Jealousy has been explored by social scientists primarily within the context of adult romantic relationships where its defining feature is the triangle of relations among an individual, her beloved, and an interloper who is a potential threat to the individual’s relationship with the beloved (Mathes, 1991; Parrott, 1991). In response to such threat, an individual can express jealousy via different emotions, such as anger, sadness, and fear, that can be combined in several ways (Izard, 1991; Plutchik, 1980). They can be felt in combination as a blended emotion, or separately but in succession with changes in an individual’s cognitive appraisal of the eliciting condition or deployment of different coping mechanisms (Hupka, 1984; Sharpesten, 1991). Alternatively, these emotions have been viewed as being driven by a foundational and irreducible affective experience that is unique to jealousy (Harris, 2003; Harris & Darby, 2010). Drawing on a functionalist perspective, wherein jealousy is regarded as serving to motivate behaviors that protect the individual–beloved relationship, Harris points out that in and of themselves, emotions, such as anger, sadness, and fear, are not known to be responsible for a motivational state of this nature.

Jealousy has also been addressed in the developmental literature. Interest in it as an early-emerging phenomenon arose from anecdotal accounts as well as several experimental studies in which a young child witnessed her parent directing positive attention preferentially toward a third party. Cummings and associates (Cummings, Zahn-Waxler, & Radke-Yarrow, 1981) found that when observing their parents express anger toward each other, children responded with matching displays of angry behavior. Interestingly, however, the children also demonstrated angry behavior when their parents showed each other affection. In laboratory research designed specifically to induce jealousy, Teti and Ablard (1989) found that when mothers directed attention exclusively toward one child, the child’s sibling exhibited restorative bids marked by attention-seeking behaviors, as well as protests manifested by fussing, crying, and aggression. Parallel patterns, characterized by protest and protection, as well as coping behaviors, were observed in young children in similarly designed studies where parental attention was directed preferentially toward a sibling (Miller, Volling, & McElwain, 2000; Volling, McElwain, & Miller, 2002), a peer (Bauminger, Chomsky-Smolkin, Orbach-Caspi, Zachor, & Levy-Shiff, 2008), and a lifelike baby doll (Hart & Harris, 2014; Szabo, Dubas, & van Aken, 2014).

In each of these studies, the term jealousy or rivalry was used to label children’s negative responses to differential treatment. Since several studies included infants under 18 months of age (Miller et al., 2000; Szabo et al., 2014; Volling et al., 2002), with some including infants as young as 13 (Teti & Ablard, 1989) and 10 months (Cummings et al., 1981), a number of investigators have entertained the possibility that a nascent form
of jealousy could be documented in young infants. The present article summarizes the body of research in this area. As in work on jealousy or rivalry in children, we operationally define jealousy in infants as negatively-valenced responses precipitated by differential treatment wherein a beloved individual, such as a caregiver, directs attention preferentially toward a third party. We will then address some of the contextual and intrindividual foundations of jealousy’s early emergence, and offer suggestions for future research. Through this treatment we hope to advance understanding of jealousy in its nascent form.

Evidence of Jealousy in Young Infants

In studies using infants as young as 4 and 5 months (Draghi-Lorenz, Reddy, & Costall, 2001; Masciuch & Kienappel, 1993), jealousy was explored by comparing a target infant’s responses while maternal attention was directed toward a stimulus infant versus an adult, a child, or a nonsocial object. Both studies reported greater deterioration in the target infant’s mood when the stimulus was an infant, but only one (Draghi-Lorenz et al., 2001) attributed it to jealousy. The other (Masciuch & Kienappel, 1993) mentioned that it was difficult to attribute the target infant’s deteriorated mood to the experimental manipulation due to confounds stemming from spontaneous fussiness in the stimulus infant. To help control for such limitations, several studies have used a lifelike baby doll instead of a real infant (Voorthuis et al., 2013). To induce jealousy, the baby doll has been wrapped in a receiving blanket and equipped with audio recordings of a real infant emitting utterances, such as “ma-ma.” Research that compared infants’ responses while mother’s positive vocal affect was directed toward a lifelike baby doll versus a story book reported that infants displayed greater negativity when the object of maternal attention was a baby doll (Hart & Carrington, 2002; Hart, Field, Del Valle, & Letourneau, 1998; Mize & Jones, 2012; Mize, Pineda, Blau, & Jones, 2014).

