children (e.g., "birthday" consists of one morpheme, rather than two). The correlation between the judgments of utterance length for two independent raters was $r = .99, p < .001$.

Measures of Self-Serving Bias (T2)

The sibling interview was used to measure children's self-serving biases in perceptions of the sibling relationship. It was a modification of a semi-structured interview developed by Stocker, Dunn, and Plomin (1989), and was designed to assess children's perceptions of various aspects of their sibling relationship. It included both open- and closed-ended questions. The modified version consisted of 21 questions in total, although not all questions were relevant to the present study (questions pertaining to pretend play, caretaking, and differential parenting were excluded). For the purpose of assessing self-serving biases, responses to open-ended and closed-ended questions were

coded separately. To assess inter-rater reliability, two independent raters coded 26% of the data (7/26 transcripts), and Cohen's *kappas* are reported below.

Open-ended questions. Children were first asked to provide specific evaluations of their sibling's positive and negative qualities ("What is it that you really like about your brother/sister? That you think is really neat?" and "What is it that you really don't like about your brother/sister? That really bugs you?"). In addition, they were asked to describe a recent conflict that they had with their sibling ("Can you tell me about a fight that you had recently?") and about both siblings' willingness to share their toys (e.g., "How do you feel about sharing your toys with your brother/sister? Are there some things you would rather not share? Like what?"). At the end of each interview, children were also invited to add any other comments about their sibling ("Is there anything else you want to tell me about your brother/sister?"). A standard prompt was used for each question ("Tell me more.").

Children's responses were parsed into units of meaning (in the same manner as the observational transcripts), and the frequencies of various types of references were tabulated. Coders made an initial pass through each transcript to identify whether a line was evaluative or descriptive (*kappa* = .83). When a response was coded as evaluative, it was coded for referent (self or sibling; *kappa* = .99), and valence (positive or negative; *kappa* = .94). Statements related to conflict, control, competition or negative emotions were defined as negative. Statements related to prosocial behaviour, cooperation, play, and positive emotion were defined as positive. Finally, each evaluative statement was also coded as justified or unjustified (*kappa* = .84). For example, a child might describe hitting his/her sibling, but claim that his/her negative action was justified by his/her

sibling's earlier transgressions. This coding thus yielded eight distinct categories (i.e., positive self justified, positive self unjustified, negative other justified, etc.).

These scores were used to infer various aspects of self-serving bias. Enhancement of self was calculated by subtracting the number of positive references to sibling from the number of positive references to self. Similarly, denigration of other was scored by subtracting the number of negative references to self from the number of negative references to sibling. Finally the difference between the number of justifications for self and other was used to tabulate selective justification of own actions. In general, a greater number of justifications for one's own behaviour would presumably reflect a more egocentric view of the world.

Closed-ended questions. Children were asked to answer two closed-ended questions about their conflicts with their sibling ("Who usually starts fights?" and "Who usually wins fights?"). Responses to each question were coded on a 3-point scale; *kappas* were both 1.0. For appraisals of which sibling usually starts fights, 1 = "usually self", 2 = "self and sibling equally", and 3 = "usually sibling". Attribution of winning fights used the same categories, but the scale was reversed (i.e., 1 = "usually sibling"). As such, in both cases, a higher score reflected greater bias.

Results

For all analyses, statistical significance was assessed using two-tailed tests. For correlational analyses and omnibus ANOVAs, the alpha level was set at $p = .05$. The Bonferroni correction was used for all post hoc tests.

Measures of Social-Cognitive Ability

Overall scores for the three measures of social-cognitive ability are reported in

Table 1.

Table 1

Scores on Measures of Social-Cognitive Ability

	Total Possible Score	<i>M</i> Score (<i>SD</i>)
Bear Game	9	4.55 (1.47)
Secret Game	12	5.38 (5.20)
Syllogisms	10	4.06 (3.30)

Age and language effects. For each of the three measures, children's scores increased with age. Specifically, correlations between child's T1 age and the bear game, syllogisms, and secret game scores were .64 ($p < .001$), .54 ($p < .001$), and .43 ($p = .01$), respectively. There was also a relationship between children's mean length of utterance and their syllogisms score ($r = .42$, $p = .02$) although this relationship was not significant with age controlled, $pr = .18$, *ns*.

Interrelationships between measures. Partial correlations (controlling for age) between each of the three measures of social-cognitive ability are reported in Table 2. With age controlled, only the relationship between syllogisms and the secret game was significant, although the relationship between the bear game and secret game approached significance. Thus, as hypothesized, the three social-cognitive measures appeared to be measuring relatively distinct abilities.

Table 2

Partial Correlations between Measures of Social-Cognitive Ability (child age controlled)

Measure	Bear Game	Secret Game	Syllogisms
Bear Game	--	.34 ^t	.18
Secret Game		--	.52**
Syllogisms			--

^t $p < .10$ ** $p < .01$

References to Internal States During Family Interaction

Unless otherwise noted, all analyses involving references to internal states were computed using frequencies of references as a proportion of the total number of conversational turns for that actor. For example, a child making 10 references to internal states in 100 conversational turns would obtain a score of .10. As such, scores reflect family members' emphasis on internal states in conversation, rather than simply the overall frequency with which they discuss internal states². Overall means and standard deviations for each category of internal states are listed separately for mothers and children in Table 3.

Table 3

Internal State References as Proportions of Conversational Turns

Category	Child References	Maternal References
Belief	.04 (.03)	.07 (.04)
Emotion	.01 (.01)	.03 (.02)
Goal	.14 (.05)	.15 (.05)
Preference	.01 (.01)	.01 (.01)
Trait	.02 (.02)	.03 (.02)
Total	.22 (.09)	.30 (.10)

Stability across two weeks. Individual differences in both children's and mothers' proportions of references to internal states remained stable across two weeks. With age controlled, the proportion of children's references to internal states at the first observation was related to their proportion at the second observation ($pr = .48, p < .01$). With child age controlled, a similar pattern was found for the stability of mothers' references ($pr = .61, p < .001$). Given these associations, subsequent analyses were collapsed across the two observation sessions.

Age effects. As predicted, the proportion of children's references to internal states increased with age ($r = .50, p < .001$). Particularly, children's references to beliefs ($r = .45, p = .01$), traits ($r = .41, p = .02$) and emotions ($r = .36, p = .04$) increased with age. There was also a trend for children's references to goals to increase with age ($r = .31, p = .08$), but the proportion of talk about preferences was not related to age ($r = .04, ns$). With these associations in mind, subsequent analyses involving children's references to

internal states controlled for child's T1 age. On the other hand, mothers' references to internal states in general were not related to her child's age, nor was her use of any of the five specific types of internal state language (e.g., beliefs, goals; $r_s < .27$, $p_s > .14$).

The target and referent of children's internal state language were also related to child age. Older children talked more about internal states to both their mothers ($r = .39$, $p = .03$) and their younger siblings ($r = .37$, $p = .04$). However, given that these correlations were approximately equal, developmental increases in children's talk about internal states did not appear to be linked to a specific increase in talk to a particular target, but were instead more general in nature. As predicted, older children talked more about others' internal states than did younger children. Specifically, older children talked more *about* both their mothers ($r = .46$, $p = .01$) and younger siblings ($r = .41$, $p = .02$) as a proportion of total talk, although children's talk about themselves was not significantly related to age³ ($r = .05$, *ns*).

The function and causal connectedness of children's speech also differed as a function of their age. As predicted, older children tended to use internal state language in more varied ways than younger children. Although children's use of internal state language for self-oriented purposes was unrelated to age ($r = .01$, *ns*), older children were more likely to use internal state language for both expressive ($r = .48$, $p = .01$) and other-oriented ($r = .59$, $p < .001$) purposes. Somewhat unexpectedly, age was also positively related to children's use of causally disconnected internal state language ($r = .53$, $p = .01$). Children's use of internal states as reasons for other statements was not significantly related to age, although the relationship between age and the provision of reasons for internal states approached significance ($r = .30$, $p = .09$).

Finally, maternal responses to children's internal state language were related to the child's age. As children grew older, mothers were less likely to respond to children's talk about internal state language (i.e., more likely to *not* respond) ($r = .63, p < .001$). However, the frequencies of mothers' supporting or opposing responses were unrelated to children's ages ($r_s < .16, p_s > .37$).

Relationships between categories of internal state language. Correlations between the various categories of internal state language were calculated separately for children (Table 4; with child age controlled) and mothers (Table 5). The hypothesized positive relationships between categories of internal state language were partially supported. For children, their proportion of talk about traits was positively related to their talk about beliefs, preferences, and goals. In addition, children's talk about preferences and goals were significantly positively associated. Mothers who discussed beliefs more often also referred more often to goals, and mothers who talked about emotions were also more likely to discuss traits. In addition, a nonsignificant trend suggested a relationship between maternal talk about beliefs and traits⁴.

Table 4

Partial Correlations between Categories of Child Internal State Language (child age controlled)

Category	Belief	Emotion	Goal	Preference	Trait
Belief	--	.17	-.01	.09	.48**
Emotion		--	-.01	-.03	.17
Goal			--	.42*	.40*
Preference				--	.46**
Trait					--

* $p < .05$ ** $p < .01$

Table 5

Correlations between Categories of Maternal Internal State Language

Category	Belief	Emotion	Goal	Preference	Trait
Belief	--	.24	.56**	.25	.32 [†]
Emotion		--	.28	.01	.57**
Goal			--	.26	.11
Preference				--	-.03
Trait					--

[†] $p < .10$ ** $p < .01$

Relationships between mothers' and children's internal state language. With child age controlled, children's and mother's proportions of talk about internal states were related ($r = .39, p = .03$). Specific associations between mothers' and children's

references to the various internal state categories (beliefs, traits, preferences, goals, and emotions) are reported in Table 6. With child age controlled, mothers' and children's references to preferences and goals were significantly related. However, contrary to hypotheses, mothers' and children's corresponding references to beliefs, traits, and emotions were not significantly associated. Children's references to beliefs were associated with mothers' references to traits and emotions, their references to preferences were associated with mother's talk about traits, and their references to goals were associated with mother's talk about preferences.

