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Emotion Regulation in Context: The Jealousy Complex between Young Siblings and Its Relations with Child and Family Characteristics

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Jealousy is a social emotion that has received little attention by developmental researchers. The current study examined sibling jealousy and its relations to child and family characteristics in 60 families with a 16-month-old toddler and an older preschool-age sibling. Sibling jealousy was elicited in social triads consisting of a parent (mother or father) and the two siblings. Positive marital relationship quality (i.e., love and relationship maintenance) was a particularly strong predictor of the older siblings' abilities to regulate jealousy reactions in the mother sessions. Younger siblings' jealous affect with mothers was linked to the child's temperament, whereas older siblings' jealous affect with mothers was related to the child's emotional understanding. Younger siblings displayed more behavioral dysregulation in the mother–sibling triads if there was greater sibling rivalry reported by mothers. Session order (i.e., which sibling was challenged first in the jealousy paradigm) had a strong effect on both the affect and behavioral dysregulation displayed by the older and younger siblings. Results are discussed with respect to the need for future research to consider social relationships as developmental contexts for young children's emotion regulation.

INTRODUCTION

Emotion regulation has recently received a great deal of attention by developmental and clinical scholars. Acquiring emotional control and managing one's emotions in social situations is considered a central developmental task of early childhood (Kopp, 1989; Sroufe, 1996; Thompson, 1994); yet, as Thompson (1994) has noted, the concept of emotion regulation is still "in search of definition," and various definitions of emotion regulation can be found (e.g., Cole, Michel, & Teti, 1994; Garber & Dodge, 1991). Thompson (1994, p. 28) offered the following definition: "Emotion regulation consists of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals." Even though this definition, like others, underscores both internal and external processes, Campos, Mumme, Kermoian, and Campos (1994) pointed out that current empirical work that examines emotion regulation tends to focus on emotion regulation as an intrapersonal process and rarely considers the contextual factors that may contribute to regulation strategies. According to Campos et al. (1994, p. 298), "no treatment of emotion regulation from a functionalist perspective can avoid discussion of the social context that elicited the need for regulation in the first place and that specifies the rules of proper conduct." The purpose of the present report was to expand on the study of emotion regulation by examining the social emotion of jealousy and its regulation in early childhood.

Even though the predominant model of much of current emotion regulation research focuses on intrapersonal regulation, certain complex emotions, such as jealousy, cannot be understood nor even defined without reference to the interpersonal context. In the present article, we argue that studying jealousy between young siblings provides a window on early emotion regulation within the context of family relationships. The study of sibling jealousy underscores the contextual sensitivity of certain emotional reactions, as well as the complexity of family dynamics in contributing to and explaining emotional expression and its regulation.

What Is Jealousy?

Jealousy is a complex social emotion, unlike the basic emotions of anger, fear, sadness, and joy. Jealousy has been studied predominantly by social psychologists within the context of adult romantic relationships (see Salovey, 1991) and is not an emotion that has garnered the attention of most developmental or family researchers. This is rather unfortunate given that concerns about childhood jealousy, often seen as sibling rivalry, surface frequently in clinical and pediatric texts (DelGuidice, 1986; Griffin & De La Torre, 1985; Leung & Robson, 1991; Neubauer, 1983; Pietropinto, 1985), as well as in dozens of books offering childrearing advice to parents (e.g., Bode, 1991; Faber & Mazlish, 1998; Goldenthal, 1999). As with most emerging disciplines, research on romantic jealousy is littered with controversy concerning the conceptualization,

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measurement, and causes of jealousy, and debates have erupted over the distinction between jealousy and envy; whether jealousy is a simple, complex, or blended emotion; and whether it is caused by threats to self-esteem or threats to a valued relationship (for reviews of this literature, see Salovey, 1991; White and Mullen, 1989). Although different definitions have been formulated based on different theoretical orientations, the important point to be stressed for developmental researchers interested in the study of emotion is that jealousy absolutely cannot be defined nor understood without reference to the social context. Regardless of theoretical orientation, one distinguishing characteristic has continued to be underscored by all jealousy theorists: jealousy occurs in the context of a *social triangle.* It should be noted, however, that the triangle may not always involve a third person, as in the case of a woman who is jealous of her husband's love of golf. "What is always true is that jealousy involves a triangle of relations" (Parrott, 1991, p. 16). The present study focused on the social triangle, given our interest in sibling jealousy.

White and Mullen (1989) have referred to the "interpersonal jealousy system" to describe the system of relationships between the three participants of the social triangle. There are three dyadic relationships within the triangle in addition to the triadic relationship system: (1) the relationship between the jealous individual and the beloved (the primary or jealous relationship), (2) the relationship between the beloved and the rival (the secondary or rival relationship), and (3) the relationship between the jealous individual and the rival (the adverse relationship). Several criteria need to be satisfied for the emotion of jealousy to be elicited. As already mentioned, jealousy occurs within a social triangle, yet any three people randomly grouped together will not elicit jealousy. Thus, a second requirement is that the relationship between the jealous person and the beloved must be a valued close relationship. This relationship need not be a love relationship, but often the most powerful jealousy reactions are observed when a love relationship is involved (Buss, 2000). Third, jealousy is triggered by the real or perceived loss of this relationship to a rival. The feelings arising from the loss of a love relationship due to death or separation would not constitute jealousy. Finally, it is not simply the loss of love that produces jealousy, because jealousy can occur in nonromantic relationships. Tov-Ruach (1980) claims it is the loss of formative attention (i.e., the attention that sustains one's self-concept) from the beloved to a rival that is similar across all forms of jealousy. Young siblings are no doubt reacting to this loss of formative attention when a parent turns his or her attention from them and interacts with their brother or sister.

The definition of jealousy and the theoretical framework guiding the current work is based on the original model of romantic jealousy proposed by White and Mullen (1989, p. 1): ". . . jealousy is neither an emotion, nor merely a state of mind, still less a way of behaving. Rather, we believe it is more useful to think of jealousy as particular patterns of emotions, thoughts, and actions that emerge in particular social and psychological situations." Jealousy, then, is an organized complex of emotions, cognitions, and behaviors following the threat to or loss of a beloved relationship to a rival. In the world of siblings, the beloved is one's parent and the rival is one's sibling.

Consistent with White and Mullen (1989), we use the term jealousy complex to underscore this notion that jealousy is a complex of interrelated affects, behaviors, and cognitions organized within a specific social context (for a similar discussion on the organization of emotion, see Averill, 1997). In any jealousy-inducing situation, there may be several possible jealousy complexes, and different complexes may be seen in different social triangles. Thus, there is no single complex of behaviors, emotions, or cognitions that would constitute the jealousy response. For example, one complex may include a cognitive appraisal of potentially losing the relationship to another, the emotional expression of sadness, and behavioral withdrawal from the beloved; whereas another complex might include a cognitive appraisal of the partner's betrayal, the emotional expression of anger, and aggression against the partner as a behavioral response. The current research sought to examine the interrelations between expressed emotions and behavioral coping in a laboratory-based jealousy paradigm. Given the young age of the children studied, we did not focus on cognitive factors such as primary appraisal processes, because these were well beyond the developmental level of the young children studied. Observable behaviors and emotional expressions seemed like a more plausible place to begin.

White and Mullen's (1989) model is consistent with current developmental thinking that underscores the organization of behavior, affect, and cognition (Sroufe, 1996), as well as with dynamic systems and transactional models of emotional development (Fogel et al., 1992; Izard, 1991; Sameroff & Emde, 1989). Jealousy not only defines the person (i.e., the intrapersonal), it also defines a social situation (i.e., the interpersonal). Any person within the triad is embedded within a more complex network of relationships and any change in one component of the system (intrapersonal or interpersonal) can bring about change in an-

other. These dynamic transactions between person and context can change over time as children mature and relationships change. It is possible, however, that the jealousy complex remains stable over time. In other words, even though observable behaviors and emotional expressions may change, continuity may still be seen in the underlying organization of the response (e.g., a focus on betrayal, aggression, and anger). Finally, characteristics of the siblings, characteristics of their parents, the quality of the relationships within the social triangle, and external features of the social environment contribute to both the intrapersonal and interpersonal dynamics of jealousy.

