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Jealousy in Adulthood

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> *If you have not experienced jealousy, you have not loved. (Saint Augustine)*
> *Jealousy, that dragon which slays love under the pretence of keeping it alive. (Havelock Ellis)*

There is no doubt that jealousy is a source of great personal misery and an emotion with far-reaching social consequences. For example, jealousy is frequently implicated as a factor in relationship dissolution, spousal abuse and even murder (Daly & Wilson, 1988; Harris, 2003a). Despite its destructive side, jealousy also may have some positive effects for individuals and relationships. For example, it alerts one to relationship threats and can motivate behaviors that protect the relationship.

This chapter will focus on jealousy in adulthood, particularly as it occurs in romantic relationships, given that this is the area that has received the most empirical attention. We begin with a discussion of theoretical approaches and conceptual debates on the nature and function of jealousy. The next sections cover factors that impact the elicitation, experience, and expression of jealousy including adult attachment styles, relationship variables, attributional processes, rival characteristics, and gender. We also examine jealousy at its most dire, including jealousy-inspired homicide and pathological jealousy. We then discuss empirical challenges faced by the field and present some new studies that actively elicit jealousy in the laboratory.

Theoretical Approaches to Jealousy

Theories of jealousy are quite varied, with researchers focusing on different levels of analyses ranging from ultimate (Darwinian) function to psychological mechanisms and situational variables. These diverse approaches have resulted in many intriguing findings. However, such variation also makes it difficult to summarize

Handbook of Jealousy: Theory, Research, and Multidisciplinary Approaches Edited by Sybil L. Har t and Maria Legerstee
© 2010 Blackwell Publishing Ltd. ISBN: 978-1-405-18579-0

major theoretical ideas in the field since researchers use a number of different terminologies and often do not place their findings in any larger theoretical framework. In this chapter, we will describe some of the more prominent ideas and try to draw connections across different approaches where possible. The first few theoretical issues we will discuss are conceptual or definitional in nature.

Defining features

For most theorists, the most defining features of jealousy are that it requires a social triangle and occurs when someone perceives that another person (who may be real or imaginary) poses a potential threat to an important interpersonal relationship (e.g., Parrott & Smith, 1993; Mathes, 1991; Salovey & Rothman, 1991; White & Mullen, 1989). Rejection, or fear thereof, can also be integral in jealousy. The rejection that induces jealousy is proposed to be different from some other types of rejection in that one's interpersonal loss involves another's interpersonal gain (Parrott, 1991; Mathes, Adams, & Davies, 1985).

Jealousy is generally agreed to be an emotion that serves to motivate behaviors that protect one's relationship from potential usurpers. As we will see, some theorists have focused on immediate consequences of jealousy-induced behaviors for individuals and relationships, whereas others have theorized about possible (Darwinian) functions in remote human ancestral past.

Most of the work on jealousy in adults has focused on jealousy in romantic relationships. However, several theorists have argued that the same basic process that produces jealous feelings in sexual relationships also leads to jealousy that arises in other kinds of relationships such as friendships or between siblings for a parent's favor (DeSteno, Valdesolo, & Bartlett, 2006; Harris, 2003a; Parrott, 1991; Salovey & Rodin, 1984). For many, the first pangs of jealousy may arise during competition with siblings for parental attention (Trivers, 1972; Volling, McElwain, & Miller, 2002).

Jealousy: A blended or specific emotion?

The exact nature of the emotional underpinnings of jealousy and the processes that give rise to it are debated. Some have suggested that jealousy involves different component emotions such as anger, fear, and sadness. One possibility is that all of these emotions are experienced simultaneously (Sharpsteen, 1991). Another hypothesis is that the specific emotion one feels changes over the course of a single jealous episode as appraisals of the situation change (Hupka, 1984). A third possibility is that jealousy is a term that encompasses any of a variety of thoughts and feelings that arise within a specific type of social situation, namely, a love triangle (White & Mullen, 1989). There seems little doubt that various emotions can occur in situations that invoke jealousy or as a result of attempting to cope with jealousy. However, others see jealousy as a distinct affective state with its own unique motivations, separate from other emotions.

One way researchers have tried to understand distinct emotions is by focusing on their ultimate functions (Frijda, 1986). From this perspective, emotions are motivational states that have been shaped by natural selection. Each emotion functions to motivate one to engage in certain behaviors that one might otherwise not engage in—behaviors that have, over phylogenetic history, tended to confer some adaptive advantage in some set of situations (Ekman, 1992; Frijda, 1986; Keltner & Haidt, 1999). Each emotional state is proposed to have its own distinct motivational tendencies or "urges" (Frijda, 1986) that are activated by particular appraisals. For example, fear is induced by the appraisal of threat, even if not conscious, and motivates escape from or avoidance of the dangerous stimuli.