Table 6

Partial Correlations between Categories of Child and Maternal Internal State Language (child age controlled)

Child IS Language	Maternal IS Language				
	Belief	Emotion	Goal	Preference	Trait
Belief	.13	.43*	.01	-.15	.36*
Emotion	-.26	-.14	-.18	-.01	-.15
Goal	.24	.25	.43*	.53**	.20
Preference	.18	.15	.29	.39*	.53**
Trait	.06	.08	.12	.09	.22

* $p < .05$ ** $p < .01$

Correspondence between the referent of mothers' and children's talk about internal states was also examined. With child age controlled, only the relationship between mother and child's talk about the child was significant ($r = .61, p < .001$).

Unexpectedly, neither mothers' and children's talk about the baby nor mothers' and children's talk about the mother were significantly associated ($prs < .18$, $ps > .35$).

Maternal responsiveness to children's internal state language. In order to examine the nature of mothers' responses to children's internal state language, repeated measures ANOVAs were used to calculate the two-way interactions between maternal response and the referent, function, and causal connectedness of children's talk.

Results revealed an interaction of referent (baby, child, or mother) and maternal response (support, ignore, or no response), $F(4, 28) = 8.72$, $p < .001$. Follow-up t -tests revealed that the pattern of maternal responses was unique for each referent (see Figure 1). Specifically, when children referred to their own internal states, mothers were more likely to support them than either ignore them or oppose them ($ts > 2.71$, $ps < .01$). When children referred to their mothers' internal states, moms were less likely to oppose them than to either support or ignore them ($ts > 3.01$, $ps < .01$). Finally, when children referred to their younger siblings' internal states, mothers were more likely to ignore them than to either oppose them or support them ($ts > 3.46$, $ps < .01$). Although this pattern for the baby seems somewhat surprising, an examination of the relationship between target and referent helps to clarify its meaning. On average, when children referred to the baby's internal states, 68% of the time they were talking directly to the baby, rather than to their mother. In contrast, 95% of children's references to their own internal states and 99% of children's references to their mothers' internal states were directed at their mothers. Under these circumstances, it makes good sense that mothers were unlikely to respond to references about the baby.

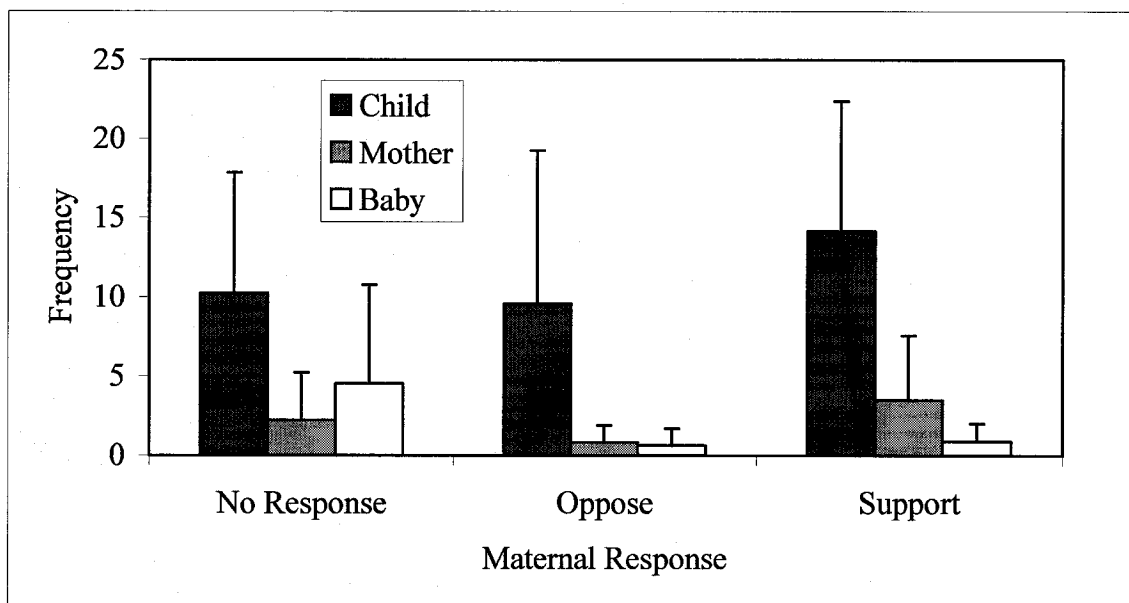


Figure 1. Relationship between referent of children's internal state talk and nature of maternal responses (+SD).

The interaction of function and maternal response was also significant, $F(4, 28) = 15.05, p < .001$. Follow-up t -tests revealed that the pattern of maternal responses was similar for expressive and other-oriented references to internal states, but different for self-oriented references (see Figure 2). Specifically, when children were using internal states for other-oriented or expressive purposes, mothers were less likely to oppose them than either support them or ignore them ($ts > 4.57, ps < .001$). However, when children were using internal states for self-oriented purposes, mothers were less likely to ignore them than they were to either oppose or support them (both $ts > 2.75, ps < .01$).

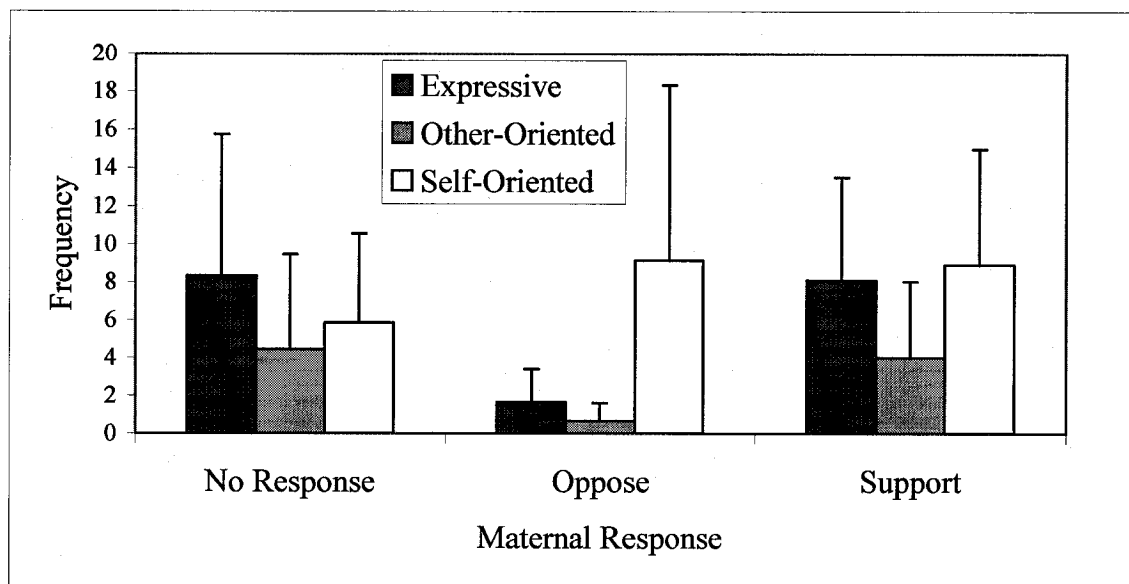


Figure 2. Relationship between function of children's internal state references and nature of maternal responses (+SD).

Finally, there was a significant interaction between the causal connectedness of children's internal state language and maternal response, $F(4, 28) = 21.31, p < .001$. The pattern of means suggested that mothers were particularly unlikely to oppose references that were not causally connected (see Figure 3). When internal state references were not causally connected, mothers were significantly less likely to oppose them than either support them, $t(31) = 6.95, p < .001$ or ignore them, $t(31) = 3.79, p < .01$. When internal state references were used as reasons or justified in their own right, mothers were equally likely to support, oppose, or ignore them ($ts < 1.81, ps > .29$).

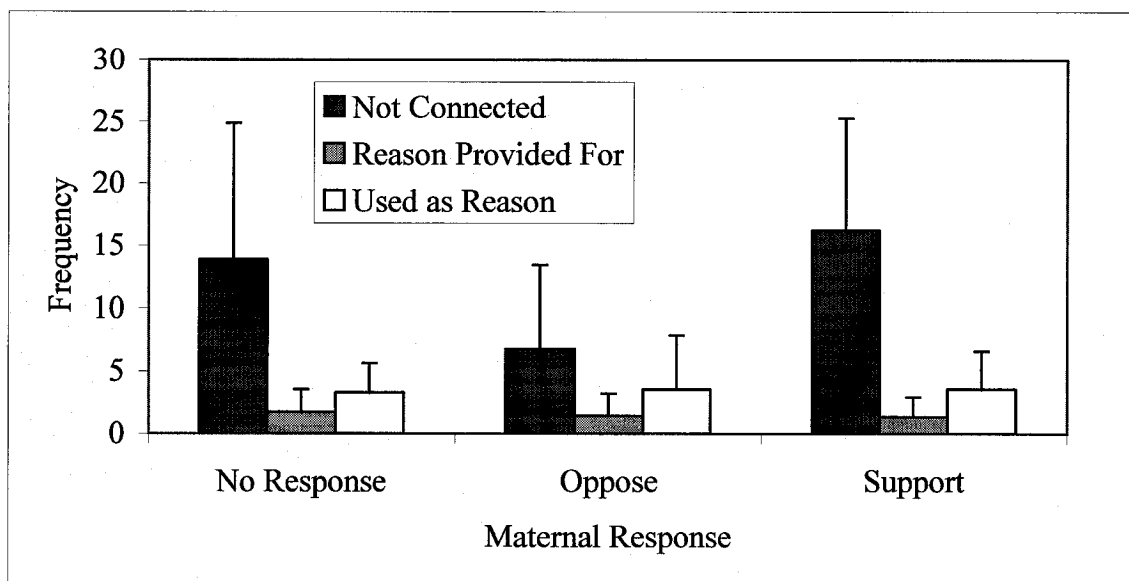


Figure 3. Relationship between causal connectedness of children's internal state references and nature of maternal responses (+SD).