The Emotional Experience of Jealousy

What exactly is the emotional experience of jealousy? Several have proposed that jealousy is a compound or blended emotion consisting of anger, sadness, or fear (Izard, 1991; Plutchik, 1980), but Hupka (1984) has shown quite convincingly that individuals in jealousy-inducing situations express a range of emotions including fear, anger, or even relief, depending on the individual's focus of attention with respect to the social triangle. If individuals focus on the loss of the relationship, for instance, sadness may be reported; if they focus on the betrayal of their partner, they may feel anger; and if they focus on being left alone, they may feel anxiety or fear. Thus, Hupka suggests that the term jealousy does not describe the emotional experience, but provides the explanation of the experience. The basic emotions are sufficient to describe the emotional expressions observed. As Hupka notes, jealous people feel anger, but if asked "why are they angry?", the explanation given is "because they are jealous." In the current work, the basic emotional expressions of anger, distress, sadness, and fear were coded from observations of triadic interaction involving a parent, child, and sibling, and the explanation for why these emotions were expressed in these social triangles was assumed to be due to the child's jealousy.

Coping with the Emotional Experience of Jealousy

How do individuals cope with jealousy and regulate the emotional reaction? Based on Lazarus's (Lazarus & Folkman, 1984) cognitive–transactional theory of stress and coping, White and Mullen (1989) offered several possible coping responses that individuals may use once they have appraised the threat of a rival relationship. Examples included attempts to improve one's primary relationship, interference with the rival relationship, seeking support from others, derogating the beloved or the rival, developing alternative sources of pleasure, or avoidance of the social situation. Several of these regulatory strategies bear little resemblance to those coded frequently in current developmental research examining the self-regulation of infants, toddlers, or preschoolers (e.g., Buss & Goldsmith, 1998; Calkins & Johnson, 1998). Jealousy, however, is a social emotion. Therefore, the repertoire of regulatory strategies coded for toddlers and preschoolers in jealousy situations must include how these young children cope by altering the constellation of social relationships giving rise to the jealous emotional experience. The current research focused on three possible behavioral coping strategies that might be used by toddler and preschool siblings when confronted with jealousy: (1) attempts to interfere with the interaction between the sibling and the parent, (2) directing hostility toward either parent or sibling, and (3) focusing attention on alternative pleasurable activities (i.e., play).

Can Young Children Experience Jealousy?

Is there empirical evidence to suggest that young children respond to the loss of a formative relationship with a beloved? Several lines of research indicate that very young children are sensitive to the loss of parental attention to another. First, Dunn (Dunn, 1988; Dunn & Kendrick, 1982) has reported that toddler and preschool children were very attuned to the interactions occurring between their parents and their sibling and would often try to disrupt the ongoing interaction. Second, the few extant studies that addressed childhood jealousy have documented that children as young as 1 year of age were sensitive to maternal attention directed toward an infant-size doll (Hart, Field, DelValle, & Letourneau, 1998; Hart, Field, Letourneau, & DelValle, 1998), a newborn infant (Case, Hayward, Lewis, & Hurst, 1988), or an unfamiliar peer (Case et al., 1988; Masciuch & Kienapple, 1993). It appears, then, that even infants and young children are sensitive to the loss of attention from parents to another, whether this loss is experienced in relation to a doll, a peer, or a sibling.

Sibling Jealousy in Early Childhood

Sibling jealousy has been described by Parrott (1991, p. 17) as the "most powerful jealousy of youth" and the parent–child relationship that is threatened by a sibling rival is the most important and formative relationship of a young child's early life. Adults have actually used terms such as "total rage," "ferocious," and "outrageous" to describe their jealousy reactions upon learning of the betrayal of a romantic partner

(Bernhard, 1986); yet, little is known about the intensity of jealousy between young siblings. What is known is that parents cannot attend and respond to both children's needs at all times. Thus, intense jealousy could very well be a normal, perhaps daily, experience for these young children.

In an earlier article (Miller, Volling, & McElwain, 2000), we reported on the development and validation of a laboratory-based, observational protocol designed to elicit jealousy reactions in young toddler and preschool siblings. During observations of social triangles involving the mother and the siblings, and the father and the siblings, we found that both older and younger siblings were more likely to express jealousy (i.e., sadness and distress) during sessions in which the parent's attention was directed toward the sibling than when the parent was interacting with the child. Further, there were developmental differences in the older and younger siblings' jealousy responses, with older children much less likely to show negative affect and better able to focus attention and play during the jealousy paradigm. This earlier study also examined consistent individual differences in parent and child behaviors across siblings; the associations between parent behaviors and child behaviors within the jealousy session; and finally, differences in how mothers and fathers responded to jealousy with older and younger siblings.

The current work extended this earlier research in several ways. First, the intercorrelations between children's expressed emotion and their behavioral coping were examined within the jealousy triangle in an effort to determine whether affect and behavior were organized in line with the notion of a jealousy complex. Second, children's jealousy responses were addressed with mothers and fathers to ascertain whether there was consistency across social triangles with respect to children's jealousy or whether these responses were sensitive to, and therefore, specific to a given social triangle. Third, family and child correlates of young children's jealousy reactions were examined. Specifically, this study addressed whether children's emotional understanding, negative emotionality, their attachment relationships to mother and father, parenting behavior, and the quality of marital and sibling relationships predicted both the older and younger siblings' jealousy with mothers and fathers.

METHOD

Participants

Study participants included mothers, fathers, and sibling pairs from 60 maritally intact families who were participating in a short-term longitudinal study of parent–child and sibling relationships in infancy and early childhood. Families were initially recruited from birth announcements, local day-care centers, and through referrals from participating families. Families were required to meet three criteria to be eligible for the study: (1) intact marital status; (2) participation from both mothers and fathers; and (3) at least two children in the family, with the youngest child nearing 12 months of age and the older sibling between the ages of 2 and 6 years. Of the total families meeting study criteria, 69% agreed to participate. All parents were the biological mothers and fathers of the two children. Participating families were primarily European American ($n = 56$), with one Native American couple and three interracial couples. Parents had been married for an average of 7 years (*range* = 3–16 years). On average, fathers were 35.6 years old and had completed 17.4 years of education, whereas mothers were, on average, 33.2 years old and had completed 16.5 years of education. The mean family income was $73,607 ($SD$ = $41,791). The age of the younger sibling (toddler) in all families was 16 months at the time of the third visit the mean age of the older sibling was 50 months (*range* = 2–6 years), and the average age space between siblings was 35 months (*range* = 11–68 months). Most of the toddlers in the study ($n = 44$) were second-born; the remaining 16 toddlers were third- through fifth-born. For families with more than two children, the older sibling closest in age to the 16-month-old was asked to participate. The sample included 20 girl/girl dyads (younger/older), 14 boy/boy dyads, 10 girl/boy dyads, and 16 boy/girl dyads.

Procedures

Families were invited to participate in laboratory visits when the younger sibling was 12, 13, and 16 months of age. The 12- and 13-month visits were counterbalanced assessments of mother–infant and father–infant interaction and will be referred to as 12/13 month visits throughout. Data for the current report are from the triadic interactions involving parents and siblings completed during the 16-month visit. The 16-month laboratory visit was approximately 90 min and included (1) a puppet interview with the older sibling; (2) 15 min of family free play involving mother, father, and the two siblings; (3) a 10-min sibling free-play session during which parents completed questionnaires at a nearby table; (4) triadic interaction with first parent (9 min); (5) triadic interaction with second parent (9 min); (6) a separation (5 min), (7) a 3-min reunion with the entire family; and (8) a 5-min family cleanup. All

sessions were videotaped in the laboratory with the use of wall-mounted cameras and split-screen capability. Mothers and fathers were also asked to complete a series of questionnaires to assess the marital relationship and children's temperament (at 12/13 months), as well as sibling relationship quality (at 16 months). At 12/13 months, mothers and fathers completed the Attachment Q-Set (AQS; Waters & Deane, 1985) for older siblings and the Strange Situation was conducted to assess infant–mother and infant–father attachments for the younger sibling. Finally, the older siblings' emotional understanding was assessed during the puppet interview at the 16-month visit.

Observations of Social Triangles

At the 16-month visit, siblings were videotaped in a triadic interaction paradigm (once with mother and once with father) similar to one developed by Teti and Ablard (1989). Parents were given an attractive toy (a Lego™ playset or a talking phone) to use during the interaction sessions (order of the mother and father sessions was counterbalanced). Family triads were videotaped in three 3-min sessions. In the first 3-min session, the parent was instructed to focus on one child (either the older sibling or the toddler, determined by counterbalancing) while encouraging the other child to play with other toys in the room. Parents were instructed to interact with their children as they would at home if a new toy were brought into the house (e.g., a birthday gift). For the second, 3-min session, parents switched their involvement and played with the other child, while the first child was instructed to play with other toys in the room. After this 3-min session, the parent was instructed to play with both children in any way he or she chose. This third session was viewed as a transitional period between the mother and father sessions and was intended to alleviate any distress that may have been elicited during the jealousy sessions. Toddler jealousy was the focus during the sessions in which the parent was involved with the older sibling, whereas older sibling jealousy was the focus during parent–toddler interaction sessions. Only child behavior and emotions observed during these sessions were of interest to this investigation.