Studies that detailed infants’ responses during the mother–baby doll condition explored infants’ facial affect, behavioral, and neurological responses. Inquiry into facial affect revealed that 6- and 13-month-olds expressed sadness (Hart, Carrington, Tronick, & Carroll, 2004; Mize & Jones, 2012), which is consistent with findings on 23-month-olds whose presentations of jealousy were also characterized by this particular expression (Szabo et al., 2014). Work with 6-month-olds found that jealousy was also associated with facial affect expressions of interest (Hart et al., 2004). In studies with adults, this affect has been construed as an index of desire or love, an inherent ingredient of jealousy (Hendrick & Hendrick, 2003; Lee, 1988), and it was interpreted similarly with regard to infants (Hart, 2015).

Attention to behavioral components revealed that mother-directed approach responses were the most predictable responses to differential treatment in nonmobile 6- and 9-month-olds (Hart et al., 2004; Mize et al., 2014), and were exceptionally pronounced in mobile 10- to 13-month-olds (Hart & Behrens, 2013a; Hart, Field, Del Valle, et al., 1998; Mize & Jones, 2012). These actions were manifested through assertive restorative bids for contact, and through protests, some marked by aggressive, that expressed anger. Anger was also conveyed through findings using EEG. Inquiry into neural substrates of 9-month-olds’ responses to differential treatment found that these were characterized by relative left frontal EEG activation (Mize et al., 2014). This pattern of neural activity has been associated with approach emotions, including anger in infants (Fox, 1991; He et al., 2010), and jealousy in adults (Harmon-Jones, Peterson, & Harris, 2009).

Inquiry into behavioral components of response also yielded evidence of regulatory responses. When their mothers’ exclusive attention was restored following differential treatment, 10-month-olds were challenged by the task of establishing interactive repair. Recovery was superior among infants who had demonstrated lower durations of mother-directed gaze during the eliciting condition (Hart & Behrens, 2013b). Since averted gaze has been recognized as an emotion regulation strategy in studies on infants’ responses in stressful settings (K. A. Buss & Goldsmith, 1998; Stifter & Braungart, 1995), and since regulatory responses have been implicated in jealousy responses of both children and adults (Volling et al., 2002), visual inattention was interpreted as a regulatory strategy in the present context as well.

In addition to these findings on facial affect, behavioral, and neurological responses, inquiry into jealousy’s presentation yielded several noteworthy response patterns. First, infants’ facial affect expressions of sadness were found associated with approach behaviors indicative of anger (Hart et al., 2004). Even though these two kinds of response are known to co-occur, they usually do so in succession, in what is sometimes described as a display of ambivalence. The field of infancy research rarely reports on these two responses occurring as a simultaneous event. Instead, sad facial affect is typically seen in combination with avoidant behaviors (Cohn & Tronick, 1983; Mesman, van IJzendoorn, & Bakermans-Kranenburg, 2009), while angry facial affect tends to coincide with approach behaviors (Lewis, Alessandri, & Sullivan, 1990; Lewis & Ramsay, 2005). Thus, it appears that the infant’s affective-behavioral response to differential treatment is phenotypically unique, and tied specifically to jealousy.

By entailing components of response that are associated with both sadness and anger, jealousy’s presentation in infants suggests a mixture of emotions (Fogel, 2011; Hart, 2015). This depiction is compatible with notions of jealousy in adults as a blended emotion (Pfeiffer & Wong, 1989; Sharpsteen, 1991). Still, this does not rule out the possibility that these observable expressions of emotionality are driven by a more foundational temperamentally based sensitivity (Hart 2010a, 2010b, 2015; Hart & Carrington, 2002) or an underlying emotion that is unique to jealousy (Harris, 2003; Harris & Darby, 2010). Such an emotion is conceptualized as motivated specifically by perceived threat to a valued relationship and operates by stimulating emotions that work in conjunction toward the goal of restoring or maintaining the relationship being challenged (Harris, 2003; Harris & Darby, 2010).

