

## Chapter 2

# Jealousy in Infants: Defended and Defined

*Jealousy was plainly exhibited when I fondled a small baby doll*  
—(Darwin 1877, p. 289).

Jealousy's defining feature is threat of losing exclusivity in a valued relationship to a rival (Daly et al. 1982; Parrot and Smith 1993; White and Mullen 1989). This operational definition was based on work with adults in romantic and sexual relationships, but has been applied to relationships involving friends and siblings (DeSteno et al. 2006; Dyck 2010; Harris 2003; Parrott 1991; Salovey and Rodin 1984). It has been argued that the basic processes that underlie jealousy's experience in adults' relationships also play a role in the valued relationships of children (Campos et al. 2010; Clanton and Kosins 1991; Harris 2003; Lavalée and Parker 2009; Parker et al. 2010; Vollmer 1998; White and Mullen 1989). This line of thought has included questioning whether these processes could also operate at some level in the valued relationships of infants (Harris and Prouvost 2014). Thus, we ask, can the term "infant jealousy" that emerged from anecdotal accounts (Gesell 1906) be justified on the basis of empirical research? If so, can this construct be further refined and defined? These are the central questions that we address in this chapter.

Research on jealousy is problematic for a number of reasons. First and foremost is the fact that there is no form of expression that is known to be uniquely tied to jealousy (Bryson 1991; Parrott 1991; Sabini and Silver 2005). Unlike the smile which is generally interpreted as a sign of joy, or the brow flash which denotes anger, studies have failed to uncover any particular form of expression that is specific to jealousy. With few clues pertaining to morphology, other than the expectation that it will be negatively valenced, research with infants and young children has proceeded by adopting methods from work with adults. These have taken advantage of the uniqueness of the context responsible for eliciting jealousy. This, of course, is the triadic context consisting of an individual, her beloved, and an interloper who represents threat to the individual's valued relationship with the beloved. Thus, studies have explored whether and how child reactions differ with changes in this type of social context. Drawing on the operational definition developed in work

with adults, i.e., threat of loss of exclusivity in a valued relationship to a rival, the majority of studies in this area have explored contexts in which the mother-child relationship represents the valued relationship, and the rival is a sibling. In this literature, eliciting contexts in which parental attention is directed preferentially toward the rival are described as entailing “differential treatment”.

## The Newborn Sibling's Arrival

The birth of a sibling has long been recognized as an occasion that opens opportunity to address child reactions to the loss of mother's exclusive attention. The intensity of child responses and the regularity with which they occur stimulated a large body of research. These works began with naturalistic approaches, but eventually they included experimental designs that used naturalistic events as a template for the design of laboratory paradigms involving differential treatment of children.

Beginning in the 1970s, naturalistic approaches were used increasingly to track signs of maladjustment in young children before and following a newborn sibling's arrival. Publications that appeared in the literatures on developmental psychology, psychiatry, and obstetrics (Baydar et al. 1997; Dunn et al. 1981; Field and Reite 1984; Gottlieb and Mendelson 1990; Gullicks and Crase 1993; Kojima et al. 2005; Legg et al. 1974; Nadelman and Begun 1982; Stewart et al. 1987; Taylor and Kogan 1973; Trause et al. 1981) reported a wide array of responses, most of which were negatively valenced in affective tone. These ranged from internalizing responses marked by decreased joy, flatness, and withdrawal, to acute responses marked by crying, tantrums, and confrontations with mother involving argumentativeness, disobedience and deliberate naughtiness. In addition, there were reports of somatic complaints and problems with sleep as well as instances of regression in self-care skills, such as toileting accidents and reverting to drinking from a bottle.