This triadic paradigm reliably elicits jealousy reactions in young children (Miller et al., 2000). Mean differences as a function of sibling, parent, and context (challenged versus involved) along with cross-sibling correlations and correlations between sibling and parent behavior using the triadic observational paradigm with the current sample can be found in our earlier article (Miller et al., 2000).

Observational coding of emotional displays and behavior. Videotapes of the triadic sessions were coded using global ratings for the toddlers' and older siblings' emotional displays and 15-s interval sampling for the children's behavioral coping strategies and parent behavior. Global rating scales of emotional displays were used to represent the emotional dynamics (i.e., intensity and duration), as well as the emotional meaning of the interaction (Bakeman & Gottman, 1997; Sroufe, 1996; Thompson, 1994). Interval coding was used for behavioral coding because others have noted that these coding schemes are best for capturing discrete behaviors (e.g., Isabella & Belsky, 1991). Independent raters ($n = 7$) assessed toddlers and older children in the same session, and the same child across sessions with mothers and fathers. Behaviors and emotions were coded by the same coder, but during separate passes through the videotape. Coders were trained on a subsample of tapes until interobserver agreement was 80% or higher. Reliability for parent and child codes was calculated on approximately 20% of mother and father sessions. Cohen's κ coefficients are reported below after the description of the codes. Weighted κ coefficients were used to calculate reliability for the global scales, because these are considered more appropriate for assessing the reliability of rating scales (Bakeman & Gottman, 1997).

Global emotional displays. Children's emotional displays were rated globally during each 3-min segment and captured affective expressions indicating jealousy reactions (e.g., anger, fear, and sadness). The emotional display codes were adapted from previous work by Cole and colleagues (Cole, Barrett, & Zahn-Waxler, 1992; Cole, Zahn-Waxler, & Smith, 1994). Each emotion was coded on a 7-point scale, ranging from 0 (no display of emotion during segment) to 6 (frequent and full displays of emotion during segment). The global rating took into consideration the intensity, as well as the frequency and duration, of emotional displays during the entire 3-min segment. Facial expression and vocal tone were considered when rating global sadness (e.g., turned-down facial expression, whining voice, and slackening of muscular tone in face or body; weighted $\kappa = .82$), anger (e.g., hostility, annoyance, and harsh tone of voice; weighted $\kappa = .77$), and fear/anxiety (e.g., nervousness, fearfulness, and constricted strain in voice; $\kappa = .47$) for older siblings. Because fear/anxiety for the older sibling was coded infrequently and the reliability for this code was low, it was dropped from analyses.

Global ratings of toddlers' distress (e.g., fussing, whining, and crying; weighted $\kappa = .72$) were also coded on a 7-point scale. Toddlers' negative affect

was limited to this more encompassing "distress" code because it is often difficult to distinguish among anger, fear, and sadness in infant distress reactions (Sroufe, 1996). Young children can experience distress for a number of reasons other than jealousy. In the present study, toddler distress was not coded as a jealousy response if it occurred in response to parental prohibitions in other parts of the room (e.g., parent retrieves wandering toddler from climbing on chair), frustration with an object (e.g., toddler is unable to open cabinet door), or pain (e.g., toddler stands up and bumps head on table). Distress was coded as a jealousy response when it was directed at the parent–sibling interaction (e.g., trying to get toy from sibling, pushing self into parent's lap, parent prohibiting toddler from playing with new toy). As a result, we were fairly confident that the toddler's distress was due more to jealousy than to the other possible sources of distress reactions listed above.

Child behavioral coping. Child and toddler behaviors were coded for each 15-s interval of the 3-min session as a means of assessing coping behaviors. Older siblings' and toddlers' behaviors were coded for the presence or absence of distracting the parent and/or sibling from their activity (e.g., placing self between parent and sibling; $\kappa = .82$). As a means of assessing the children's ability to regulate their emotions in this context and focus on an alternate pleasurable activity, the older children's and toddlers' play involvement was coded, weighted $\kappa = .87$ for older sibling and .84 for younger sibling. This captured the extent to which the challenged child was able to focus his or her attention on an alternative activity and play with other toys in the room. Play involvement was coded on a 3-point scale, ranging from 1 (uninvolved in play by self) to 3 (fully involved with a toy or an activity by self). Mean scores were created for each child behavior by summing across intervals and dividing by the number of 15-s intervals coded during the session.

Disruptive behavior was captured by three codes: negativity toward parent, negativity toward sibling (e.g., hitting, pushing), and rough play (e.g., banging toy in an aggressive or inappropriate manner). Each was coded as present or absent during each of the 15-s intervals and a composite of the older siblings' hostile behavior was created by summing across all three categories, $\kappa = .60$. Negativity toward parent and sibling, as well as rough play, rarely occurred for the younger toddlers and these were not considered further.

Parent behavior. To provide a stringent test of the unique effect of child and family characteristics on sibling jealousy, it was necessary to control for parent behavior observed during the triadic interaction. The presence or absence of three parenting behaviors was coded using 15-s interval sampling to assess the parents' behavior in response to the children's bids for attention during the jealousy paradigm. Parent codes were based on the work of Belsky, Youngblade, Rovine, and Volling (1991) and included facilitative (e.g., uses reasoning; maintains warm, nurturing tone of voice), controlling (e.g., uses commands, harsh tone of voice), and unresponsive (e.g., ignores child's bids) behaviors. Interobserver agreement averaged 96%, Cohen's $\kappa = .83$, for parent behavior codes. A proportion score was created for each parenting behavior in which the sum of that behavior (e.g., facilitative) was divided by total parenting behavior (facilitative + controlling + unresponsive) observed during the triadic session. Parents were more likely to use facilitative behavior than controlling or unresponsive behavior in response to their children's bids for attention (see Miller et al., 2000). Therefore, only facilitative behavior was included as the parental control variable in subsequent multivariate analyses.

Measures of Emotionality, Emotion Understanding, and Family Relationship Functioning

Evaluation of the sibling relationship. To assess the older sibling's behavior, mothers and fathers completed 49 items of a modified version of the Sibling Inventory of Behavior (SIB; Schaefer & Edgerton, 1981) developed by Hetherington and Clingempeel (1992), which has six sibling relationship scales: involvement, empathy, rivalry, avoidance, aggression, and teaching. Each item was answered using a 5-point Likert scale, ranging from 1 (never) to 5 (always). A 15-item positive involvement scale consisting of the sum of teaching, empathy, and involvement, $\alpha = .84$ and .85 for mothers and fathers, respectively (e.g., "treats younger sibling as a good friend") and a 12-item aggressive rivalry scale consisting of the sum of rivalry and aggression, $\alpha = .91$ for both mothers and fathers (e.g., "is very competitive with younger sibling") were created. The five-item avoidance scale was dropped because the internal consistency for one of the scales was low, $\alpha = .43$ and .69 for mothers and fathers, respectively. Because many of the items on the original SIB were inappropriate for a 16-month-old toddler (e.g., "makes plans that include the older sibling"; "babysits the older sibling"), parents completed only 13 items from the SIB and an additional 18 items from the Sibling Relationships in Early Childhood questionnaire (Volling, 1997; Volling & Elins, 1998). Each item was answered on a 5-point Likert scale from 1 (never) to 5 (always). Intercorrelations between these items were examined and revealed two internally consistent dimensions for the younger

siblings' behavior that corresponded closely to the two scales used for the older siblings: (1) an eight-item positive involvement scale, $\alpha = .86$ and .76 for mothers and fathers, respectively (e.g., "has fun or a good time with sibling"); and (2) a seven-item conflict/rivalry scale, $\alpha = .73$ and .61 (e.g., "has physical fights with older sibling, not just for fun").

Correlations between mothers' and fathers' reports were fairly low for the younger siblings, average cross-parent $r = .20$, and moderate for the older siblings, average cross-parent $r = .45$. Dynamics within the social triangles with mothers and fathers might be very different given that mothers and fathers may favor or treat the two children differently (Volling & Elins, 1998). The individual parent's perceptions of sibling behavior may be a better predictor of the children's jealousy within a specific social triangle involving either the mother or the father. Therefore, mothers' reports to predict the siblings' jealousy in mother sessions and fathers' reports to predict the children's jealousy in the father sessions were used.