Interestingly, the prominence of infants’ restorative bids supports Bowlby’s observation that, “in most young children the
mere sight of mother holding another baby in her arms is enough to elicit strong attachment behavior” (1969/1983, p. 260). Implicit in this comment is Bowlby’s understanding that as an expression of attachment behavior, jealousy is triggered by sense of threat, which coheres with understanding of jealousy in children and adults as a response to endangerment (Parrott, 1991; Teti & Ablard, 1989; Volling et al., 2002).

The combination of sadness and anger is also notable for its potential to prompt behavior in both infants and caregivers (Hart, 2015). While an infant’s expression of sadness serves as a signal that engenders caregivers’ nurturance (K. A. Buss & Kiel, 2004; Eisenberg et al., 1989; Horstmann, 2003; Shipman, Zeman, Nesin, & Fitzgerald, 2003), anger mobilizes actions that are instrumental toward achieving a goal (Frijda, 2008; Lewis et al., 1990). In the context of differential treatment, an infant’s sad facial affect may serve to reenlist caregiver attention, while anger may prompt a rival to withdraw. Indeed, some evidence suggests that jealousy acts as a signal that observers find compelling (Hart, 2010c).

A second unique pattern of linkages emerged from findings that infants’ sad facial expressions differed with the degree to which their mothers’ vocal affect toward the baby doll was positively valenced (Hart, 2010a; Hart, Field, Del Valle, et al., 1998). When mothers displayed greater positivity, their infants demonstrated greater negativity. This association is exactly opposite that which would have been expected had the mothers been smiling toward something other than an infant (Termine & Izard, 1988; Tronick, Cohn, & Shea, 1986). It is also in line with Cummings and associates’ (1981) discovery that when witnessing their parents display affect toward each other, children did not display a matching pattern of positive emotionality or affection. To the contrary, they expressed anger.

A third pattern of linkages emerged from treatments that manipulated the identity of the adult demonstrating differential treatment. When 12-month-olds were ignored while an adult’s attention was directed exclusively toward a book, their responses did not depend on whether the adult was their mother or a stranger. However, when the object of adult attention was a lifelike baby doll, infants displayed greater protest if the adult was their mother (Hart, Field, Del Valle, et al., 1998). This finding is consistent with similar research using preschoolers (Bauminger-Zvieli & Kugelmass, 2013). It is also compatible with evidence that adults who reported greater distress upon seeing their partner flirt with a third party also reported feeling more dependent (Hart, 2006; Hart, Field, Del Valle, et al., 1998; Hart & Behrens, 2013b). This is interesting for it suggests that a history of exposure to eliciting contexts, such as differential treatment and triadic conflict, which to some degree are inevitable for infants who have a sibling, is

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not a necessary precondition for the onset of jealousy. This notion is compatible with evidence that jealousy in adults does not depend on whether an individual has a sibling (Bringle & Williams, 1979; Clanton & Kosins, 1991). Given that jealousy’s onset is not dependent on history of exposure to a sibling, other kinds of influences must be considered.

A number of studies asked whether jealousy’s presentation in young infants depends on contextual events that pertain to characteristics of mothers and the mother–infant relationship (Hart, 2010a; Hart & Behrens, 2013a, 2013b; Hart, Field, Letourneau, & Del Valle, 1998; Hart et al., 2004; Hart, Jones, & Field, 2003). In line with evidence that young siblings’ presentations of jealousy were more acute among children who were insecurely attached (Teti & Ablad, 1989), jealousy in infants was found heightened among those with insecure-resistant attachment. Acute responses were also demonstrated by infants whose mothers displayed hostile or insensitive interactive behaviors. In contrast, jealousy was found blunted among infants with insecure-avoidant attachment and among infants of depressed mothers. Delerterious effects of maternal depression were compounded by parenting styles marked by disengagement. In addition to prompting presentations of jealousy that were exceptionally flat, this amalgam of risk factors was associated with infants directing restorative bids toward a stranger rather than mother, which is a well-recognized sign of emotional dysregulation in infants and young children.