Summary. The results of this study suggest a number of developmental changes in children's use of internal state language, as well as interesting individual differences between children with age and overall amount of talk controlled. Older preschoolers' use of internal state language was both more frequent and more other-oriented in function and content than that of younger preschoolers. With age controlled, children who discussed one category of internal states (e.g., beliefs) were also somewhat more likely to discuss other categories of this type of talk.

There were also a number of relationships between children's and mothers' talk about internal states. As predicted, if mothers talked more about internal states in general, children were also more likely to do so. However, when specific categories of internal state language were examined separately, the strongest associations were between children and mothers' talk about preferences, goals, and traits. Similarly, when talk was

categorized by referent, only the association between mothers' and children's talk about the child him/herself was significant. Finally, the referent, function and causal connectedness of children's references to internal states were related to the nature of their mothers' responses.

Relationships between Social-Cognitive Ability and Family Talk about Internal States

Partial correlations (with child's T1 age controlled) were computed between family talk about internal states and children's scores on the three measures of social-cognitive ability (bear game, secret game, and syllogisms).

Social-cognitive ability and categories of internal state language. Contrary to predictions, none of the three partial correlations between children's scores on the measures of social-cognitive ability and their overall proportion of internal state language were significant, (pr s < .14, ps > .46). When specific categories of internal state language were examined separately, only the relationship between children's talk about emotions and their score on the bear game was significant (i.e., 1 of 15 relationships; $pr = .39$, $p = .03$). Similarly, with age controlled, none of the children's scores on measures of social-cognitive ability were significantly related to mother's overall proportion of talk about internal states (pr s < .11, ps > .56). However, children's score on the secret game was positively related to mothers' talk about beliefs ($pr = .36$, $p = .05$), and negatively related to her talk about emotions ($pr = -.39$, $p = .03$).

Social-cognitive ability, referent, and target of internal state language. Children's scores on the measures of social-cognitive ability were not significantly related to either the referent or the target of their internal state language. The only relationship that approached significance was between the proportion of the child's talk to the baby and

his/her score on the bear game ($pr = .32, p = .09$). Similarly, children's scores on the measures of social-cognitive ability were not related to the target or referent of their mothers' references to internal states. In this case, the only relationship that approached significance was mother's talk about herself and the child's score on the secret game ($pr = .32, p = .09$).

Function and causal connectedness of internal state language and social-cognitive ability. None of the partial correlations (with age controlled) between the three functions of internal state language and children's social-cognitive ability scores were significant ($prs < .25, ps > .17$). When partial correlations between the three causal connectedness categories and children's social-cognitive scores were computed, the only significant relationship was between children's score on the bear game and their provision of reasons for internal states ($pr = .35, p = .05$).

Social-cognitive ability and maternal responses to children's internal state language. None of the partial correlations (with child age controlled) between measures of social-cognitive ability and the three categories of maternal responses to the child's internal state references approached significance ($prs < .24, ps > .18$).

Summary. Contrary to hypotheses, children's scores on the measures of social-cognitive ability were not strongly related to their talk about internal states with age controlled. However, there were a few interesting correlations between scores on the bear game and various aspects of children's talk. Specifically, children's scores on the bear game were related to their talk about emotions, the amount of internal state language they directed to the baby, and the degree to which they provided reasons for their internal states. Maternal talk about internal states was also not strongly related to children's scores

on measures of social-cognitive ability. However, the associations that did emerge were exclusively with regards to children's scores on the secret game. Mothers of children who scored higher on the secret game were more likely to talk about beliefs, less likely to discuss emotions, and more likely to talk about themselves.

Self-Serving Biases in Children's Recall of Sibling Interactions

Age effects. Child's T2 age was not significantly related to children's perceptions of starting or winning fights ($r_s < .08, p_s > .70$). To assess age effects on open-ended measures of bias, scores were computed as proportions of total talk during the sibling interview (to control for children's overall verbosity). Speech clauses (comprised of one subject and verb) were the unit of analysis used to compute amount of talk. Children's ages were not significantly related to any of the open-ended measures of self-serving bias (enhancement of self, denigration of other, selective justification of own actions) ($r_s < .10, p_s > .64$). As such, the predicted increase in sophistication of self-serving biases with age was not supported. Given the lack of significant age effects, children's ages at the second time point of the study were not included in any subsequent analyses.

Perceptions of starting and winning fights. Chi-square tests revealed that children demonstrated self-serving biases for both their perception of who starts sibling conflicts, $\chi^2(2) = 12.25, p = .01$, and who wins them, $\chi^2(2) = 22.14, p < .001$. For perceptions of starting fights, children were less likely than expected to claim that they themselves started most fights, and more likely to claim that their sibling did. In contrast, for perceptions of winning fights, children were especially likely to claim that they themselves won most fights, and unlikely to suggest that their sibling won most fights or

that both siblings won an equal number of arguments. Table 7 depicts the number of children who chose each response option.

Table 7

Frequencies of Responses Regarding Who Usually Starts and Wins Sibling Conflicts

	Usually Sibling	Both Equally	Usually Self	Total
Starts Fights	15	8	1	24
Wins Fights	3	3	20	26

Note. Responses to the question regarding who starts fights were missing for 2 participants.

Positive and negative actions of self and sibling. A 2 x 2 within-subjects ANOVA was conducted with Referent (self or other) and Valence (positive or negative) entered as separate factors. The main effects for both Referent, $F(1, 25) = 21.95, p < .001$, and Valence, $F(1, 25) = 16.89, p < .001$, were significant, but were qualified by a significant Referent x Valence interaction, $F(1, 25) = 10.09, p = .01$. Children were much more likely to mention their sibling's negative actions ($M = 5.69, SD = 3.92$) than their sibling's positive actions ($M = 2.42, SD = 2.18$), $F(1, 25) = 17.41, p < .001$. However, they were equally likely to talk about their own positive ($M = 1.69, SD = 1.09$) and negative ($M = 2.50, SD = 1.90$) actions, $F(1, 25) = 3.65, p = .07$.

Selective justification of own actions. A 2 x 2 x 2 within-subjects ANOVA was conducted with Referent (self or other), Valence (positive or negative), and Justification (yes or no) entered as separate factors (see Figure 4). The Referent x Justification interaction was significant, $F(1, 25) = 25.24, p < .001$. Specifically, children were much more likely to justify their own actions than the actions of their siblings. However, this

effect was also qualified by a 3-way Referent x Valence x Justification interaction, $F(1, 25) = 6.54, p = .02$. Post hoc t -tests revealed that, with the exception of one's own negative actions, children were much more likely to leave actions unjustified than to justify them, $t_s > 4.65, p_s < .001$. However, when children described their own negative actions, the difference between the number of justified and unjustified actions was smaller, $t(25) = 1.73, p = .10$. In other words, when describing their own negative actions, children were as likely to justify them as not.

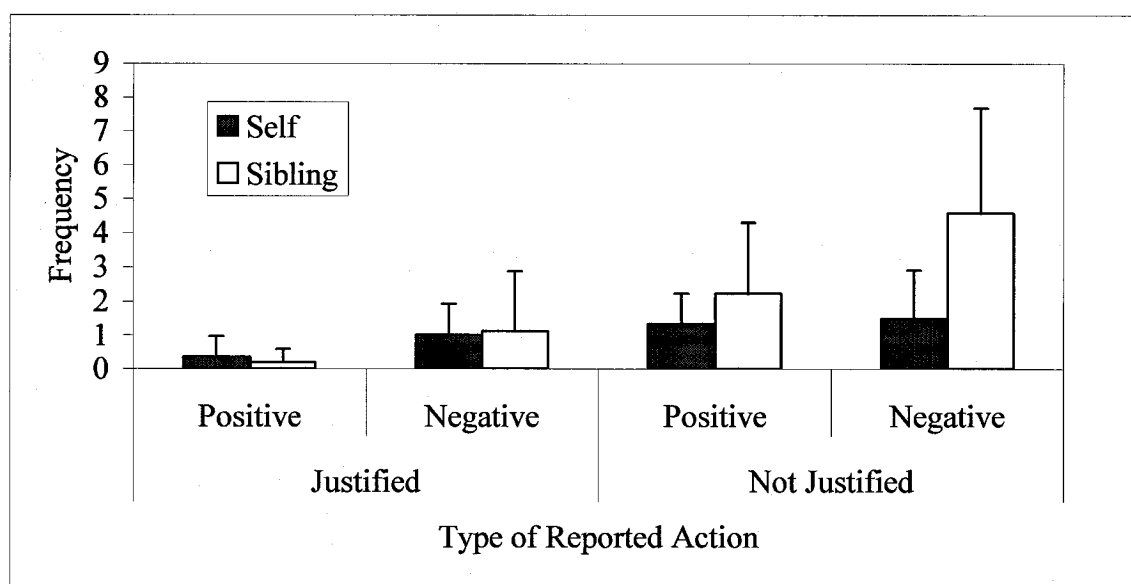


Figure 4. Children's descriptions of their own and their siblings' positive and negative actions (+SD).

Relationships between measures of self-serving bias. Correlations were computed between each of the measures of self-serving bias: Perceptions of starting fights, winning fights, denigration of other, enhancement of self, and selective justification of own actions (see Table 8). Note that, with the exceptions of starting and winning fights, scores were computed as proportions of children's total talk during the sibling interview.