Assessment of the marital relationship. Husbands and wives completed the Intimate Relations Scale (Braiker & Kelley, 1979). This 25-item questionnaire assessed four interpersonal aspects of the marital relationship: (1) maintenance (five items)—the extent to which spouses attempted to enrich, improve, and maintain their relationship, $\alpha = .78$ and .75 for wives and husbands, respectively; (2) conflict (five items)—the extent to which couples engaged in marital disputes, $\alpha = .79$ and .86; (3) love (10 items)—the extent to which spouses reported feelings of love for one another, $\alpha = .92$ and .93; and (4) ambivalence (five items)—the extent to which spouses reported ambivalent feelings about their relationship, $\alpha = .87$ and .67. Items were answered on a 9-point Likert scale ranging from 1 (very little or not at all) to 9 (very much or extremely). Because of the significant intercorrelations between marital scales, husbands' and wives' reports were first standardized and then two composites were formed: (1) positive marital relations, which was the sum of marital love and maintenance, rs = .52 for mothers and .56 for fathers, $p < .001$; and (2) negative marital relations, which was the sum of marital conflict and feelings of ambivalence, rs = .57 for mothers and .71 for fathers, $p < .001$. Given that husbands' and wives' composites were highly intercorrelated, $r = .52$ for positive marriage and $r = .75$ for negative marriage, $p < .001$, husbands' and wives' scores were averaged to create global composites of positive and negative marital relationship quality.

Preschooler's attachment to mothers and fathers. The AQS (Waters & Deane, 1985) was completed by mothers and fathers to assess the attachment relationship between each parent and the older sibling. Mothers and fathers each received materials and detailed instructions for the AQS during the 12/13-month visits. The AQS consists of 90 cards, with each card describing a young child's behavior in the home (e.g., easily comforted by adult; explores objects thoroughly). Parents were instructed to read through all the cards, then put the sorting task away for a week and watch their child at home. After 1 week, parents sorted the 90 cards into nine piles (10 cards each) ranging from "least characteristic" to "most characteristic" of their child. Teti and McGourty (1996) have recently shown mothers' AQS assessments were significantly correlated with AQS assessments conducted by "blind" observers and concluded that mothers should be preferred raters for the AQS because they observe a broader, more representative sample of children's behavior in the home. Although fathers' AQS assessments were not examined by Teti and McGourty (1996), we argue that fathers should also be viewed as preferred raters given their frequent interaction with their children in the home. Scores of attachment security for the older siblings were calculated by correlating mothers' and fathers' sorts with a criterion sort representing the hypothetically "most secure" child. Higher scores indicate a closer fit to the criterion sort for a securely attached child. For purposes of data analyses, Fisher's r-to-z transformation was used to transform the correlation coefficients. Three mothers and four fathers did not return the AQS, and therefore, these families' data were missing for analyses examining the older siblings' attachment security ($n = 57$ and 56, respectively). Mothers' and fathers' scores were uncorrelated, $r = -.01$.

Infant–parent attachment. Infants were observed at 12 and 13 months of age (counterbalanced across parents) in the Strange Situation following procedures outlined by Ainsworth, Blehar, Waters, and Wall (1978). The Strange Situation is a standardized procedure consisting of seven, 3-min episodes in which infants are exposed to increasing levels of stress in an effort to examine whether they use the parent as a secure base to explore and rely on the parent to provide comfort. On the basis of the infants' exploratory behavior, their orientation to the stranger and their behavior on reunion with the parent, infant–parent relationships are classified into three types of attachment: Infants who greet the parent positively on reunion, approach the parent, and find comfort in contact with the parent when distressed are classified as securely attached; infants who turn away from the parent on reunion or avoid interaction are classified as insecure–avoidant; and infants who have difficulty being comforted by the parent on reunion and

who both seek and resist contact with the parent are classified as insecure–resistant/ambivalent. All Strange Situations were videotaped and subsequently coded as insecure–avoidant (A), secure (B), or insecure–resistant (C), according to the classification system of Ainsworth et al. (1978). Videotapes were scored by three coders who had achieved acceptable reliability with a coding tape provided by L. Alan Sroufe prior to coding. Interrater reliability among the three coders was 84%, $\kappa = .76$. Disagreements on classifications were resolved by consensus.

Of the 60 father–infant dyads classified, 20% were insecure–avoidant ($n = 12$), 58.3% were secure ($n = 35$), and 21.7% were insecure–resistant ($n = 13$). For the mother–infant dyads, 15.3% were classified as insecure–avoidant ($n = 9$), 69.4% as secure ($n = 41$), and 15.3% as insecure–resistant ($n = 9$). Because of video equipment problems, Strange Situation data were missing for 1 of the mother–infant dyads. Two attachment groups were created by collapsing the avoidant and resistant classifications into one insecure group and comparing it with the secure group.

Emotion understanding of older sibling. Older siblings' understanding of emotions was assessed using Denham's (1986) puppet interview at the 16-month visit. Children were introduced to a puppet of the same gender and shown four faces (happy, sad, angry, and scared) that could be affixed to the puppet's face. Children were first asked to label each expression ("How does Jenny/Johnny feel when she/he wears this face?") and point to the face that matched the label provided by the interviewer ("Show me a face where Jenny/Johnny feels happy"). Children were then presented with 15 vignettes depicting emotional reactions to different situations and asked to choose the face that matched the story character's emotion ("Can you find the face that shows how Jenny/Johnny feels?"). In eight vignettes, the story character's emotional reaction was typical for the given situation (e.g., being scared after having a bad dream); whereas in seven nontypical vignettes, the emotional reaction was more equivocal. Prior to the interview, parents had been asked how their child would most likely feel in these nontypical situations (e.g., scared of a big dog) and a different emotional reaction was presented to the child during the interview (e.g., happy to see a big dog). Children's responses to each of the 15 vignettes were coded according to procedures used by Denham (1986) wherein children received 2 points for the correct identification of an emotion (e.g., picking an angry face when the target emotion was anger), 1 point for correct valence (e.g., picking a sad face when the target emotion was scared), and 0 for incorrect valence (e.g., choosing a happy face when the target emotion was anger) or no response.

Because many of the youngest children did not respond to all vignettes, missing data were not randomly distributed within the sample. A simple sum of scores across the 15 vignettes would mean the younger children would be excluded from all analyses and the results would only be representative of the older children in the sample who had scores on all 15 vignettes. Further, because the nontypical vignettes required parents to tell the experimenter which emotion the child might display in a particular situation, children were often being tested on different emotions during the last seven vignettes (e.g., some parents claimed the child would be scared in response to a big dog, whereas others claimed the child would be happy). Therefore, we composited across the vignettes in a manner that allowed the youngest children to be included in the analyses and also took into consideration the number of times a child was tested on a specific emotion. An emotion understanding score was computed by first averaging responses across each individual emotion (i.e., happy, sad, angry, and scared), yielding four scores ranging from 0 to 2. These four scores were then summed to create a total score, ranging from 0 to 8. One child refused to participate in the interview; thus, data were available for 59 children.

Temperament. The Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996) was given to both mothers and fathers at the 12/13 month visits to be completed for the older siblings, and the IBQ (Rothbart, 1981) was completed by mothers and fathers at 12/13 months for the younger siblings. The TBAQ subscales included activity level, social fear, anger proneness, tendency to express pleasure, and interest/persistence; whereas the IBQ subscales included activity level, smiling and laughter, distress and latency to approach sudden or novel stimuli, distress to limitations, soothability, and duration of orienting. Parents rated how often their child performed certain behaviors using a 7-point scale (1 = never; 7 = always), and mean scores were calculated across subscale items. The IBQ and TBAQ were developed as parallel temperament measures for younger and older children, and have good convergent and discriminant validity (Goldsmith, Rieser-Danner, & Briggs, 1991). Prior research has found greater conflict and rivalry between siblings high on negative emotionality (e.g., Stoneman & Brody, 1993). Therefore, only the anger proneness scale from the TBAQ for older siblings and the distress to limitations scale from the IBQ for younger siblings were chosen to be included in the analyses. Internal consistency for these two subscales were anger prone-

ness: father = .92, mother = .85; and distress to limitations: father = .82, mother = .84. Correlations between mothers' and fathers' reports of temperament revealed moderate associations (older siblings' proneness to anger, $r = .37$, $p < .01$; younger siblings' distress to limitations, $r = .26$, $p < .05$. To increase construct validity (Rushton, Brainerd, & Pressley, 1983), mothers' and fathers' reports were averaged to create one score for each child and are referred to as temperamental anger throughout the remainder of this article.