These findings highlight divergent pathways of development as having roots in dyadic experiences with caregivers. They also yielded four profiles of jealousy’s development: inhibited, disinhibited, dysregulated, and organized (Hart, 2015). The latter profile, organized, is characterized by mild levels of negative emotionality, moderate durations of mother-directed restorative bids, and emotion regulation skills that enable the infant to smoothly resume contact with mother once her exclusive attention has been restored. This characterization is remarkable for offering an empirically based definition of jealousy’s normative form, not only in the statistical sense but also on the basis of associations with protective influences (Cicchetti, 2006). It is also relevant to understanding that infant jealousy’s valence, even in its typical form (as displayed by the securely attached infant of a nondepressed, sensitive mother), is negative. Unfortunately, this reality, coupled with the fact that jealousy is elicited in triadic contexts, has led to some longstanding misconceptions. The chief one is that jealousy originates due to historical events that pertain to a host of complex emotions, such as pride and guilt.
Evidence that infants are capable of responding to a relation between other individuals also emerged from work on moral cognition (Wynn & Bloom, 2014). When 6-month-olds were given a choice between two characters, they opted for the one they had seen acting in a helpful (versus unhelpful) manner toward a third party (Hamlin, Wynn, & Bloom, 2007). Similar findings were uncovered using infants as young as 3 months (Hamlin, Wynn, & Bloom, 2010). By the age of 8 months, infants demonstrated preferences for a helpful (versus unhelpful) character even if that character’s efforts to be helpful were unsuccessful, suggesting the ability to understand and even appreciate a character’s intentions (Hamlin, 2013). Cognition of this nature can drive emotionality. Cummings and associates concluded that, “by approximately 1 year of age, children are not only aware of other’s angry and affectionate interactions but are also quite likely to evidence an emotional reaction to them” (Cummings et al., 1981, p. 1280).

Taken together, these findings reflect a level of cognitive sophistication that speaks to the possibility that by the latter half of the first year an infant is able to process exchanges such as those between his mother and another infant. Moreover, it seems feasible that when observing his mother treat another child with affection, the infant is able to interpret that stimulus as posing challenge to his expectation of being the sole recipient of his mother’s affection.

Future Directions

We have argued that jealousy’s foundation rests on experiences that foster expectations of exclusivity as well as cognitive prerequisites that enable an infant to evaluate whether an exchange between his caregiver and another child represents a violation of that expectation. This calls for deeper understanding of the outgrowth of such expectations.

One avenue toward such understanding draws on theory that jealousy is necessary toward protecting access to a caregiver’s resources when these are challenged by another child (Hamilton, 1964; Trivers, 1974). This view is in line with opinion that,

when a child finds himself relatively neglected in favor of the new baby, assertion of his claims may redress the balance. Thus in the right place, at the right time, and in the right degree, anger is not only appropriate but may be indispensable. (Bowlby, 1988, pp. 79–80)

These positions are relevant to interpreting restorative bids that are an especially prominent feature of jealousy in infants. Bothersome as they may be, their intractability may be grounded in their importance toward protecting a relationship that is vital to survival (Bjorklund & Pellegrini, 2002; Dillon, 2013).

This possibility can be addressed through attention to blunted presentations of jealousy. As displayed by infants of depressed mothers and infants with insecure-avoidant attachment, inhibited presentations of jealousy seem consistent with reports of passivity and expressionlessness being exhibited by such infants in other stressful situations (Dix, Meunier, Lusk, & Perfect, 2012; Feng et al., 2008; Silk, Shaw, Skuban, Oland, & Kovacs, 2006). Attenuated emotionality has been found predictive of diminished social competence (Maughan, Cicchetti, Toth, & Rogosch, 2007), suggesting that adjustment difficulties upon a sibling’s arrival (Dunn, 1986) may be foreshadowed by jealousy’s blunted expression during infancy.