Interestingly, children's tendency to selectively mention their sibling's negative actions while omitting their own (denigration of other) was negatively related to a number of the other bias variables. Specifically, denigration of other was negatively related to children's tendency to claim that they themselves won the majority of their fights and the selective justification of their own actions. A trend also suggested a negative relationship between denigration of other and children's claims that their siblings started the majority of their fights.

Table 8

Correlations between Measures of Self-Serving Bias

	Starts Fights	Wins Fights	Enhance Self	Denigrate Other	Selectively Justify
Starts	--	.18	-.02	-.36 ^t	.08
Fights					
Wins		--	-.12	-.42*	.28
Fights					
Enhance			--	.08	-.07
Self					
Denigrate				--	-.62**
Other					
Selectively					--
Justify					

^t $p < .10$ * $p < .05$ ** $p < .01$

Summary. Within the age range tested, there were no significant developmental differences in the degree to which children exhibited self-serving biases in relation to their sibling interactions. However, as predicted, overall results suggested that children are generally biased in favour of the self. Children claimed that their sibling started more fights, that they themselves won more fights, and that their sibling perpetrated more negative actions. In addition, when children *did* mention their own negative actions, they were more likely to justify them than they were to justify their other statements about self or other. Finally, all of the relationships between the measures of self-serving bias were either nonsignificant or negative, suggesting that there are various ways to be biased that are not necessarily analogous to one another.

Social-Cognitive Ability and Children's Self-Serving Biases

Partial correlations (controlling for the child's age at T1) were computed between each of the child's scores on the three measures of social-cognitive ability at T1 and the five measures of self-serving bias at T2 (starting fights, winning fights, denigration of other, enhancement of self, and selective justification of own actions). Of the 15 correlations, only the negative relationship between children's scores on the bear game and their later tendency to claim that they themselves won the majority of their fights was significant, $pr = -.44, p = .04$.

Family Talk about Internal States and Children's Self-Serving Biases

Partial correlations (controlling for the child's age at T1) were computed between all of the major sets of internal state variables (T1) and children's self-serving biases (T2).

Self-serving biases and categories of internal state language. Children's overall use of internal state language was not significantly related to any of the measures of self-serving bias, nor was their use of any of the specific categories of this language (e.g., goals, beliefs). On the other hand, there were trends for overall maternal use of internal state language to be negatively related to children's enhancement of self ($pr = -.34, p = .09$) and, contrary to expectations, positively related to denigration of other ($pr = .37, p = .09$). When specific categories of maternal internal state language were examined, results revealed that maternal talk about goals was related negatively to enhancement of self and positively to denigration of other ($pr = -.43, p = .03$ and $pr = .44, p = .03$, respectively). In addition, the relationship between maternal talk about beliefs and children's selective justification of their own actions approached significance ($pr = .35, p = .09$).

Self-serving biases and referent of internal state language. Correlations were computed between children and mothers' talk about the child, mother, and baby (as a proportion of total talk) and each of the measures of self-serving bias. Children's talk about the baby was negatively related to their later tendency to claim that they themselves won the majority of their fights ($pr = -.45, p = .02$). There was also a trend for children's talk about the mother to be negatively related to a later focus on their sibling's negative actions (i.e., denigration of other; $pr = -.34, p = .09$). Finally, another trend suggested a negative relationship between children's talk about self and later claims that their sibling started the majority of their fights ($pr = -.39, p = .07$). Interestingly, mothers' talk about the baby's internal states was positively related to children's later denigration of other ($pr = .40, p = .05$). In addition, the degree to which mothers talked about the child's and her

own internal states were both negatively related to later enhancement of self by the child (both pr s = $-.36$, although p s = $.07$).

Self-serving biases and target of internal state language. The proportions of children's internal state talk specifically to their mothers or to the baby were correlated with the measures of self-serving bias. Children's talk to the baby was negatively related to their tendency to claim that they themselves won the majority of their fights (pr = $-.53$, p = $.01$). In addition, the relationship between children's talk to their younger sibling and selective justification of their own actions was in the expected direction (pr = $-.33$) although it did not reach significance (p = $.10$).

Mother's internal state talk to the child was negatively related to enhancement of self (pr = $-.45$, p = $.02$). In addition, a positive relationship between mother's talk to the baby and denigration of other approached significance (pr = $.38$, p = $.06$).

Self-serving biases, causal connectedness, and function of children's internal state language. As predicted, children who used causally connected internal state language exhibited fewer self-serving biases two years later. The degree to which children used internal states as reasons was negatively related to later claiming that their sibling started most of their fights (pr = $-.46$, p = $.03$). In addition, children who provided reasons for internal states were less likely to later claim that they themselves won the majority of their fights (pr = $-.39$, p = $.05$).

Surprisingly, children who used internal state language for self-oriented purposes were less likely to later claim that their sibling started most of their fights (pr = $-.50$, p = $.02$). None of the other partial correlations between measures of self-serving bias and the

inferred functions of children's internal state language approached significance ($prs < .29, ps > .16$).

Self-serving biases and maternal responses to children's internal state language.

As predicted, the degree to which mothers opposed children's references to internal states was negatively related to children's later claims that their sibling started the majority of their fights ($pr = -.44, p = .03$). None of the other relationships between the types of maternal responses to children's internal state language and measures of self-serving bias approached significance ($prs < .28, ps > .17$).

Summary. Consistent with hypotheses, associations between internal state language and self-serving biases were specific, rather than general. Children's talk to and about the baby was negatively related to later claims that they themselves won the majority of their fights, as was children's tendency to provide reasons for their internal states. In addition, children's use of internal states as reasons and use of internal states for self-oriented purposes negatively predicted their claims that their sibling started the majority of their fights.

Specific forms of mothers' talk about internal states also predicted children's self-serving biases, albeit in somewhat paradoxical ways. In some cases, maternal talk about internal states was positively related to children's self-serving biases. Maternal talk about goals was related to children's later denigration of other, and maternal talk about beliefs was related to children's selective justification of their own actions. In addition, mothers who talked more to and about the baby in conversation had children who were more likely to later focus on their younger sibling's negative actions. In contrast, mothers' talk about goals and talk to the child were negatively related to children's later focus on their

own positive actions. Also, the degree to which mothers opposed their children's internal state references was negatively associated with children's claims that their sibling started most fights.

Discussion

The main goal of this study was to determine whether children's early social-cognitive skills and family conversations are associated with the magnitude of their later self-serving biases. Although hypotheses concerning associations between social-cognitive ability and bias were not strongly supported, there was some evidence that internal state language in conversations with mothers is related to children's later biases in recall of the sibling relationship. However, as a rule, these associations were specific rather than general and, interestingly, mothers' and children's talk about internal states seemed to be related to children's biases in quite different ways.

Secondary goals of this study were to examine the characteristics of family conversations about internal states, how mothers' and children's talk are interrelated, and whether these conversations were associated with children's concurrent social-cognitive abilities. Although relationships between family conversations and children's social-cognitive skills were relatively weak, results suggest a number of interesting individual differences in the nature of mothers' and children's talk about internal states.

Relationships between these T1 variables will be covered first, followed by overall findings regarding self-serving biases in middle childhood, and last, the earlier correlates of children's self-serving biases will be discussed.

Concurrent Associations with Children's Talk about Internal States

The results of this study suggest substantial differences in the manner and sophistication with which children talk about internal states with their mothers and younger siblings. A number of variables were associated with the nature of children's internal state talk. Specifically, variability in the frequency, content, and function of children's talk was associated with: (a) children's ages, (b) children's scores on social-cognitive tasks, (c) maternal talk about internal states, and (d) maternal responses to children's internal state language. Each of these sets of associations will be discussed in turn.

Developmental differences in children's talk about internal states. The older children in our sample not only talked more about internal states in their conversations with others, but the nature of their talk was more varied in content and function. Specifically, as children grew older they talked more about others' internal states, whereas the degree to which they talked about themselves remained constant. In addition, older children were more likely to use internal state language for a variety of purposes (i.e., self-oriented, other-oriented, and expressive), whereas younger children were more likely to discuss internal states exclusively to attain their own goals. These developmental differences suggest that children become more sophisticated and other-oriented in their use of internal state language as they age. Although older children certainly still talked about themselves and used internal state language to meet their own goals, talk about others and/or which served the benefit of others became proportionally more frequent in their repertoires.

Somewhat surprisingly, given the above findings, older children were also more likely to refer to internal states in a causally disconnected way than were their younger

counterparts. Does this mean that older children conceptualize internal states in a more disconnected way (i.e., as unrelated to behaviour)? Since this possibility seems unlikely, it may be useful to consider developmental changes in the contexts in which children tend to use internal state language, in conjunction with the contexts that are most conducive to children's use of justification and reasoning. Anecdotally, in this data set, it seemed that children used justification more frequently in the context of conflict or disagreement than in more neutral conversations. For instance, children often used references to their own internal states to support their position in arguments with mothers (e.g., "Give me one more cookie... please, I want it.") or siblings (e.g., "Stop Jeffrey, I don't need your help."). Indeed, previous research suggests that young children may use justification more frequently when their interests are at stake (Dunn, 1994). Thus, the finding that older children use proportionally *less* causally connected internal state language may be consistent with the notion that they are using this language in more varied contexts, and more frequently in a strictly conversational way (e.g., "I like happy clowns."). Future research should compare children's use of causally disconnected vs. connected internal state language in different contexts (e.g., play, conflict, etc.) to determine whether this is indeed the case.

Social-cognitive ability and children's talk about internal states. Children's social-cognitive abilities were not related to their overall proportion of talk about internal states. However, there were a number of more specific associations between children's social-cognitive skills and the content of their internal state language. In general, relationships were strongest between children's scores on the bear game (measuring perspective-taking abilities) and their internal state language. Children's scores on the

bear game were related to their proportions of talk about emotions as well as their explicit references to the reasons underlying internal states. Thus, children's ability to put themselves in another's shoes may be related to the extent to which they explicitly connect internal states to their underlying causes. It may be that internal state language is simply an index of children's current ability to understand the perspectives of others (e.g., Wellman & Woolley, 1990). However, it is also possible that these two variables are causally connected, such that children's conversations about internal states are supported by (Welch-Ross, 1997) or are informing their social-cognitive understanding (Bartsch & Wellman, 1995; Furrow et al., 1992). In fact, research exists that supports both causal models, so future experimental and/or longitudinal work will be required to draw causal conclusions from the pattern of associations that evidently exist between children's social understanding and interactions with others.