The intercorrelations, means, and standard deviations for all independent variables are presented in Table 1 for descriptive purposes only and will not be discussed further.

RESULTS

In an effort to address the coherence of emotional expression and behavior elicited in the triadic paradigm, intercorrelations between emotional expressions and behavioral coping strategies were examined. Based on these intercorrelations, composites of emotional expression (i.e., jealous affect) and behavioral dysregulation were created. Next, analyses addressed whether the emotional and behavioral composites differed as a function of family structure variables (e.g., age spacing, gender, and birth order), as well as a function of the order of counterbalancing during the laboratory visits. Correlations between these composites of jealous affect and behavioral regulation were conducted and related to facilitative parenting behavior, child characteristics, and family characteristics. Finally, hierarchical multiple regression models were developed to test the unique and combined influence of family and child characteristics in predicting jealousy responses.

Intercorrelations of Jealous Emotions and Behavior

To address whether emotions and behaviors cohered in a manner consistent with the notion of a jealousy complex, correlations between emotional expressions and behavioral coping were conducted. Tables 2 and 3 show the intercorrelations among children's emotional expressions and coping behaviors in the jealousy paradigm. As expected, there were significant relations between the children's emotional expressions and their behavioral coping. For older siblings, a general pattern indicated that anger, sadness, distraction, and hostile behavior were positively intercorrelated within mother and father sessions and that all of these were negatively correlated with the older sibling's ability to focus on play activities (see Table 2). A similar pattern of intercorrelations was evident for the toddler sessions with mother and father: distress and distraction were positively related within mother and father sessions, but negatively correlated with toddlers' ability to remain involved in play (see Table 3). Although there were fairly robust and consistent patterns of intercorrelations within the mother and father sessions for both the preschool and toddler siblings, it is striking that few significant associations were revealed when the children's behavior across mother and father sessions were correlated. Correlations down the diagonals of Tables 2 and 3 indicate the associations between the children's (older sibling or toddler) jealousy reactions with mother and jealousy reactions with father. With the exception of the older siblings' distracting behavior, there was little indication that children's jealousy reactions were similar across mother and father sessions.

Based on these intercorrelations, two composites were created for both the older siblings and the younger toddlers. One reflected a composite of jealous affect and consisted of standardizing and summing sadness and anger for the older children and using only the distress variable for the younger children. The second composite reflected behavioral dysregulation and included for the older siblings, standardizing and summing hostility and distraction, and then subtracting play involvement. For the toddlers, this included subtracting play involvement from distraction. Emotions and behaviors were composited separately as a means of assessing the children's emotional reactivity and behavioral regulation given that several researchers have proposed that emotional reactivity and regulation of that reactivity are distinct constructs that can operate independently (Braungart-Rieker & Stifter, 1996; Eisenberg & Fabes, 1992; Rothbart & Derryberry, 1981). Even though reactivity and regulation may be distinct, there can be an association between them, as there was in this case, $r = .53$ for older and .54 for younger siblings' jealous affect and behavioral dysregulation with mothers; $r = .57$ for older and .58 for younger siblings' jealous affect and behavioral dysregulation with fathers, $p < .001$. Correlations between the older and younger siblings' composites were conducted across mother and father sessions and revealed that for older siblings, the more global composites of behavioral dysregulation, $r = .29$, $p < .05$, and jealous affect, $r = .27$, $p < .05$, were moderately related across mother and father sessions, although this was not the case for the toddlers' behavioral dysregulation, $r = -.00$, or jealous affect, $r = .06$ from Table 3.

Family Structure and Order Analyses

One-way ANOVAs and correlations were conducted to examine whether the dependent variables

Table 1 Intercorrelations and Descriptive Statistics of Child and Family Characteristics

	1	2	3	4	5	6	7	8	9	10	11	12
1. OS EU		−.30*	.12	−.12	.33*	−.12	−.07	−.18	.18	−.17	−.07	−.19
2. Temperament		**.03**	−.38**	.26*	−.34**	.42**	−.03	.24	−.28*	−.14	−.05	.17
3. Sib pos (M)		.09	**.59*****	−.29*	.65***	−.53***	.08	−.19	.03	.30*	.04	−.01
4. Sib rival (M)		.16	−.07	**.42****	−.30*	.47***	.15	.04	.08	−.03	−.05	.13
5. Sib pos (F)		−.06	.45***	−.06	**.59*****	−.49***	.25	−.32*	.14	.16	−.01	−.29*
6. Sib rival (F)		.12	−.16	.28*	−.24	**.47*****	.01	.21	.07	−.34*	−.11	.18
7. Pos marriage		.09	.23	.06	.13	−.06	—	−.49***	−.03	.16	−.18	−.27*
8. Neg marriage		.17	−.20	.05	−.20	.19	−.49***	—	−.08	−.26	.03	.16
9. Attach (M)		−.02	−.09	.03	−.16	.16	−.15	.11	**−.19**	.03	−.09	.02
10. Attach (F)		−.06	.00	.19	.04	−.11	.01	.00	.28*	**−.12**	−.03	−.05
11. Facilitate (M)		−.15	.07	.06	−.04	.08	.15	−.15	−.09	−.01	**.10**	.03
12. Facilitate (F)		−.07	.15	−.03	.10	.18	−.13	−.08	.14	−.07	.23	**.09**
M (*SD*) OS measures	6.24 (2.11)	3.59 (.69)	50.65 (8.30)	31.59 (6.29)	48.93 (8.49)	30.87 (6.37)	103.35 (12.27)	35.00 (11.85)	−.02 (1.00)	.03 (.98)	.76 (.24)	.73 (.21)
M (*SD*) YS measures	—	3.90 (.60)	28.70 (4.70)	15.51 (3.51)	27.68 (3.89)	14.12 (3.16)	—	—	.69 (.46)	.58 (.50)	.68 (.36)	.61 (.37)

Note: OS = older sibling; EU = emotion understanding; Sib pos = sibling positive involvement; M = mothers' reports; Sib rival = sibling rivalry; F = fathers' reports; Pos marriage = positive marriage; Neg marriage = negative marriage; Attach = attachment security; Facilitate = parental facilitative behavior during triadic challenge sessions (proportion scores); YS = younger sibling. Correlations above the diagonal are for the older sibling and correlations below the diagonal are for the younger sibling. Correlations between older and younger sibling measures (when applicable) are boldfaced and presented in the diagonal. Because the measures of the marital relationship were the same for both children, the correlations between these measures are reported twice. Emotion understanding was assessed for the older sibling only.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 2 Intercorrelations among Older Siblings' Emotions and Behaviors in Mother and Father Sessions

	Anger	Sadness	Distract	Hostility	Play
Anger	**.14**	.66**	.18	.62**	−.24
Sadness	.46**	**.20**	.35**	.60**	−.39**
Distract	.28*	.41**	**.33***	.39**	−.69**
Hostility	.62**	.28*	.26*	**.23**	−.45**
Play	−.41**	−.32*	−.74**	−.37**	**.13**

Note: Correlations for triadic session with mother are presented in the upper diagonal; correlations for triadic session with father are presented in the lower diagonal. Correlations between older siblings' emotions and behaviors across sessions with mothers and fathers are boldfaced and presented in the diagonal.
* $p < .05$; ** $p < .01$.

Table 3 Intercorrelations among Younger Siblings' Emotions and Behaviors in Mother and Father Sessions

	Distress	Distract	Play
Distress	**.06**	.47**	−.55**
Distract	.60**	**−.25**	−.78**
Play	−.46**	−.70**	**−.12**

Note: Correlations for triadic session with mother are presented in the upper diagonal; correlations for triadic session with father are presented in the lower diagonal. Correlations between toddlers' emotions and behaviors across sessions with mothers and fathers are boldfaced and presented in the diagonal.
** $p < .01$.

of jealous affect and behavioral dysregulation differed as a function of the older siblings' age, age space, birth order, and gender composition of the sibling dyad. Age of the older siblings and the age space between siblings was negatively correlated with the older siblings' jealous affect in mother sessions, *r*s = −.29 for both. One-way ANOVAs examining the gender of the older and younger siblings, as well as the gender composition of the dyad, were all nonsignificant. Thus, gender was not considered further. There were also no birth order effects. Because the age of the younger siblings was the same in all families (i.e., 16 months), the age of the older children and the age space between children provided virtually identical information given that there would be wider age spaces for those dyads in which the older siblings were older. In the multivariate regression analyses that follow, age space between siblings was used as the control variable, rather than including both variables in the models.