Several studies adopted quasi-experimental approaches by adding a matched group of children who had *not* experienced the arrival of a newborn sibling. Compared with this group, children who had made the transition to older sibling displayed greater crying, help-seeking behavior and inhibition (Arcus and McCartney 1989; Feiring et al. 1983). Findings on changes in the quality of attachment security (Ainsworth et al. 1978) have been less clear. Some evidence suggested that the birth of a sibling was associated with a decrease in the quality of attachment security (Teti et al. 1996). Work which included a comparison group (Touris et al. 1995) found that in comparison with children whose sibling status had gone unchanged, those who had undergone the transition to older sibling were more likely to also undergo change in attachment status. However, changes from secure-to-insecure were as frequent as changes from insecure-to-secure, suggesting that there were increases in emotional upheaval, though these changes were not necessarily negative in direction.

Overall, studies on a newborn sibling's arrival confirmed anecdotal accounts of disturbances at this juncture, and they did so with a level of agreement that is

striking for its regularity. As a consequence, the transition to older sibling continues to be regarded as the most challenging event that is endured by most children (Rutter 1981), and adjustment issues continue to be of concern. This is especially the case in instances where child responses are acute (Campbell 2002; Kramer and Ramsburg 2002). Reminiscent of early dramatic accounts (Gesell 1906; Levy 1934), some cases are exceptionally serious as illustrated by the fact the American Academy of Pediatrics' *Diagnostic and Statistical Manual for Primary Care (DSM—PC): Child and Adolescent Version* (Wolraich et al. 1996) provides a checklist of *Environmental Situations and Potentially Stressful Events* (p. 39) to help guide clinicians' psychological evaluations of children. Tellingly, the list includes "addition of a sibling" among known traumas, such as parental divorce, abuse, homelessness, and natural disasters.

Finally, the body of work on the transition to older sibling is important in light of its potential contribution to understanding the ontogenesis of sibling conflict, an issue that is of growing concern given mounting evidence of its prevalence and consequences. Sibling aggression affects 70% of American homes, making it the prevailing form of intra-familial violence (Caspi 2012; Hoffman and Edwards 2004; Krienert and Walsh 2011a, b). It has been linked with emotion dysregulation, conduct disorders, externalizing problems, sibling abuse trauma, substance abuse, and delinquency (Button and Gealt 2010; Caffaro 2014; Garcia et al. 2000; Green 1984; Kolak and Volling 2011; Natsuaki et al. 2009). In line with theory that the sibling relationship is an important influence on personality (Adler 1928; Levy 1934; Winnicott 1977), at least two recent meta-analyses point to sibling conflict as an independent potential contributor to child psychopathology (Volling 2012; Buist et al. 2013).

Sibling aggression is also being increasingly recognized as a precursor of aggression toward peers (Berndt and Bulleit 1985; Dishion and Bank 1984; Dishion and Patterson 2006; Defoe et al. 2013; Menesini et al. 2010; Patterson and Steinmetz 1977; Stormshak et al. 1996; Williams et al. 2007). Longitudinal studies have documented developmental trajectories of aggressive behaviors starting in children as young as preschoolers. Ensor and associates (Ensor et al. 2010) reported evidence of continuity between antisocial behaviors towards preschool-age siblings at home and bullying of peers at school. To the extent that sibling conflict is rooted in jealousy, and evidence suggests that jealousy's contribution is not insignificant (Brody 1998; Buist et al. 2013; Kolak and Volling 2011), attention to the onset of child disturbances upon a sibling's arrival is warranted.

## Paradigms using a Sibling as Rival

Although anecdotal accounts of child disturbances were upheld by findings of naturalistic studies, and even though these disturbances were routinely interpreted as jealousy by parents and clinicians alike (Draghi-Lorenz 2010; Griffin and De La Torre 1983; Legg et al. 1974), the extent to which they can, in fact, be attributed