It is less clear why children's scores on the bear game were specifically connected to their talk about emotions, given that affective perspective-taking was just one aspect of their bear game score. Future research should incorporate laboratory measures of perspective-taking that allow a more refined examination of different aspects of perspective-taking (i.e., perceptual, cognitive, and affective).

Children's social-cognitive abilities and maternal talk about internal states. In addition, there were various associations between maternal talk about internal states and children's social-cognitive skills. In this case, children's scores on the secret game appeared to be particularly relevant. Specifically, with child age controlled, mothers of children who scored higher on the secret game were more likely to talk about beliefs, less likely to talk about emotions, and more likely to discuss their own internal states. These

two types of maternal internal state talk (i.e., about self and beliefs) may be particularly challenging for children to understand, given that children's understanding of beliefs is relatively late-developing as compared to emotions or desires (Beeghly, Bretherton, & Mervis, 1986; Wellman & Bartsch, 1994), and that considering the perspective of one's mother might also be a relatively challenging task. Thus, it is possible that children with more advanced social-cognitive abilities may lead mothers to talk about internal states in a more complex way or, alternatively, that mothers who tend to talk in a more sophisticated manner have a positive influence on their children's understanding of internal states. Although we cannot rule out the possibility that a third variable is leading to both outcomes, both of these hypotheses would be interesting to pursue in future research. Nevertheless, it is unclear why mothers' talk about beliefs and/or herself would be specifically linked to children's ability to understand the link between seeing and knowledge, as opposed to the more obvious candidate, perspective-taking skills. Following from Welch-Ross (1997), it is possible that there may be a link between children's understanding of the connection between seeing and knowing and their ability to grasp that their mothers' knowledge is rooted in personal experience. That is, mothers' talk about their own perspectives may be incomprehensible to children who lack this understanding, because these children will have no explanation for the source of their mothers' divergent perspectives. Nevertheless, although Welch-Ross (1997) argues that children's understanding is a necessary condition for benefiting from their family conversations, it may also be true that these conversations in turn contribute to children's sociocognitive understanding.

Although a few interesting relationships emerged between children's social-cognitive skills and family talk about internal states, the general lack of significant effects is much more striking. Of 29 measured relationships, only five were significant and one other approached significance, which clearly leaves open the possibility that the significant findings resulted from Type I errors. In addition, although this study had limited power to detect small effects, methodological problems with the social-cognitive measures used may also have contributed to the lack of significant findings. For instance, the bear game was a multi-dimensional measure that made heavy verbal demands on children, and these two factors alone may have been sufficient to mask many relationships between children's perspective-taking ability and internal state language. In support of this notion, effect sizes for relationships between categories of internal states and social-cognitive measures were smaller than in previous studies, suggesting an issue beyond simply limited power. In any case, it is certainly inappropriate to conclude from this study that the measured social-cognitive abilities are unrelated to children's ability to talk about internal states with family members, particularly considering an existing body of research suggesting that interesting associations do indeed exist (e.g., Brown et al., 1996). Nevertheless, similar to the current study, most of the previous research in this area was based on relatively small sample sizes, and future replication of past findings would still be of value. Indeed, if our results are accurate, it may be that there are in fact few concurrent relationships between these variables, but that early conversations still contribute to later socio-cognitive development (Dunn, Brown, & Beardsall, 1991).

Associations between family members' talk about internal states. As predicted, there were a number of relationships between mothers' and children's talk about internal

states. The overall proportions of mothers' and children's talk about internal states were related. In addition, significant associations were found between mothers' and children's corresponding references to two of the five internal state categories. Specifically, the proportions of mothers' and children's references to preferences and goals were related. In addition, the degree to which mothers and children talked about the child him/herself were associated. These results are consistent with research suggesting that the frequency of mothers' internal state language may influence the amount of children's talk (e.g., Jenkins et al., 2003), although we are unable to examine longitudinal associations or make causal claims. Similarly, there appear to be individual differences in the specific content of family members' talk about internal states, which is consistent with the notion that mothers' particular focus in conversation may influence children's choices of topic (e.g., Dunn, Bretherton, & Munn, 1987; Haden et al., 1997; Peterson & McCabe, 1994). At any rate, as predicted, mothers' and children's tendencies to talk about specific categories of internal states are clearly linked. It will rest with future researchers to determine the precise nature of the mechanisms underlying these associations.

Maternal responses to children's internal state language. Mothers tended to respond to children's internal state language in different ways as a function of the content and function of children's talk. When children referred to their own internal states, mothers were most likely to support them. In contrast, when children referred to their mothers' internal states, mothers were equally likely to oppose or support them. Finally, when children talked about the baby's internal states, mothers were most likely to ignore them. As discussed earlier, this last pattern is likely attributable to the finding that the vast majority of children's references *about* the baby were directed specifically *to* the

baby. Thus, it makes good sense that mothers were unlikely to respond under these circumstances. However, what could explain the different pattern of responses to children's talk about themselves versus their mothers? It is possible that mothers felt more justified in disagreeing with their child's references to their mother's internal states than they did when the child was discussing his/her own perspective. That is, mothers may have been reluctant to respond in an oppositional manner when children shared information about their own perspectives. This may be particularly true, given the widespread parental goal of encouraging children to express internal states in appropriate ways. In contrast, mothers have privileged access to their own perspectives, and may have felt more qualified/warranted to correct their children, when appropriate. Consistent with previous work (Sabbagh & Callanan, 1998), this pattern suggests that mothers' responses to children's internal state language may serve an important didactic purpose in children's understanding of others' perspectives. For instance, one mother explained to her child that she did not want to read the story "Hansel and Gretel" because it made her feel sad, not because she didn't like witches (the child's first guess). Thus, mothers may use conversations about internal states to highlight differences between their children's perspectives on the world and the perspectives of others.

In addition, mothers showed a characteristic pattern of responsiveness to children's self-oriented references to internal states. Mothers were most likely to either support or ignore children's references that served expressive or other-oriented purposes. However, when children referred to internal states to achieve their own goals, mothers were unlikely to ignore these references, and equally likely to support or oppose them. When one examines the specific pattern of means, it becomes clear that these differences

are due almost entirely to mothers' increased likelihood of opposing children's self-oriented references to internal states. In the context of naturalistic family interactions, preschoolers tend to have many goals that are either impossible or undesirable for mothers to fulfill. Thus, mothers may need to oppose self-oriented references more often than neutral conversational statements or statements aimed at achieving goals that are mutually beneficial for all involved. In addition, self-interested statements may be difficult to ignore, either because of children's persistence, the affective tone of the exchanges in which they occur, or because, by nature, these types of statements strongly call for a definitive response.

Finally, although mothers were equally likely to support, oppose, and ignore references that were causally connected (i.e., used as reasons or justified in their own right), they were unlikely to oppose references that were *not* causally connected. In other words, mothers were more likely to either support or ignore these references than to oppose them. Why might this be the case? As described above, previous research suggests that children are especially likely to use justifications in the context of conflicts with others, when their own interests are at stake (Dunn, 1994). Indeed, an anecdotal examination of the transcripts in this study suggests that these children were no exception. Children often used internal states as reasons in attempts to solicit help ("Pull this, I want it to come off"), food ("Give me something to eat quick, mom, if you don't want me to go to sleep"), or attention ("Play with me, it will be fun") from their mothers. As such, it makes sense that supportive and oppositional responses occurred more frequently in conjunction with this type of internal state language, since mothers had to either explicitly grant or deny children's requests. In contrast, children's causally

disconnected internal state language tended to occur across a variety of contexts. As such, for this subset of children's internal state language, the need to respond oppositionally might arise less frequently.

Interestingly, as children grew older, mothers were less likely to respond to their references to internal states. There could be a number of causes underlying this phenomenon. First, older children may require less scaffolding by their mothers. Although 3-year-olds may require more parental feedback to assist them in carrying on conversations about perspectives, 5-year-olds are relatively more experienced in discussing their own and others' internal states in conversation. As such, mothers may be less inclined to take on a didactic role in conversations with older preschoolers. However, another possibility is that mothers of older children may simply be more inclined to carry on with their own activities while their children are at play. Although younger children may require a greater amount of supervision, mothers may feel more comfortable leaving their older children to play on their own. Nevertheless, this second possibility seems less likely, given the fact that children's utterances were often directed specifically at their mothers. Related to the above points, it should be noted that since older children refer more frequently to internal states than younger children, mothers may actually be responding at the same rate, but a relatively greater proportion of internal state references may be disregarded. Finally, developmental differences in mothers' responses to children's internal states could be simply linked to changes in the function and content of children's internal states. For instance, as described above, mothers are more likely to ignore references that are not used for self-oriented functions. Incidentally, it is precisely these types of children's talk about internal states (i.e., other-oriented and expressive) that

increase with age. Thus, maternal responses may be less frequent as children grow older as a result of changes in children's characteristic ways of discussing internal states.

Children's Self-Serving Biases in Middle Childhood

With a few minor exceptions, the results of this study replicated previous research examining children's self-serving biases in recall of the sibling relationship (McGuire et al., 2000; Ross et al., 2004; Wilson et al., 2004). Overall, children in this study exhibited a number of self-serving biases. They claimed that their siblings started most of their fights, while they themselves won most fights. In addition, they were more likely to mention their sibling's negative actions than their sibling's positive actions, whereas they were equally likely to describe their own positive and negative actions. Finally, children were much more likely to justify their own actions than the actions of their sibling. Upon closer examination, this effect was almost entirely due to children's tendency to provide justifications specifically for their own *negative* actions. Thus, children made excuses for their own transgressions, while more often leaving their siblings' negative actions unjustified.