One-way ANOVAs examining order effects of counterbalancing (i.e., which child was challenged first) revealed order effects for toddler jealous affect, $F(1, 57) = 4.35$, $p < .05$, and behavioral dysregulation for mother sessions, $F(1, 57) = 21.18$, $p < .001$; and order effects for toddler jealous affect, $F(1,58) = 6.93$, $p < .05$, and behavioral dysregulation, $F(1, 58) = 13.44$, $p < .001$, in father sessions. Order effects were also found for the older siblings' behavioral dysregulation, $F(1, 58) = 5.26$, $p < .05$, in father sessions. Toddlers were more distressed ($M = 2.45$) and dysregulated ($M = .99$) when they were challenged first than when they were challenged second (*M*s = 1.40 and −.96 for distress and dysregulation, respectively) with their mothers. Similarly, toddlers were more distressed ($M = 2.0$) and dysregulated ($M = .79$) when challenged first than when challenged second (*M*s = .80 and −.79 for distress and dysregulation, respectively) with their fathers. Older siblings were more dysregulated with fathers when they were challenged second rather than first (*M*s = .68 and −.68). It appears, then, that the contextual manipulation of the jealousy paradigm results in different jealousy reactions for older and younger siblings, at least with fathers. Thus, session order and age of the older sibling were controlled when examining the relations with child and family characteristics in the correlational analyses below.

Family and Child Correlates of Jealousy and Dysregulation

To address the family and child correlates of children's jealous affect and behavioral dysregulation, partial correlations were conducted between the two composites and parents' reports of family relationship quality, children's temperamental anger, the older siblings' emotional understanding, and parents' facilitative behavior during the observational sessions (Table 4). Older siblings with higher emotional understanding scores were less likely to express jealous affect and behavioral dysregulation in the social triangle with mothers. Older siblings were also more behaviorally dysregulated in the mother sessions when parents reported that older siblings were more temperamentally prone to anger, marriages were less positive and more negative, and older siblings had less secure attachments to their mothers. Not one of the sibling behavior scales was significantly correlated with older siblings' behavioral dysregulation or jealous affect with mothers. Jealous affect expressed by older siblings in the social triangles with fathers, however, was positively related to sibling rivalry. Older siblings' behavioral dysregulation was significantly associated with temperamental anger, sibling rivalry, and a less secure attachment to the father.

Table 4 Correlates of Older and Younger Siblings' Jealous Affect and Behavioral Dysregulation

	Mother Session		Father Session	
	Jealous Affect	Behavioral Dysregulation	Jealous Affect	Behavioral Dysregulation
Older sibling				
Emotion understanding	−.35**	−.27*	.02	−.12
Temperamental anger	.22	.31*	.09	.26*
Sibling positive interaction	−.02	−.22	−.06	−.13
Sibling rivalry	.16	−.02	.30*	.27*
Positive marriage	.06	−.34**	.20	−.12
Negative marriage	.21	.31*	.16	.25
Attachment security	−.05	−.31*	−.12	−.27*
Facilitative parenting	−.18	−.03	−.12	−.12
Younger sibling				
Temperamental anger	.29*	−.06	.08	.09
Sibling positive interaction	−.10	.11	−.02	.04
Sibling rivalry	.20	.35**	.15	.09
Positive marriage	.24	.21	.04	−.10
Negative marriage	.09	−.07	.07	.10
Attachment security	.01	.02	.13	.10
Facilitative parenting	.11	.20	.06	.31*

Note: Partial correlations for older siblings controlled for older sibling age and order of sessions. Partial correlations for younger siblings controlled for order of sessions. Average scores across mothers' and fathers' reports were utilized for marriage and temperament, whereas separate measures for mothers' and fathers' reports were utilized for sibling interaction, attachment, and facilitative parenting. Younger sibling attachment was coded as 0 = insecure, 1 = secure.
* $p \leq .05$; ** $p \leq .01$.

For the younger toddlers, jealous affect in the mother sessions was significantly related to parents' reports of temperamental anger (see Table 4). The toddlers' behavioral dysregulation in mother sessions was also positively correlated with mothers' reports of sibling rivalry, but to no other family characteristic. Dysregulated toddler behavior in father sessions was positively related to fathers' facilitative behavior during interaction. Fathers were responding with more facilitative behavior to the bids of the more behaviorally dysregulated toddler.

Multiple Prediction of Jealous Affect and Behavioral Dysregulation

The final analyses addressed whether children's jealous affect and behavioral dysregulation could be uniquely predicted by family and child characteristics, controlling for age space, session order, and facilitative parent behavior directed toward the child during the jealousy sessions. For each hierarchical multiple regression model tested, the age space between siblings, session order, and parents' facilitative behavior were entered in the first step. Child characteristics (i.e., temperament, emotion understanding) were then entered in the second step. Family indicators (marriage, sibling, attachment security) were then entered in the third step. Although the attachment security score could easily be entered as a single variable in the final step, composites of positive sibling relationship quality and positive marital relationship quality were created by subtracting the negative dimension from the positive dimension for both the marital and sibling relationships. Each composite score was then entered as a single variable in the final step of the regressions. This strategy allowed for the ability to run identical regression models for both siblings across both parents so that the strength of family and child characteristics in predicting jealousy could be compared across siblings.

The regression analyses for the older siblings' jealousy in mother and father sessions is summarized in Table 5. Beta coefficients reported in Step 3 are those from the final regression when all variables were entered into the model. In the regression examining the older siblings' jealous affect with mothers, a significant 33% of the total variance was explained. The older children's temperamental anger and emotion understanding accounted for a significant 19% of the variance over the age space, session order, and parent behavior when entered in Step 2. Family characteristics did not account for any additional variance in the

children's jealous affect when entered in the final step. Only the older siblings' emotion understanding remained significant in the final equation when family characteristics were entered in the third step.

An examination of the regression results using the older siblings' behavioral dysregulation with mothers as the criterion revealed that 32% of the variance was explained in the final model. Once child characteristics were entered in the second step of the regression, 12% of the variance had been accounted for by these variables. Family relationship functioning accounted for a significant 14% of the variance in the older children's behavioral dysregulation with mothers when entered in the third step. As Table 5 indicates, however, only session order and the positive quality of the marital relationship were significant predictors of the older siblings' behavioral dysregulation in the mother sessions above age space, session order, parent behavior, and child characteristics in the final regression. Children were better at regulating their jealousy when parents reported more positive marital relationships. Attachment security with mothers revealed a marginal association with the children's behavioral dysregulation, with more securely attached children displaying less dysregulated behavior.

In the case of the older siblings' jealous affect in the father sessions, Table 5 indicates that none of the variables considered, including child and family characteristics, predicted the older siblings' jealous affect with fathers. For the older siblings' behavioral dysregulation with fathers, session order was the only unique predictor in the final regression model, yet the R^2 for the final model was only marginally significant.

Table 6 summarizes the regression findings that examined the younger siblings' jealousy reactions in both the mother and father sessions. Looking at the results from the final regression predicting the children's jealous affect with mothers, a significant 25% of the variance was accounted for in the final model, with the addition of the children's temperament in the second step explaining a significant 9% of additional variance. The addition of family characteristics

Table 5 Emotion Understanding, Temperamental Anger, and Family Relationships as Predictors of Older Siblings' Jealousy in the Triadic Sessions

	Older Sibling in Mother Session		Older Sibling in Father Session	
Predictors	Jealous Affect	Behavioral Dysregulation	Jealous Affect	Behavioral Dysregulation
Step 1				
Age space	−.25	−.11	−.05	−.11
Session order	.15	.16	.25	.35**
Facilitative parenting	−.18	−.13	−.11	−.13
Step 2				
Age space	.10	.15	−.08	.05
Session order	.14	.17	.24	.34**
Facilitative parenting	−.21	−.15	−.12	−.14
Emotion understanding	−.40**	−.20	.08	−.08
Temperamental anger	.29*	.33*	.06	.24
Step 3				
Age space	.08	.03	−.07	−.06
Session order	.20	.31*	.21	.32*
Facilitative parenting	−.24	−.24	−.15	−.21
Emotion understanding	−.38*	−.15	.12	−.06
Temperamental anger	.21	.14	−.01	.14
Marital relationship	−.05	−.29*	.09	−.10
Sibling relationship	−.17	−.21	−.24	−.11
Attachment security	−.05	−.27+	.01	−.14
Step 1: R^2	.12	.05	.08	.16*
Step 2: ΔR^2	.19**	.12*	.01	.05
Step 3: ΔR^2	.02	.14*	.04	.05
Total R^2	.33*	.32*	.13	.27+

Note: βs presented in Step 3 are from the final model in which all variables were entered.
*$p \leq .05$; **$p \leq .01$; +$p = .06$.