to jealousy is unclear. In addition to loss of exclusivity in the child's relationship with caregivers, the arrival of a newborn sibling coincides with a number of events, including some that are known stressors. Coinciding events, such as changes in routine and mothers' hospitalization for childbirth, represent stressors that have, in themselves, been found disturbing to children (Field and Reite 1984; Trause et al. 1981). The coinciding stressor that has been taken most seriously is diminishment in the quality of mother-child interactions (Dunn 1992; Gottlieb and Mendelson 1990; Howe and Ross 1990; Sewall 1930). This was documented in several studies that addressed the manner in which mothers cope with the increased physical demands of pregnancy and, soon after that, caring for a newborn infant in addition to a young child (Baydar et al. 1997; Dunn and Kendrick 1980; Feiring et al. 1983; Stewart et al. 1987; Taylor and Kogan 1973). In light of the prevalence of postpartum depression, currently estimated at 13–19% (O'Hara and McCabe 2013), which is known for its association with problematic mother-child interactions, risk for child neglect, and deleterious child outcomes (Field 2000; Goodman and Gotlib 2002; Kotch et al. 2008), the downturn in maternal responsivity around the time of a newborn sibling's arrival is not to be taken lightly. Nevertheless, its potential to precipitate child responses that overlap with jealousy has compelled researchers to seek other avenues in order to pinpoint jealousy's independent contribution to children's disturbances upon a sibling's arrival. One such avenue is via experimental research.

The first experimental study to offer an interpretation of jealousy was one designed with the aim of determining whether young children perceive and are affected by displays of emotionality that are *not* directed toward themselves (Cummings et al. 1981). It compared the reactions of children, 10-months to two and a half years of age, while their parents expressed anger or affection toward each other. Findings revealed that when they witnessed their parents displaying angry outbursts toward each other, children reacted with anger. However, children were also affected by their parents' displays of affection, and interestingly, these too elicited anger in children. Notably, the investigators' interpretations of children's anger differed with context. Whereas children's anger in response to inter-parental anger was explained as modeling of negative affect, children's anger in response to inter-parental affection was ascribed to jealousy.

Research designed specifically with the aim of inducing jealousy began with a novel laboratory procedure using triads consisting of a parent and a pair of toddler- and preschool-aged siblings (Teti and Ablard 1989). The differential treatment paradigm was implemented by manipulating maternal attention so that only one child received mother's attention while the other child played alone. Findings revealed that when they played alone, toddlers who were insecurely attached displayed greater crying and protest. Using a similar differential treatment paradigm with a pair of siblings and mother or father, subsequent work (Miller et al. 2000) reported that during the condition in which they played alone toddlers showed increased distress as well as distracting responses, such as physically interfering between the parent and sibling.

Other research (Gewirtz and Pelaez-Nogueras 1999; Roth and Gewirtz 1998) used pairs of 11- to 14-month-old twins. Findings revealed that infants' negative

reactions were highly dependent on the direction of maternal attention. As expected, an infant's negatively-valenced behaviors were greater when maternal attention was directed toward her twin sibling.

## Paradigms using a Non-Sibling as Rival

Without a doubt, the introduction of a laboratory paradigm for investigating differential treatment (Teti and Ablard 1989) led to fruitful methodology for investigating sibling conflict. However, interpretations of jealousy were clouded by the fact that while being subjected to differential treatment children were also being subjected to parental unresponsiveness. Difficulties also arose from using siblings since parenting behavior is not easily controlled, especially when children differ in age. Miller and associates (Miller et al. 2000) found that parents differed in their handling of older *versus* younger children. It should also be recalled that contexts that entail preferential treatment among siblings differ from those marked by a newborn sibling's arrival. A key difference pertains to the fact that young siblings share history of interaction, and possibly conflict. These may or may not be experiences marked by competition, favoritism, or perceived favoritism. The siblings may or may not be friends. Overall, a parent's preferential attention toward a sibling is a complex event in which responses due to jealousy are easily obscured by emotionality stemming from a host of past and current experiences, some related to the experimental manipulation and some not.