One functional view proposes that jealousy evolved as a specific emotion to motivate behaviors that break up or prevent, either psychologically or physically, the threatening liaison that is perceived to exist between an important other and a rival, and thereby, protect the primary relationship (Harris, 2003a). Importantly, this motivational state would not be created automatically by other emotions that are frequently offered as the more essential emotional components of jealousy (namely, anger, fear, and sadness). Threats to usurp relationships likely had important consequences for one's Darwinian fitness given that relationships, whether romantic/sexual or not, provide a variety of important benefits to an individual (Baumeister & Leary, 1995; House, Landis, & Umberson, 1988). For example, jealousy over siblings may have ensured that one received one's necessary share of a parent's limited time, affection, food, etc. (Trivers, 1972).

As noted above, most researchers who take a specific emotions view of jealousy assume that it was selected for by natural selection. However, theories of jealousy as a blended emotion are also potentially compatible with the idea that jealousy is an evolved adaptation.

Appraisals in Jealousy

Some researchers who employ a specific emotions perspective focus on the appraisals that give rise to jealousy (Lazarus, 1991; Harris, 2003a). Although the appraisal and motivational approaches can be viewed as distinct, they are generally complementary and in practice often tend to differ only in a matter of which aspect of an emotional episode is emphasized (Lerner & Tiedens, 2006).

Primitive and elaborated jealousy

One possible model of jealousy is that it has a primitive or "core" form that can be elicited by a primary appraisal of threat that arises from input as simple as the perception that a loved one has turned their attention to a potential rival and away from the self (Harris, 2003a). The jealous state would then motivate

behaviors designed to restore the loved one's attention to the self. Ontogenetic studies that find jealousy in infants as young as 6 months and cross-species work that documents behaviors resembling jealousy in nonhuman animals would be consistent with the view that minimal cognition, which need not be conscious, is necessary for the elicitation of jealousy (Cubiciotti & Mason, 1978; Hart & Carrington 2002; see also other chapters in this volume).

However, at least in humans, jealousy can also take on a more elaborate form. With cognitive development, triggers for jealousy become more sophisticated. For example, work by Masciuch and Kienapple (1993) finds that even by 4 years of age, the specifics of a social triangle influence whether jealousy arises. Children who were 4 or older expressed more jealousy over their mothers interacting with a similar-aged peer than with an infant. Jealousy in younger children was not affected by the age of the rival. One possibility is that in this situation, older children have learned that babies require special attention. Therefore, one's mother paying attention to an infant is perceived as less threatening relative to her appearing to favor a peer who is more similar to oneself. Thus, it seems that over the course of development, an individual's social and cognitive appraisals of the meaning of the interactions between the rival and the loved one become increasingly important in the evocation of jealousy.

Appraisals also play an important role in the progression of jealous affect. Extension of Richard Lazarus's (1991) theory of emotions may illuminate this progression. After the initial appraisal of threat to the relationship, one immediately engages in further cognitive assessments. These secondary appraisals include trying to determine the scope of the threat as well as attempts to cope with it (e.g., *I'll put a stop to this; Is my partner going to leave me?; It is my own fault that this happened?*). As one attempts to further assess and to deal with the jealous situation, other secondary emotions such as anger, fear, and sadness are likely to be elicited.

Social cognitive perspective

Given that many theorists have emphasized the importance of cognitive appraisals in the elicitation of emotion, it is not surprising that much of the work on jealousy in adults has employed a social cognitive framework. Research in this tradition has focused on two general features that make a partner's involvement with another particularly threatening. The first is the potential loss of relationship rewards. Many of the benefits that are obtained from interpersonal relationships are finite, such as money or resources. Even intangible rewards like affection and attention that may seem infinite are limited by time. Therefore, if a relationship partner is providing these benefits to someone else, it can be at a cost to oneself. This is likely one of the reasons why the arrival of a new sibling can be particularly difficult for a child—the exclusive attention and affection that were theirs are now shared. Interestingly, the same underlying process may also be

responsible for the feelings that new fathers sometimes express when their wives' attention is consumed by a newborn.