Table 6 Temperament and Family Relationships as Predictors of Younger Siblings' Jealousy in the Triadic Sessions

	Younger Sibling in Mother Session		Younger Sibling in Father Session	
Predictors	Jealous Affect	Behavioral Dysregulation	Jealous Affect	Behavioral Dysregulation
Step 1				
Age space	−.12	−.08	.23	.24*
Session order	.27*	.56***	.32*	.43***
Facilitative parenting	.13	.16	.10	.33**
Step 2				
Age space	−.18	−.08	.22	.23
Session order	.21	.56***	.33**	.44***
Facilitative parenting	.17	.15	.11	.34**
Temperamental anger	.31*	−.01	.05	.07
Step 3				
Age space	−.18	−.07	.24	.23
Session order	.21	.56***	.30*	.43**
Facilitative parenting	.17	.14	.10	.33**
Temperamental anger	.32*	−.01	.05	.08
Marital relationship	.05	.14	.06	−.05
Sibling relationship	−.27*	−.23*	−.22	−.11
Attachment security	.04	.05	.15	.13
Step 1: R^2	.09	.31***	.15*	.31***
Step 2: ΔR^2	.09*	.00	.00	.01
Step 3: ΔR^2	.07	.07	.06	.03
Total R^2	.25*	.37***	.22$^+$	.35**

Note: βs presented in Step 3 are from the final model in which all variables were entered.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; $^+$ $p = .06$.

did not explain a significant amount of additional variance in the younger siblings' jealous affect, but the positive quality of the sibling relationship and the children's temperamental anger were significant predictors in the final regression model. Younger siblings who were less temperamentally angry and who had more positive sibling relationships were less likely to display jealous affect in the mother sessions.

For the regression results that examined the younger siblings' behavioral dysregulation with mothers, a total of 37% of the variance was accounted for in the final model. The majority of the variance (31%) was explained in the first step. The addition of the child and family relationship variables in the last two steps did not add unique variance. In the final step of the model, only session order and the positive quality of the sibling relationship were significant predictors of the younger siblings' dysregulated behavior with mothers (see Table 6).

In the two remaining models that examined the younger siblings' jealous affect and behavioral dysregulation with fathers, only a marginal 22% of the variance in the children's jealous affect was accounted for by all the variables in the model. Session order was the only significant predictor of the younger siblings' jealous affect in the final step (see Table 6). A significant 35% of the variance in the younger siblings' behavioral dysregulation was accounted for in the final regression model, with session order and fathers' facilitative behavior during the jealousy paradigm the only significant predictors in the final model. Child characteristics and family relationship quality did not account for additional variance in these models.

DISCUSSION

The current investigation addressed the social emotion of jealousy in early childhood, with a specific emphasis on sibling jealousy. We were particularly interested in the organization of emotional expressions and coping behaviors in a jealousy-inducing paradigm consisting of parents and young siblings. We were also interested in whether there was consistency across social triangles with mothers and fathers with respect to the children's behavior and emotions, and

whether children's jealousy could be predicted from child and family characteristics.

The Jealousy Complex between Young Siblings

As expected, there were coherent patterns of intercorrelations between emotional expressions and coping behaviors within the triadic contexts for older and younger siblings and within the mother and father sessions. A general pattern suggested that those children who expressed negative affect were more likely to interfere with the interaction between parent and sibling, and less likely to focus their attention on alternative play activities. This pattern of intercorrelations between behavior and emotion was replicated for both siblings and with both parents, thus providing confirmation in four instances that jealousy can be described as a complex of emotion and behavior within a specific relationship context. If the findings pertaining to the older siblings' emotional understanding are taken into account, there is also evidence for the cognitive component of the jealousy complex, at least on the part of the older siblings. Recall that the older siblings' emotional understanding was significantly correlated with their jealous affect and behavioral dysregulation in the mother–sibling sessions, with greater emotional understanding associated with less jealous affect and less behavioral dysregulation. These relations between jealous affect, behavioral dysregulation, and emotion understanding would seem to support the notion that jealousy is an interrelated complex of behavior, affect, and cognition in a particular social situation, even among these young children.

Despite this organized coherence within the mother and father sessions, there was little consistency in the same child's behaviors and emotions across mother and father sessions. In other words, if the child was angry with the mother, this did not mean that the child was angry with the father. This was the case even though the mother and father sessions were only separated by a short period of 3 min. The jealousy complex appears to be sensitive to the dynamics inherent in a specific triad and does not necessarily generalize across social triangles, at least for this young age group. Further support for contextual specificity was found in many of the final regression models, wherein the session order continued to be a strong independent predictor of both children's jealousy in several cases, and this was particularly true for the younger toddler. That is, the contextual manipulation as to which child was challenged first or second continued to exert a significant and unique effect on the children's affect and behavior even after controlling for child and family characteristics.

The contextual manipulation, however, did not have the same effect on older and younger siblings. Younger siblings expressed more jealousy if they had been challenged first, rather than second, and this was true for both mother and father sessions. In contrast, older siblings were more jealous with their fathers if they had been challenged second. Why this was the case is not entirely clear. Obviously, the younger toddlers had a more difficult time regulating their jealousy when they were not allowed to play with their parent and the exciting new toy first. When the parents did attend to them first, they were less jealous of their older sibling in the later session, as if being first somehow left them contented and better able to regulate their jealousy when their parents attended to their older sibling. It is more difficult to understand why the older sibling would exhibit more jealousy with fathers when they were challenged second. Knowing that younger siblings were more distressed when their older brother or sister had special time with the father first reveals that this "special time" was actually taking place in the presence of a jealous younger sibling trying to intrude on the interaction between the father and the older sibling. Perhaps older siblings were more jealous with fathers when challenged second because they felt cheated out of having their time with the father, particularly when the distressed toddler took their place and was now getting all of father's attention; or perhaps there was an emotional contagion effect, wherein the distress of the younger sibling left the older sibling more aroused during the second session and hence, less able to maintain a regulated state. Whichever scenario is more accurate is hard to know without future investigations into children's jealousy, but in either case, these findings underscore how contextual challenges may not have similar effects on children of different ages and that contextual changes that elicit emotional reactions from one participant in the triad may, in turn, initiate emotional reactions in others.

When emotional expressions and behaviors were composited at a more global level, correlations across mother and father sessions indicated that the older siblings' behavioral dysregulation and jealous affect were moderately related; however, this was not the case for the younger toddler siblings. What might explain these findings? One possibility is that older preschool children are better at self-regulated coping and less dependent than their toddler siblings on external regulation from caregivers. Thus, for older siblings there may be greater consistency across contexts at the organizational level (i.e., relations between jealous emotions and behaviors) than there is when examining the cross-context relations for independent

behaviors and affects. In contrast to the older siblings, the younger toddlers were more likely to be dependent on external regulation from parents and had yet to develop an organized, coherent pattern of self-regulatory coping (Kopp, 1989; Sroufe, 1996). As expected, then, behavioral and emotional responses for these children may have been determined almost entirely by the social dynamics inherent in a specific jealousy triangle. Again, the regression results indicated that session order remained one of the strongest predictors of the toddlers' jealousy within both mother and father sessions, with those toddlers who were challenged first displaying more jealous affect and behavioral dysregulation with their mothers and fathers than if they were challenged second. In addition to session order, the fathers' facilitative behavior during the triadic paradigm was the only other significant predictor of the younger siblings' behavioral dysregulation with the father, indicating that the fathers' facilitative management of the children's behavior within the social triangle supported the toddlers' coping with jealousy.