To help control for variation in parenting behaviors due to child age and history of sibling conflict, some investigators have used a non-sibling to serve as rival. Additionally, to eliminate confounds between differential treatment and parental unresponsiveness, studies have been designed so that the target child is ignored during both the experimental and control conditions. These designs allow child responses during the experimental condition to be compared with those in a control condition in which parental attention is directed toward an adult or toward a non-social object, such as a book, puzzle or questionnaire. Admittedly, control conditions such as these may, in themselves, be viewed as stimulating jealousy (Hart 2010b; Reddy 2010). A wife, for example, can be jealous of her husband's love of golf or his business partners, and a husband can be jealous of his wife's devotion to her computer. Even so, these kinds of rivals are rarely seen as strong stimuli, and their inclusion in study paradigms engenders useful controls that help tease apart effects of differential treatment from those due to parental unresponsiveness.

Draghi-Lorenz and associates (Draghi-Lorenz et al. 2001) compared rates of crying among 5-month-olds during an experimental condition in which their mothers directed attention toward an infant *versus* a control condition in which the object of maternal attention was an adult. Findings revealed that whereas only 10% of infants cried when they watched their mother's converse with an adult, 50% cried when their mothers cuddled an infant. Research with infants and children between the ages of 4 months and 4 years (Masciuch and Kienapple 1993) placed an unfamiliar

infant or a same-aged unfamiliar peer in the role of rival. In a control condition, mothers completed a questionnaire. Using a global scale of emotionality, from positive to negative, findings revealed that regardless of age, infants and children were more disturbed when maternal attention was directed toward the infant or peer *versus* the questionnaire. Qualitative descriptions of child responses suggested that 4-month-olds showed mood deterioration. Eight-month-olds ceased play, frowned, fussed, and attempted to make visual and physical contact with mother. One-year-olds verbalized and used behavioral tactics to approach and interfere.

Studies by Bauminger and associates (Bauminger 2010; Bauminger et al. 2008; Bauminger-Zvieli and Kugelmass 2013) explored jealousy primarily with the aim of understanding its presentation among children with autism spectrum disorder (ASD). However, the inclusion of a comparison group of typically developing preschoolers afforded opportunity to examine jealousy among children of this age. These groups of children were exposed to conditions in which their mothers read a book aloud while a familiar peer was either present or absent. Findings on typically-developing 32-month-olds revealed that negativity was greater during the condition in which the peer was present. Recent work with 55-month-olds (Bauminger-Zvieli and Kugelmass 2013) included conditions in which the peer was again either present or absent, and where the adult was either mother or a stranger. Findings revealed that jealousy was greater if the peer was present and if the adult was mother.

## **Paradigms using a Lifelike Baby Doll as Rival**

Recent studies have used a baby doll to serve as the rival. My colleagues and I (Hart et al. 1998a) found its use advantageous toward reducing spontaneous variation in the behavior of rival infants. This need was especially apparent in instances where the rival infant was fussy. Prior to adopting use of a baby doll, our pilot work had shown that a rival infant's fussiness precipitated negativity in target infants that could not be teased apart from jealousy. This particular problem had been noted by others (Masciuch and Kienapple 1993, 1996) in research using infants less than 8 months of age. However, when it surfaced in our pilot studies it was evident among both younger and older target infants. Correspondingly, we found that use of a baby doll helped limit spontaneous variation in maternal behavior toward the rival infant which tended to be augmented if the rival infant started to cry or fuss. Once our research was in progress, another advantage became apparent. Using a baby doll precluded potential for harm to a live rival infant. This benefit was especially important in cases where a target infant's response was violent. Though infrequent, attacks against the baby doll could be fierce.

In most studies, the baby doll has been kept wrapped in a receiving blanket and has natural-looking hair. In some studies, it emits babyish sounds, such as "ma-ma", by having its abdomen pressed or through some external recording. In a way that is typical for handling a newborn infant, the adult holding the baby doll offers gentle affection and vocalizes toward it using a high-pitched sing-song tone of voice



known as “motherese”. In our studies, the baby doll’s use was adopted following a manipulation check on whether it serves as a realistic replica of a real infant. For the manipulation check, our research assistants pretended to trip and almost drop the baby doll while they carried it through the pediatric unit of our university hospital. Researchers observed that upon noticing the stumble, hospital staff became seriously alarmed, suggesting that the baby doll had been mistaken for a real infant. In fact, some staff members became so alarmed we had to abandon our original plan to have the researcher drop the baby doll on the floor. More recently, ecological validity has been indicated by evidence of continuity in children’s responses to differential treatment across laboratory and naturalistic settings. Such evidence was obtained in longitudinal research (Szabo et al. 2012a, b) that reported correspondences between children’s responses in the laboratory, where jealousy was induced using a baby doll, and those demonstrated at home where the object of parental attention was a newborn sibling.