Although the above findings successfully replicate most of the results of previous research examining self-serving recall biases (Ross et al., 2004; Wilson et al., 2004), the expected developmental differences in children's self-serving biases were not found. In this study, children's self-serving biases did not become more sophisticated with age. Assuming that this null effect was not simply due to a lack of adequate power, there are two plausible explanations for the lack of development in the nature of children's self-serving biases. First, children's ages at the second time point of this study ranged only from 5 to 7 years. As such, it may have been difficult to detect developmental changes

within such a truncated age range. Indeed, previous research has examined differences between preschoolers (3- to 5-year-olds) and school-aged children (5- to 9-year-olds), leading to more robust differences between groups. Second, it may be that previous researchers have misinterpreted differences in the sophistication of self-serving biases as age effects, when in fact they are birth order effects. To some extent, age and birth order were confounded in previous studies because first-borns were, on average, older than second-borns. If qualitative differences in the nature of children's self-serving biases are due to being a first versus second-born sibling, as opposed to an older or younger child (i.e., a developmental effect), our sample of exclusively first-born children would exhibit no variability in this regard. Although this second possibility is not well-supported by previous data (Wilson et al., 2004), future researchers should be cautious about disentangling age and birth order effects on self-serving biases in recall.

This study, to our knowledge, constitutes a first-attempt to look at the relationships between different measures of self-serving biases in recall. In general, results suggest that the various measures of self-serving bias (i.e., starting fights, winning fights, enhancing self, denigrating other, selective justification of own actions) are relatively independent of one another. However, contrary to expectations, children's denigration of other was significantly negatively related to two other bias variables. Specifically, children's tendency to focus on their sibling's negative actions was negatively related to their claims that they themselves won most fights, and their tendency to selectively justify their own actions. These results suggest that there are various means whereby children can exhibit self-serving biases, and that these strategies may be at odds with one another. In some respects, the negative association between a

focus on the other's negative actions and a tendency to selectively justify one's own actions echoes the developmental progression elucidated by previous research. That is, Wilson et al. (2004) and Ross et al. (2004) showed that younger children were more likely to deny their own negative actions, whereas older children were more likely to justify them. As such, this negative association may reflect individual differences in the sophistication of children's self-serving biases within a specific age range. The findings of Wilson et al. (2004) provide some support for this conclusion. They found that first-born siblings who used more justifications for actions in recall of sibling conflicts tended to use fewer outright denials of conflict actions. Similarly, children's claims that they usually win their fights may be an even less sophisticated strategy than focusing on one's sibling's negative actions in conflict. It may be that children are able to protect a positive self-view by using *either* the denigration of other *or* a focus on selective victory, rather than resorting to both of these strategies simultaneously.

Predictors of Children's Later Self-Serving Biases

The primary goal of this study was to determine whether children's earlier social-cognitive skills and conversations with family members would predict individual differences in the extent of their self-serving biases two years later. Although children's scores on the three laboratory measures of social-cognitive ability were not strongly related to their self-serving biases, a number of interesting associations emerged between family members' talk about internal states and children's later biases. Specifically, the referent, target, causal connectedness, and function of children's internal state language were all related to children's later biases. In addition, the category, referent, and target of maternal talk about internal states were related to children's later self-serving biases, as

was the nature of her responses to children's own internal state language in conversation. Each of these associations is discussed in turn.

Children's talk about internal states. As predicted, children's talk about the baby was negatively associated with one type of later self-serving bias (specifically, their tendency to claim that they themselves won most of their fights). Thus, it appears that children's focus on the internal states of their sibling in conversation is specifically related to a more balanced recall of events two years later. One possible interpretation of this association is that children who have a more other-oriented perspective are more likely to encode, represent, and/or retrieve a less egocentric version of shared experiences. The association between talk about the baby and self-serving biases might also be explained, at least partially, by differences in the quality of the relationship between siblings. That is, children with greater positive regard for their younger siblings might be more likely to attend to their sibling's perspective during their interactions, to focus on their sibling's point of view in family conversations, and/or be motivated to present their sibling in the best possible light when describing their relationship to others. Note that the design of the present study did not allow us to distinguish between the contributions of biased memory and impression management to the production of self-serving biases.

Second, children's talk about internal states specifically directed at their younger siblings was negatively related to their tendency to claim that they themselves won most of their fights. Thus, children's internal state talk specifically in conversation with their sibling was a better predictor of bias than children's talk about internal states in conversation with their mothers. This finding suggests that sibling interaction, in contrast

to mother-child interaction, is particularly associated with children's later development of a balanced view of their sibling relationship. Dunn (2002) has argued that the sibling relationship may be particularly conducive to the development of social understanding, given the intimate, reciprocal, and intense nature of this bond. In particular, sibling interactions serve as an excellent training ground for the development of shared meanings, which may in turn influence the way that children conceptualize their interactions with their brother or sister. Related to this point, a close bond with one's sibling might also be predictive of a decrease in self-serving biases, given that it will decrease children's motivation to appear superior to their sibling. Children's internal state language to the baby might suggest both a more positive relationship with their sibling (e.g., Howe, Rinaldi, Jennings, & Petrakos, 2002) and a greater ability to develop shared meanings in play (Howe, LeFebvre, Petrakos, & Rinaldi, in press). Thus, these might be two possible explanations for the observed association.

In addition, children's tendency to use internal state language in a causally connected way was associated with various measures of self-serving bias. Their use of internal states as the reasons underlying behaviour was negatively related to later claims that their sibling started most fights. Also, children who provided more reasons for internal states were less likely to later claim that they themselves won most of their fights. Thus, in general, children who tended to talk about internal states in causally connected ways were less likely to be biased in their later descriptions of their sibling. This finding is consistent with past research indicating that causal organization of narratives improves the accuracy and comprehensiveness of recall (Trabasso & Van den Broek, 1985). That is, assuming that a more balanced representation of past events is

more accurate in an "objective" sense, children who think about perspectives in causally connected ways may tend to have a better perspective on the "big picture," and may be less likely to represent and/or recall events in an egocentric manner.

Finally, contrary to hypotheses, children's use of internal state language for self-interested purposes was negatively related to their later claims that their sibling started most fights. Assuming that this effect is not simply due to error, one plausible explanation for this finding is that children who focus on internal states for self-interested purposes tend to have less advanced sociocognitive skills relative to their peers. Thus, these might be the same children who do not realize the benefit of presenting oneself in the best possible light to the interviewer. In other words, children who are more egocentric may not be as proficient at managing the impressions of others. A semi-structured interview technique based on children's reports of past conflicts is helpful in revealing the magnitude of children's self-serving biases, but may not be as useful in disentangling their causes. That is, memory and impression management may both play a role in producing a self-serving bias, and they could themselves result from unrelated mechanisms. As such, children's observed biases could correlate with other variables in seemingly contradictory ways. The challenge for future researchers is to find ways of examining the unique effects of conscious and unconscious processes on self-serving biases, and in turn to explain individual differences separately for each underlying cause.

Maternal talk about internal states. Maternal use of internal state language was also related in various, often seemingly contradictory, ways to children's later self-serving biases in perceptions of their sibling relationship. First, mothers' talk about goals was negatively related to children's enhancement of self and positively related to their

denigration of other. Thus, children whose mothers talked more about goals seemed particularly likely to disparage their sibling while not simultaneously painting themselves in the best possible light. What might explain these associations?

Although the limited sample size of our study did not allow us to examine interactions between internal state variables in predicting self-serving biases, related findings regarding the referent of mothers' talk about internal states may help to elucidate the reasons for this association. That is, although children's talk about the baby was generally negatively associated with their later self-serving biases, the opposite was true of maternal talk about the baby. Specifically, mothers' talk about the baby was positively associated with children's later denigration of other. These associations may be explained by considering mothers' motivations for talking about the baby's perspective to her child, and children's possible reactions to this focus. That is, mothers may be especially likely to focus on the baby's perspective with a child who is unable or unwilling to take their younger sibling's perspective into account. Thus, this talk might be a reaction to early evidence of a problem in the sibling relationship. As such, it could be that maternal talk about the baby's perspective is a symptom of an underlying lack of understanding between siblings, rather than a direct cause of an increase in siblings' self-serving biases. Alternatively, it could be that mothers' focus on the baby actually *leads* to a negative reaction by the child, since he/she may feel that they are being compared unfavourably to their younger sibling, or at least that their perspective is being unfairly overlooked. Thus, under these circumstances, the child might be particularly motivated to paint a relatively negative picture of their sibling. This explanation would be consistent with research examining sibling rivalry, showing that children's *perceptions* of differential parenting

lead to particularly negative outcomes for both children (Boyle et al., 2004). Thus, children who interpret mother's talk about the baby as a threat to their own self-worth may be more likely to disparage their sibling.

The pattern of relationships between the target of mothers' speech and children's later self-serving biases also provided converging evidence for the above interpretations. Specifically, while mothers' talk about internal states to the child was negatively associated with the child's later enhancement of self, the positive correlation between mothers' internal state talk to the baby and children's later denigration of other was marginally significant. Thus, the pattern of findings for both target and referent of speech support the notion that a focus on the baby leads to an increase in self-serving biases, while a focus on the child him/herself seems to diminish the magnitude of these biases. It will rest with future researchers to determine whether these individual differences in maternal talk are a symptom of an early-emerging underlying problem with the sibling relationship, or whether they are themselves a cause of children's later biased reports.