Predicting Emotions and Behavior from Child and Family Characteristics

In most cases, there were more significant relations between the child and family indicators and the children's behavioral dysregulation than between these indicators and jealous affect. In the correlational analyses, for example, older siblings were more behaviorally dysregulated with mothers when they were less secure in their attachment to their mothers, and their parents reported more negative and less positive marital relationships. They were more behaviorally dysregulated with their fathers when fathers reported more sibling rivalry, and children had an insecure attachment to their fathers and were prone to anger. In the regression analyses, however, positive marital interaction was the only significant family predictor of the older siblings' ability to regulate behavior in the jealousy triad with mothers, and session order remained a strong predictor of the older siblings' behavioral dysregulation with both mothers and fathers. In the case of the younger siblings, the quality of the sibling relationship was the only family indicator to predict the younger children's behavioral dysregulation and jealous affect, with less jealous affect and dysregulation when mothers reported more positive involvement between siblings. Surprisingly, none of the child or family characteristics predicted either the older or the younger siblings' jealous affect and behavioral dysregulation with fathers in the final regressions, once session order, age space, and parent behavior were controlled. As noted above, however, the fathers' behavior during the jealousy paradigm was a significant predictor in the final regression analyses that examined the younger siblings' behavioral dysregulation, indicating that fathers were able to provide the assistance necessary for these young children to regulate their jealous behavior. Given the lack of studies on childhood jealousy, in general, and with fathers specifically, it is difficult to know what might account for the current findings with fathers. Perhaps aspects of family life not captured in the current investigation (e.g., co-parenting) would better predict children's jealousy in the father–sibling triads. Only continuing investigations of children's jealousy can provide some insight into why child and family characteristics did not predict the children's affect and behavior in the father sessions.

When associations were found for jealous affect, it was mainly the children's characteristics that revealed the most consistent findings. Yet, different child characteristics were predictive of the older and younger siblings' jealous affect. In the final regressions, temperamental anger was clearly significant in predicting the expression of the toddlers' jealous affect with mothers, but it was the older children's cognitive understanding of emotions, not their temperament, that was the sole predictor of the older siblings' jealous affect with mothers. As children mature, their cognitive understanding of cultural display rules and the appropriate expression of anger in social situations may eventually temper the child's biological proclivity to react angrily. Children with a more sophisticated understanding of others' emotions are better at affective perspective taking and have the capacity to empathize with others (Lennon, Eisenberg, & Carroll, 1983). Rather than simply reacting with anger, older children would not be expected to be as emotionally reactive in the jealousy paradigm because they can cognitively process the social situation in such a way that more positive, empathic feelings for the younger sibling are aroused. Older children may simply have a better understanding of why their parents may direct more attention toward a younger sibling than toward themselves (e.g., she's my baby sister and cries a lot) and this understanding helps them cope effectively with jealousy (Kowal & Kramer, 1997).

Family Processes in Two-Child Families

Children in the same family do not experience mothers, fathers, siblings, and marriages in the same manner (Hetherington, Reiss, & Plomin, 1994). Be-

cause of differences in age, gender, and timing of family transitions, family relationship functioning need not have a uniform effect on all children in the family. This may explain, in part, why attachment security and marital functioning revealed more associations with the older siblings' jealousy with mothers, whereas sibling behaviors were the primary correlates of the younger siblings' jealousy with mothers. Recall that many of the older children in these families had an exclusive relationship with their mothers 16 months earlier. This changed dramatically and swiftly once their baby siblings arrived. Little is known about changes in family life over this transition period. How parents cope with and manage stress, as well as minimize disruption and conflict in family relationships during this time, surely has an effect on the older children's emotional well-being and their ability to cope with jealousy of the younger siblings (Baydar, Greek, & Brooks-Gunn, 1997; Kendrick & Dunn, 1982; Stewart, Mobley, Van Tuyl, & Salvador, 1987; Teti, Sakin, Kucera, Corns, & Das Eiden, 1996). Changes in the mother–child relationship across this transition period (e.g., increased control, decreased positive involvement) have been found to mediate the effects of the sibling birth on the older children's socioemotional and cognitive development (Baydar et al., 1997). Thus, the quality of parent–child and marital relationships, and change in these relationships over the transition period, may be the best predictors of the older siblings' behavioral coping with sibling jealousy.

As for the younger siblings, who have only known life with an older brother and sister, the parents' attention and love must always be shared with an older sibling. How well the older siblings adapt to this transition and the quality of the developing sibling relationship may be a better predictor of the toddler siblings' coping with jealousy than the quality of other family relationships. Older preschool siblings are more mature physically, emotionally, and cognitively than the younger toddlers. They also initiate more sibling conflict (Volling, Youngblade, & Belsky, 1997) and are more likely to manage sibling interaction than are younger siblings (Stoneman, Brody, & MacKinnon, 1984). If, as Patterson (1986) ascertains, sibling relationships are a "training ground" for childhood aggression, the quality of the sibling relationship may be particularly relevant for the developing toddlers' emotion regulation. Those toddlers who interact with a behaviorally dysregulated, jealous older sibling who is physically stronger and more likely to instigate conflict may be at risk for the development of emotion regulation disorders (Cole et al., 1994), whereas those toddlers who interact with an older sibling who is emotionally regulated, cooperative, and caring toward the younger child may be less likely to experience behavioral dysregulation. In this regard, Tremblay, Nagin, Seguin, and Zoccolillo (2001) recently reported that having a sibling in the home was the largest risk factor in predicting the developmental trajectory of a highly aggressive group of toddlers starting at 17 months of age.

Positive Marriages and Family Life

With so much emphasis on the link between marital conflict and children's behavioral and emotional maladjustment (e.g., Cummings & Davies, 1994), it was striking to find that positive marital relationship functioning emerged as the most significant family predictor of the older child's behavioral dysregulation with mothers.[1] Older children were better regulated when spouses' accounts of their marriage were more positive. The positive marital relationship composite consisted of the spouses' reported feelings of love for one another, as well as their attempts to enhance their marital relationship through discussion, disclosure, and problem solving. Discussion and problem solving reflect a set of behavioral skills and communication patterns that others have found to predict satisfying, long-term marriages (Gottman, 1994; Prado & Markman, 1999). It is possible that parents involved in such marital communication model a form of problem-solving or conflict resolution for their children that allows them to cope adaptively with sibling conflict and jealousy. Another possibility for explaining the significance of positive marital relationships is that spouses who love one another and make efforts to enhance their marital relationship create a family environment that is filled with positive emotions (e.g., happiness, contentment, and pleasure). As a consequence, there is less reason to be jealous in a home in which love and happiness are shared and expressed by all family members. Thus, it is not simply the absence of anger or fear in children's lives that leads to optimal child development, but the presence of love, joy, and contentment that allows children to feel emotionally secure (Cummings & Davies,

[1] In a follow-up regression analysis, the marital relationship composite was broken down into its positive and negative dimensions and the regression analyses were rerun using both the negative and positive marital composites as separate indicators of marital relationship functioning. Spouses' reports of positive marital functioning (i.e., love and maintenance), not negative marital functioning (i.e., conflict and ambivalence), continued to predict the older siblings' behavioral dysregulation with mothers, above and beyond the Step 1 variables (i.e., age space, session order, and parent behavior) and child characteristics.

1996), to broaden their attention to environmental events (Fredrickson, 1998), and to explore and learn from these experiences (Sroufe, 1996).

The current research marks a first step in uncovering the complexity of social emotions within the family. There are a number of limitations to this work that must be noted. First, the current sample was relatively small, and consisted of young toddler and preschool siblings and families who were primarily European American, maritally intact, and low risk. It is not clear whether similar findings would emerge in different family structures (e.g., stepfamilies, families with twins), families with older children, families of color, or high-risk families. Second, given the young age of the siblings studied, assessments of children's cognitive processes were not included in delineating the jealousy complex. From a developmental perspective, cognitive appraisal processes should emerge over time and become more sophisticated as the young child relies less on others for self-regulation and more on internalized strategies of regulation. Needless to say, such possibilities should be explored further.

In closing, the present investigation attempted to expand the study of emotion regulation by including more complex social emotions and attending to the social relationships that help to define and explain such emotions. We presented a preliminary model of sibling jealousy in childhood based on prior work on romantic jealousy in adulthood. The current model presents an initial attempt to formulate the jealousy complex between young siblings and provide a framework from which future developmental research on jealousy can begin. Because there are so few developmental studies addressing jealousy, it is difficult to know how much of the proposed model will endure scientific scrutiny and how much will need to be amended. The model has been developed specifically to describe and explain sibling jealousy, but there are certainly other areas within child development in which a similar model might be applied. Jealousy is suspect in explaining the hostility exchanged between individuals involved in any close intimate relationship, whether it be between best friends, angry spouses, or dating adolescents (Bookwala, Frieze, Smith, & Ryan, 1992; Buss & Shackelford, 1997; Hansen, 1985; Paul, Foss, & Galloway, 1993). Much of what developmental researchers have coded as aggression, conflict, hostility, and anger could indeed be one piece of a more complex social and emotional dynamic. Without attention to the larger social relationship contexts in which emotions, behaviors, and cognitive appraisals occur, the meaning of emotional experiences, their explanation, and the possibilities for intervention remain limited.

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