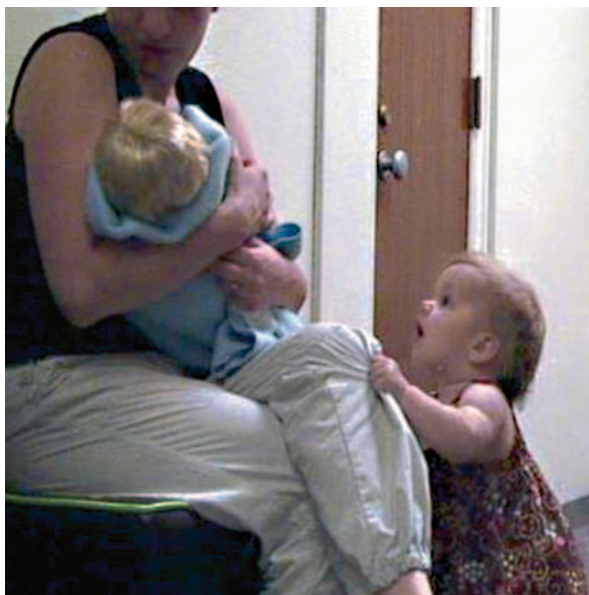
Studies that used a baby doll as rival have adopted three experimental approaches to document jealousy. These manipulated three features of the mother-child-baby doll triad: the presence of a rival, the adult’s status as attachment figure, and quality of maternal attentiveness toward the rival.

Researchers taking the first approach have manipulated the object of parental attention. In parallel with work using older children and adults, and consistent with operational definitions of jealousy in adults, these studies sought to establish whether an infant’s reaction to the loss of parental attention depends on whether parental attention has been usurped by a rival or a non-social object. Jealousy was viewed as being indexed by the child’s display of greater negativity during an experimental condition in which parental attention was directed toward the baby doll *versus* a control condition in which parental attention was directed toward a non-social object.

Work with toddlers (Szabo et al. 2013) compared 23-month-olds’ responses while mother or father directed attention preferentially toward a baby doll or a puzzle. Jealousy behavior, a global construct referring to rough play, hitting, distracting, comfort-seeking, and observing, was found greater when the object of parental attention was the baby doll. Similarly designed research using 13-month-olds (Mize and Jones 2012) explored the intensity of positive and negative affect. They found that while the control condition’s most intensely expressed affect was positively valenced, in the experimental condition it was negative. Several studies using 10- to 13-month-olds (Hart and Behrens 2013a; Hart et al. 1998a; Hart et al. 1998b; Hart et al. 2003; Mize and Jones 2012) found that when the object of maternal attention was a baby doll, infants displayed an inter-correlated set of responses marked by ceased play, resistance, and restorative bids to secure exclusive access to mother, such as clinging, whining, and pestering for attention. (See Fig. 2.1).

Disturbances were indicated further through evidence that they persist beyond the eliciting condition, sometimes leading to derailed attempts to establish interactive repair with mother (Hart and Behrens 2013b; Volling et al. 2002). Detailed attention to the manner in which 10-month-olds recover from differential treatment revealed that infants who had directed less visual attention toward mother *during*

**Fig. 2.1** A 10-month-old female infant displays distress and mother-directed approach behaviors while maternal attention is directed toward a rival



differential treatment exhibited less distress in an ensuing reunion episode where mother's exclusive attention was restored. (See Fig. 2.2). Since visual inattention to a source of stress, which in this case is the mother, serves as a regulatory strategy to help modulate distress (Buss and Goldsmith 1998; Conradt and Ablow 2010; Kopp 1982; Stifter and Braungart 1995; Stifter and Moyer 1991), emotion regulation strategies have been recognized as a constituent of the infant's repertoire of responses to differential treatment.