Finally, the nature of maternal responses to children's references to internal states was related to children's later self-serving biases in recall. As predicted, the extent to which mothers opposed their children's references to internal states was negatively associated with children's later self-serving biases (i.e., their claims that their younger sibling started most of their fights). Although this finding is consistent with the above interpretation that children who receive more attention by their mothers are less likely to exhibit self-serving biases, it is also consistent with a socialization hypothesis. That is, children of mothers who respond in informative ways to their early references to internal states may develop a better understanding of how their perspectives on events may differ

from those of others (Sabbagh & Callanan, 1998). Thus, mothers' informative feedback may help children to achieve a more comprehensive understanding of the different ways in which one and the same event can be interpreted, and may therefore decrease the magnitude of their later self-serving biases.

Summary

Although the results of this study revealed a relatively complex set of relationships between the social-cognitive variables measured at T1 and later measures of self-serving biases, various consistent patterns emerged. First, mothers' and children's use of internal state language are clearly related, and often these relationships are very specific, rather than general. As described above, this seems to support a socialization, rather than genetic, hypothesis since the results are likely too specific to be simply related to individual differences in families' levels of cognitive sophistication or 'mind-mindedness'. In addition, results suggest that mothers may influence their children's use of internal state language by selectively modelling and reinforcing certain types of references. Although it will rest with future researchers to determine the precise causal nature of these associations, the pattern of correlations presents a promising area for study.

In contrast, mothers' and children's talk about internal states were less strongly associated with children's scores on laboratory measures of social-cognitive ability. This null effect is surprising, considering the wealth of previous research that has supported these associations (Bartsch & Wellman, 1995; Brown et al., 1996; Furrow et al., 1992). As discussed in the limitations section below, the measures employed to test children's

social-cognitive abilities may not have been ideally suited to testing the present hypotheses, and may have presented some methodological challenges.

Similarly, laboratory measures of children's social-cognitive ability were less strongly associated with their later self-serving biases than were maternal and child use of internal state language. Although clearly methodological issues may have played a role in this lack of association, the relatively general and decontextualized nature of these measures may have also limited their applicability to children's real-life social reasoning. As argued by social constructivist theorists, children's experience with familiar others makes their close relationships an ideal context in which to develop shared meanings and express personally-relevant perspectives (Carpendale & Lewis, 2004; Dunn, 1988). According to this view, children's applied social understanding (as demonstrated through their interactions with others) may be more relevant to their later thinking and recall about family experiences than their scores on social-cognitive tasks in a laboratory setting. Thus, depending on the particular child or measure, the laboratory tasks may have either over- or under-estimated children's true ability to use their social-cognitive abilities in an applied setting, whereas their internal state language may constitute a more accurate measure of how well children are able to apply their cognitive skills to interactions with others.

Finally, a number of interesting relationships emerged between children's and mothers' internal state language and children's later self-serving biases. In general, children's use of internal state language that focused on the perspectives of others, that was causally connected, and that had personal emotional significance for the child (i.e., a self-interested function) tended to negatively predict children's later self-serving biases.

In addition, it was specifically children's talk to their younger sibling, rather than their mothers, that acted as a negative predictor of bias. These results as a whole suggest that individual differences in children's tendency to consider the perspectives of their younger siblings may relate to the degree of bias in their later memory and/or recall of shared events. Thus, variability in children's ability and/or willingness to put themselves in their siblings' shoes may persist over time. In addition, these results support the notion that connected communication with close family members may be associated with children's later social understanding (e.g., Carpendale & Lewis, 2004; Dunn, 1988). Given that causal coherence and personal significance were particularly associated with later decreases in the magnitude of self-serving biases, it also appears that some forms of conversation about internal states may be more meaningful to children's social-cognitive development than others, and/or may reflect differences in children's existing levels of social understanding. These differences, in turn, may continue to manifest themselves two years later in children's development.

Surprisingly, maternal use of internal state language was often associated with *increases* in the magnitude of children's later self-serving biases. However, the specific pattern of relationships suggests that it is particularly a focus on the baby that may be associated with children's later biases. Specifically, maternal talk to and about the baby was related to increases in the magnitude of these biases, whereas talk directed to the child him/herself was associated with weaker bias. Thus, as discussed earlier, maternal focus on the baby's perspective may be symptomatic of the child's failure to take the baby's perspective into account, or a more general negative style of interaction between her children. Moreover, this focus on the baby may itself either cause or exacerbate the

child's tendency to denigrate their sibling in comparison to him/herself, thus leading to an increase in the magnitude of self-serving biases. At the same time, maternal responsiveness to the child's internal state language was associated with fewer self-serving biases two years later. As such, these responses may either generally support the child's notion that he/she is an important and valued member of their family (as opposed to producing a sense of having one's status threatened by the presence of a younger sibling), or may more specifically lead the child to consider the possibility of multiple conflicting perspectives on a situation. As argued by Haden et al. (1997), the manner in which mothers structure their conversations with their children may influence the way that children narrate their experiences. Thus, mothers who provide informative feedback on their children's references to internal states may help their children to gain a richer understanding of how different people construe the world.

Limitations

There are various methodological limitations imposed by the nature of the existing data set. Specifically, the focus on the older sibling in each dyad did not allow us to test the main effects or moderating influence of birth order, and thus limits the generalizability of the findings. However, this was a preliminary exploration of the interrelationships between these variables, and birth order was not of central concern. In fact, older siblings may play a central role as socialization agents for younger children (Dunn, 2002), so limiting the sample to older siblings ensured that maternal and sibling socialization effects were not confounded.

Clearly, the small sample size also limits the generalizability and power of the study. A particular source of concern is the small number of significant findings,

considering the large number of analyses performed. Thus, results must be interpreted with caution, particularly with regards to the lack of associations between children's social-cognitive abilities and the other measured variables. That is, with a greater amount of power, it is quite possible that some of these associations may have reached significance. In addition, the small sample size precluded some analyses involving complex interactions between independent variables (e.g., child references to baby's goals for other-oriented purposes), and did not allow for tests of the possible mediational effect of sibling relationship quality on the observed relationships. The ability to examine these relationships would potentially have disambiguated the meaning of some of the more complex findings. Nevertheless, despite the limited sample size, various interesting associations emerged between different aspects of family members' conversations about internal states, as well as some relationships between these variables and children's later self-serving biases. Thus, these effects seem to be relatively robust in this population, given their significance in such a small sample, which may be an adequate impetus to examine these associations in a more refined and powerful way in future studies.

This data set was used to test whether family conversations about internal states and children's social-cognitive abilities were associated with children's later biases in perceptions of the sibling relationship. However, it was not possible to test the reverse causal model. That is, perhaps a stubborn refusal to encode and represent events in a balanced way may lead to a delay in the development of perspective-taking ability and change the nature of family communication. Although this relationship seems less grounded in past research and theory, we cannot determine from our data whether a more

complex bi-directional relationship exists between these variables, nor can we directly test our causal theories.

Finally, given the heavy verbal demands and multi-dimensional nature of the laboratory measures of children's social cognitive abilities, these tasks may not have been the ideal measures of children's understanding of the perspectives of others, the seeing-knowing distinction, or the ability to make logical inferences about a person's dispositions based on their behaviour. Although children's social-cognitive test scores in this sample were consistent with the performance of children in earlier studies using the same measures (Abrahams, 1979; Greenberg et al., 1977; Marvin et al., 1976), more refined tests of the first two constructs have been developed since the collection of these data (see Wimmer, Hogrefe, & Perner, 1988, and Wimmer & Perner, 1983, for the earliest versions). Children's performance on these new tests suggests that older measures may underestimate children's abilities (e.g., Pratt & Bryant, 1990). Thus, using updated measures of social-cognitive abilities may provide more accurate assessments of children's skills in these areas.

Implications

Generally, the results of this study are consistent with the notion that children's earlier experiences with family members shape their later understanding and recall of shared events, as well as how they construe their relationships with other. Particularly, their interactions with mothers and siblings may each be related to their later self-serving biases in different ways. Although the pattern of relationships seems to suggest that children's conversations are linked to their self-serving biases via their influence on children's relationship quality with their sibling, their understanding of the perspectives

of others, and the coherence of their representations of internal states and events, the preliminary nature of these results do not allow us to specifically determine the mechanism underlying this longitudinal association. Nevertheless, these associations suggest a number of avenues to guide future research. Specifically, will children's theories of mind and/or quality of their sibling relationship mediate the associations between their earlier internal state conversations and later self-serving biases? If so, are these processes leading to decreases in the magnitude of self-serving biases in recall via their influences on memory, or simply by influencing the extent to which children attempt to manage impressions on their listener? In addition, might sibling relationship quality also moderate the relationship between children's understanding of others' perspectives and the magnitude of their self-serving biases? That is, will children with a positive relationship with their sibling be more likely to use their knowledge of their sibling's perspective to develop a balanced representation of past events than children with a negative relationship with their sibling? Overall, this area of research promises to offer us new insights into the dynamics underlying children's memories of shared experiences, as well as the processes leading to positive versus negative interactions between siblings.

In their study of adolescent conflict processes, Stein, Bernas, and Caliccia (1997) found that positive negotiation outcomes are associated with a good understanding of both one's own and one's opponent's perspective. In this study, adolescents who were able to resolve their conflicts by compromising tended to have a better understanding of both the source and the content of both conflict positions than adolescents who reached a win-loss conclusion. In addition, Ram (2003) found that when 4- to 7- year old children

were given information about their older siblings' preferences in a toy division, they used more positive negotiation strategies, and siblings were more likely to reach maximally beneficial solutions. Together, these results suggest that there may be social benefits associated with perceiving a situation in a less biased, and more comprehensive, manner. Thus, developing a better understanding of the developmental processes underlying individual differences in the magnitude of self-serving biases might help us to shed light on a social-cognitive mechanism important for the development of social competence and positive interpersonal relationships.

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Footnotes

¹ Fewer than 100 utterances were used to calculate MLU in 10/64 cases where children spoke fewer than 100 times in a given session.