Whether and how inhibited expressions of jealousy differ from other atypical presentations is unclear. Campos and associates (2010) speculated that these may arise from protracted exposure to differential treatment. In line with observations (Bowlby, 1973) that prolonged exposure to separation from mother leads children to pass through stages of protest, despair,
and finally detachment, Campos and associates proposed a similar trajectory in which acute jealousy is an infant’s initial response to differential treatment. However, upon failing to reclaim caregiver attention, it is followed eventually by a more impaired state of resignation, marked by blunted affect. The possibility that acute jealousy is a precursor of blunted jealousy is an intriguing notion. Still, evidence that inhibited and disinhibited presentations of jealousy originate with different kinds of risk factors suggests continuity along separate trajectories. Ultimately, insight into pathways of jealousy’s development will require prospective longitudinal research on antecedents and sequelae of both organized and atypical presentations of jealousy.

Cross-sectional studies will also be informative, especially those which explore jealousy across different relationships. Evidence that differential treatment was more disturbing to infants if it had been elicited by mother rather than a stranger (Hart, Field, Letourneau, et al., 1998) coheres with understanding that in its most intense form, jealousy in adults occurs within love relationships. It is also consistent with the observation that “there is strong bias for attachment behavior to become directed mainly toward one particular person and for a child to become strongly possessive of that person” (Bowlby, 1969/1983, p. 308). Nevertheless, jealousy in adults is a feature of relationships other than those which are romantic or sexual in nature (D. M. Buss, 2000), and jealousy in children can occur among peers (Parker, Kruse, & Aikins, 2010; Parker, Low, Walker, & Gamm, 2005). In a similar vein, jealousy in infants has been noted in their relationships with caregivers other than mother, and with noncaregivers, such as peers (Bradley, 2010; Bridges, 1932; Darwin, 1877; A. Freud & Dann, 1947).

The possibility that jealousy in infants is not limited solely to protecting the relationship with the primary caregiver calls for inquiry into expectations of exclusivity as they arise across a spectrum of relationships. These relationships may provide the infant with caregiving, or hold potential to provide surrogate caregiving, or offer entirely different sorts of desirable resources. Based on numerous anecdotal accounts, comparisons of this nature are likely to reveal that the infant who expects to be the sole recipient of his mother’s resources can, at the very same time, also expect to be the sole recipient of his father’s resources and those of others as well. Consequently, it is plausible that efforts along these lines will reveal that infants’ expectations of exclusivity tend to operate in a nonreciprocal, rather than bidirectional, manner.

A relationship that may be especially informative is that which includes twins (Fearon, Bakermans-Kranenburg, & van IJzendoorn, 2010). A study that used pairs of 11- to 14-month-old twins found that differential treatment prompted responses much like those which had been reported in research where the rival was not a twin (Gewirtz & Pelaez-Nogueras, 1999). The fact that differential treatment appears to elicit jealousy in twins, who most likely have lesser history of exclusive contact with a caregiver, raises questions about the nature of dyadic interaction that is sufficient for engendering expectations of exclusivity. One possibility rests on observations that triadic social contexts do not preclude opportunities for an infant to receive preferential treatment. This was illustrated in a qualitative study that described how a caregiver of twins alternated the direction of her attention between each infant individually (Draghi-Lorenz, 2010). Perhaps the degree of exclusivity that is inherent in preferential treatment is sufficient for precipitating expectations that can give rise to jealousy. This would help explain why jealousy’s emergence does not depend on birth order (Hart, Field, Del Valle, et al., 1998). Such speculation leads to suggesting that expectations of exclusivity emerge through dyadic exchanges, including those which take place within nonexclusive settings in the sense that they are embedded within higher order relationships. This calls for investigative attention to jealousy’s emergence in light of dyadic experiences and as a function of the social contexts in which these are embraced (Fearon et al., 2010; Hart, 2012).

Taken together, inquiry into expectations of exclusivity as they arise across multiple early relationships, even in the absence of exclusive contact, stands to bolster argument that jealousy emerges within the first year of life. Moreover, such efforts should reveal that, even in its normative form, nascent jealousy is a robust phenomenon. Evidence of its robustness clearly points to the evolution of functionality that is of profound importance, and so it is most worthy of investigative attention.

Declaration of Conflicting Interests
None declared.

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