A few studies have observed younger, non-mobile infants, during the experimental "mother-baby doll" condition and the control "mother-book" condition. In comparison with the mother-book condition, the mother-baby doll condition was found associated with 9-month-olds demonstrating greater mother-directed visual attention and approach responses (Mize et al. 2014), and with 6-month-olds demonstrating greater negatively valenced facial affect (Hart and Carrington 2002). Since researchers (Hart and Carrington 2002) coded maternal behavior for animatedness, and cross-context comparisons did not find that maternal behavior differed across the two conditions, distinctions between infants' responses across conditions could not be attributed to variation in maternal behavior. In addition, infants' visual attention was coded for duration of mother-directed visual attention, and again, no differences were found. So it seems unlikely that greater negativity during the mother-baby doll condition could be related to differences in the salience of the object that the mother was holding. (See Figs. 2.3 and 2.4).

In a second approach toward documenting jealousy, researchers have manipulated the identity of the individual demonstrating differential treatment with the aim of determining whether infants' reactions depend on whether differential treatment



**Fig. 2.2** A 10-month-old-male demonstrates averted gaze and contact with mother while maternal attention is directed toward a rival



occurs at the hands of an individual who is an attachment figure. Following operational definitions of jealousy as an inherent feature of “valued” relationships, and in line with findings of research using preschoolers (Bauminger-Ziveli and Kugelmass 2013), jealousy was to be indexed by an infant’s display of greater negativity during the experimental condition if the baby doll was held by a parent rather than a stranger. This line of thought led to work with 12-month-olds (Hart et al. 1998a) who were exposed to eliciting conditions in which an object, again either the baby doll or story book, was held by mother or an experimenter. In line with predictions, findings revealed that negativity was greatest when the baby doll, but not the book, was held by mother.

In a third method of documenting jealousy, investigators manipulated maternal vocal-affect toward the baby doll (Hart 2010a). As in work with adults, where sense of threat posed by a rival is augmented in an individual when the rival receives increased attention from the individual’s loved one (Ben-Ze’ev 2010; Pines 1998; Tov-Ruach 1980), this study was conducted with the expectation that infants would be more upset if mothers’ vocal-affect toward the rival was positive *versus* neutral. The expectation also arose from research with infants (Hart et al. 1998a) which found an inter-correlation between maternal and infant affective tone. Interestingly, the association was negative in direction, such that the infant’s affect became more

**Fig. 2.3** A 6-month-old male infant expresses sad facial affect and forward positioning during the experimental condition. (Photo by Kenny Braun, courtesy of Sybil L. Hart, Texas Tech University)



**Fig. 2.4** A 6-month-old male infant expresses facial affect of anger and forward positioning during the control condition. (Photo by Kenny Braun, courtesy of Sybil L. Hart, Texas Tech University)



negative when maternal affect was more positive, but only when maternal attention was directed toward the baby doll. This contrasting pattern of association, which had emerged spontaneously in work with 12-month-olds, was followed-up more directly in work which exposed 3-, 6-, and 9-month old infants to two eliciting conditions, both of which entailed maternal attention toward the baby doll. However, in one condition mothers' vocal-affect toward the baby doll was neutral in emotional tone, and in the other it was positively valenced. As predicted, findings revealed that infants' displays of negatively valenced facial affect were greater when mothers displayed positive *versus* neutral affect toward the baby doll.

### ***An Operational Definition of Jealousy Protest***

Two issues were raised at the opening of this chapter: First, we considered whether infants are disturbed by parental attention to a newborn infant even if they have *not* also been subjected to stressors that typically coincide with a newborn sibling's

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Laboratory Research on Differential Treatment

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