² Each child's mean length of utterance (MLU) was also calculated as a second means of accounting for children's general verbal ability. However, children's age and MLU were strongly related ($r = .53, p < .01$). With age controlled, none of the partial correlations between MLU and the major internal state variables were significant. Although it would be ideal to include both variables as control factors, given the limited sample size of this study and the redundancy of age and MLU in predicting variables of interest, MLU was not included in any of the reported analyses.

³ Although other referents were possible (e.g., child and mother, all three family members, other individuals) the frequencies of these categories were typically low, particularly for the child (occurring in fewer than 1% of all conversational turns). In addition, no specific hypotheses were made about children's or mothers' use of these referents. As such, they were not included in analyses examining referent of speech.

⁴ These effects could theoretically be due to the nature of the coding, since the same utterances could be coded for two internal states simultaneously (e.g., I think I want the red one). However, in actuality, these double-coded utterances were relatively rare. For instance, the strongest relationship exists between maternal references to goals and beliefs. However, on average, these two codes co-occurred only 1.72 times ($SD = 2.39$) per family, although mothers referred to beliefs ($M = 24.41, SD = 16.88$) and goals ($M = 47.41, SD = 31.21$) relatively frequently. As such, these cases do not seem to explain the observed associations.

Appendix A: Identification of Internal State References

Categories of Internal State Language:

- 1) **Goals:** References to desires, obligations, attempts, and intentions. These statements indicate an outcome that the actor is heading towards, either because of their wish to do so or due to a sense of need. Here are some terms that signify a reference to a goal:
 - Desires: Want, wish, hope for, pray for, aim for, would like to (distinct from “I like puppies”), would love to, looking for, interested
 - Obligations: Need to, have to, must, am expected to (or expect someone to), obliged to, got to.
 - Attempts: Try to, attempt to.
 - Intentions: Plan to, intend to, mean to, expect to, accident.

- 2) **Beliefs:** References to knowledge and thoughts. These references indicate the subjectivity of a statement (e.g., I *think* that the sky is blue) and present a contrast to hard and true facts about the world. They may also aim to provide information about the extent and content of one’s own or others’ knowledge, or provide a marker to indicate one’s level of certainty about the world (e.g., think vs. know). The following terms indicate a reference to a belief:
 - Think, know (or don’t know), believe, pretend, imagine, guess, remember, forget, not sure, understand, notice, aware, wonder, I’ll bet, figure out.

- 3) **Emotions:** References to feelings (e.g., happy, sad, mad, scared, jealous, etc.) or verbal references to obvious physical manifestations of internal emotional states (crying, laughing). Also includes references to fun or being sorry, or asking what’s the matter/what’s wrong (in reference to an emotional display).

- Positive: curious, excited, feel (good, ok, better, nice, etc.), fun, glad, happy, laugh, love, please, smile, surprise, yum, laugh
 - Negative: afraid, angry, boring, cry, embarrassed, feel (bad, awful, etc.), hate, hating, jealous, lonely, mad, sad, scared, surprised, upset, yuck, scream, hurt.
- 4) **Traits:** This category refers to more permanent mental or personality characteristics of people. Note that traits must be something that is not immediately observable (i.e., “he has a runny nose” is not a trait). Appraisals/Evaluations are also not necessarily coded as traits (e.g., “he eats too much”) unless they refer to personality characteristics (e.g., being lazy). Some examples of traits are as follows:
- Smart, dumb, friendly, mean, funny
- 5) **Preferences:** References to likes or dislikes (e.g. I like puppies). Distinct from goals in that they are relatively stable characteristics (e.g., “I love chocolate ice cream”), rather than fleeting desires (e.g., “I would like chocolate ice cream for breakfast”). Although preferences are conceptually related to emotions, they are distinct in that they require a specific referent (i.e., I like *X*), whereas emotions do not.
- Like, hate, love, enjoy, detest, favourite

Appendix B: Internal State Reference Coding Categories

Code for both mother and child:

1) *Target*: The person who is being spoken to. If a target is the interviewer or someone other than the individuals listed below, the reference should not be coded further.

- **Baby and Older Child**
- **Baby and Mother**
- **Older Child**
- **Mother**
- **Baby**

2) *Referent*: Who is identified as experiencing the internal state? The referent may be implicit and not identified explicitly in the statement, but should still be coded.

- **Baby**
- **Older Child**
- **Mother**
- **Other**
- **Any combination of the above**: Each referent should be identified specifically.

Thus, if a reference pertains to mother and baby, it should be coded as BM (in the order that they appear above).

Code only for child:

1) *Function*: This is a difficult category to code for, mainly because it is so context dependent. Try to look at the dialogue preceding and following the reference for clues as to the speaker's purpose. If a reference is made for both an expressive and an instrumental purpose, code it as being instrumental.

- **Expressive:** References that are made for no obvious instrumental purpose. Purely to inform the other about someone's internal states, without any attempts to promote action or change the world in the immediate present. Also includes attempts to grasp other's internal states, when this is done simply to have a better understanding of them (e.g., "Do you like banana popsicles?"). Although goals tend to *always* imply a desire to change the world, if they refer to the distant future or the past they are typically coded as expressive (e.g., "When I was a little girl I wanted to go to Disneyland"). Often occurs in the context of reflective discussion, simple commentary, or narrative. Also includes simple disagreements about the state of the world (e.g., no, I think that's a yellow crayon, not a red one.).
- **Other-Oriented:** Goal is to promote a change in the other that is at least as beneficial for the other as the self. Includes comforting (i.e., producing a positive change in their emotions), working to produce an end that meets one's inferences about the other's preferences or goals (e.g., "Here's your favourite yellow cup."), helping or teaching behaviour (e.g., "You need to hold that button down"), or attempts to minimize the perceived negativity of the other's actions (e.g., "It isn't his fault, he wasn't trying to do that").
- **Self-Oriented:** Ultimate goal is to achieve an instrumental end for oneself. May take into account other's internal states, but for the purpose of gaining what one desires. These references can be clearly identified as related to an obvious attempt to change the world or promote action in others. Includes attempts to solicit comfort (e.g., "I want a hug!"), assistance (e.g., "You need to help me"), or material goods (e.g., "If you let me go outside, I will be happy") from others, to avoid blame (e.g., "I didn't do

it on purpose!”), or to stop/control others’ behaviour that one finds offensive (e.g., “Sammy, you’re making me crazy!”).

2) *Causal Connectedness*: This category is used to determine whether the internal state is referred to as a cause for and/or a consequence of other behaviour.

Note: First two categories are not mutually exclusive (i.e., one reference can be both a cause and a consequence). The third category can be thought of as the absence of the first two.

- **Used as Reason**: Internal state is identified as being as a reason *for* something. Thus, it is preceded by a conjunction (implied or actual) such as “because” (e.g., “I will eat cheerioes *because I love them*”) or “in order to” (“I will help Mike *in order to make him happy*”). In this case, reference may justify another speaker’s statement, and can still be coded here (e.g., if mother says that child is sad, and child provides a reason, this internal state is coded as a reason).
- **Reason Provided For**: Internal state is justified using other means (i.e., a reason is provided for it). In this case, the consequence must be identified by the speaker him/herself to be coded (i.e., if mother provides a reason for child’s internal state, this reference is not coded as being justified). For example, in the sentence “*I am sad because I can’t go outside and play,*” the child provides a reason for his emotion.
- **Not Connected**: Internal state is neither justified nor used as a justification for another statement (e.g., “I want cookies”).

Code for mother, following each of the child’s references:

1) *Maternal Response*: For each reference, one response is coded (even if that code is “no response”). A statement is coded as a response using counterfactual reasoning – would

mom still have made that response if the internal state reference had not occurred? If not, that statement is not coded as a response. If a response is ambiguous in that it may or may not have been initiated by the reference, it is coded only if it immediately follows the reference (i.e., in the next turn). Choices can be made from the following categories:

- **No Response:** No response is made
- **Oppose:** Response opposes the reference, either by disagreeing, refusing, making a negative emotional display, or providing reasoned argumentation why is it not true/a good idea.
- **Support/Acknowledge:** Response supports the reference, either by agreeing/acknowledging, performing the desired action, or making a positive emotional display.

Appendix C: Example of Sibling Interview Responses

The following is an example of a boy (5.9 years of age) describing his relationship with his younger brother. Italicized lines are speech by the interviewer. Bolded lines were coded as evaluative, unbolded lines were coded as descriptive. Although descriptive lines could be used as justifications for evaluative statements, they were not otherwise included in the calculation of bias scores.

What is it that you really like about your brother? That you think is really neat?

He lets me play with some of his toys

and he lets me come in his room.

He lets me turn on the furnace

when we're watching t.v.

and he lets me climb up on that chair and sit, sometimes.

And we sit together

cause there's only room for both of us.

And we need a blanket up there.

Its cozy.

What is it that you really don't like about your brother? That really bugs you?

Mmm. he doesn't let me play with his balloons.

He didn't do it today.

He closes the playroom door on me

when I want to come in.

He holds it shut.

Can you tell me about a fight you had recently?

Sometimes I have some fights in the middle of the year.

**Jon hit me today
and I hit him back.**

So, I won.

I didn't cry.

**Cause he hit me here (one side of head)
and I hit him here (other side).**

**And then Jon started to cry
when I hit him.**

How do you feel about sharing your toys with your sibling?

Happy. A little bit happy

Are there some things you would rather not share?

My transformers.

Cause Jon broke one.

How does your brother feel about sharing his toys with you?

Happy. A little bit happier than me.

Are there some things he would rather not share?

His carebear.

I have one too.

Is there anything else you want to tell me about your brother?

**Sometimes we play in the morning
when mommy and dad are awake.**

He pushes me

and he talks to me

and he says "shut up".

And he goes in front of the t.v.

and puts the blanket over it

so I can't see.

So I fight him a lot.

He tells me that he hates me.

He really does.

I say like him

and he says I like you.