A second factor that plays an important role in jealousy is threat to representations of the self. The existence of a rival can be particularly threatening because it challenges some aspect of a person's self-definition (Parrott, 1991), self-identity (Salovey & Rothman, 1991), or self-esteem (Mathes, 1991). Several theorists have noted the importance that relationships play in defining the self and self-worth. Therefore, rivals to relationships not only threaten relationship rewards, but also the very value of the self. For example, when faced with a partner's infidelity, people appraise the meaning of the betrayal in terms of the implications about the self (*Did she have sex with him because I'm a bad lover? Or because I am unattractive?*). The answers to such questions will impact the intensity of the distress. According to Salovey and colleagues' "domain relevance hypothesis," rivals who surpass an individual in domains that he or she finds important and relevant to his or her self-definition are most likely to evoke jealousy (Salovey & Rothman, 1991; Salovey & Rodin, 1984; Tesser, 1988). Research on this topic will be discussed in a later section. Jealousy may be particularly likely to occur when the threatened relationship involves a person to whom one is sexually attracted or involved with because of the special importance of romantic relationships in self-esteem and in providing relationship rewards (White & Mullen, 1989).

Attachment Style and Jealousy

Romantic relationships seem to be formed, at least partially, through attachment processes that are similar to those which occur between infants and their caregivers (Hazan & Shaver, 1987). Roughly defined, an attachment relationship is an emotional or affectionate bond with another individual. As discussed in John Bowlby's (1969) seminal work, infants are predisposed to form emotional connections with their caregivers. This encourages caregivers to remain close to infants in order to provide security and care. Work by Bowlby and others, however, has shown that attachment relationships differ qualitatively.

The primary caregiver is hypothesized to play an important role in creating attachment style differences. Although some caregivers will respond immediately to an infant's distress by holding and comforting the baby, other caregivers may be more distant or inconsistent in their responses. Over time, based on these experiences, an infant develops expectations of what to expect from others and therefore what to expect from the self (Bowlby, 1969). For example, if the primary caregiver is non-responsive to the needs of the child, the child learns that others are not to be depended upon and that he or she must depend upon the self, which is characteristic of some forms of the insecure-avoidant attachment style. If the mother is responsive to the child and fills the child's needs, the child adopts a positive view of others and self, which is characteristic of the secure attachment

style (Bartholomew, 1990). Development of attachment style is also likely to be influenced by the infant's temperament as well as the interaction between temperament and the caregiver's ability or desire to respond appropriately to the particular physical and emotional needs of the infant. In childhood, the three most common attachment styles are secure, insecure-avoidant, and anxious (also commonly referred to as the ambivalent attachment style because of a tendency to draw caretakers in and then push them away). This early attachment process between the primary caregiver and the child acts as an archetype for future attachment relationships, such as romantic relationships (Hazan & Shaver, 1987).

In work with adults, Hazan and Shaver (1987) have found analogous attachment styles between adult romantic attachments and infant caregiver attachments. In adulthood, individuals with a secure attachment style tend to be more confident in themselves and in their partners. They also tend to view the attachment relationship as a positive source in their lives and find it easy to establish romantic relationships with little anxiety over possible abandonment. These appraisals and behaviors are markedly different than the anxious/ambivalent attachment style. Anxious individuals also view attachment relationships positively, yet they are anxious in the attachment relationship. They have a pervasive worry of abandonment because they fear they may not be deserving of love (Hazan & Shaver, 1987). The prototypical insecure-avoidant attachment style has a negative internal working model of others (Bartholomew, 1990). Individuals with this attachment style have little confidence in other people and as a result rarely find security in attachment relationships. Some modern theorists, such as Bartholomew (1990), separate the negative internal working model of others into two different attachment styles, fearful and dismissing. The former is characterized by a fear of attachment relationships, while the latter is characterized by a lack of need for attachment relationships. In this chapter, we will focus on the original Hazan and Shaver definition and include individuals with a negative others model under the umbrella of the insecure-avoidant attachment style.

Returning to the topic of jealousy, it is easy to imagine how attachment style and jealousy may be interrelated. At its simplest, jealousy is the feeling that arises when an attachment relationship is threatened by a third party. Given that attachment styles are associated with different expectations of relationships, it has been proposed that each style has a somewhat different reaction to possible relationship threats. As Sharpsteen and Kirkpatrick (1997) aptly point out, "because romantic relationships are likely to be attachment relationships, individual differences in jealousy are likely to parallel individual differences in attachment behavior" (p. 628). Although several studies have examined the relationship between adult attachment styles and jealousy, their findings, at least at first blush, appear inconsistent. For example, some studies suggest that jealousy is more common in insecurely attached individuals, and yet other studies suggest that securely attached individuals are more likely to show jealous anger

(Buunk, 1997; Sharpsteen & Kirkpatrick, 1997). In the next section, we will discuss such research and will present a model that may help shed light on these apparently discrepant findings.

Attachment and threat—a two-stage model

We propose that one important variable that is likely to moderate an attachment style's impact on jealous reactions is stage of threat. For example, is the threat merely a vague possibility or is it a definite reality? The first stage of this model, appraisal of a threat, occurs when an individual is just becoming cognizant of a possible rival. Not all social relationships between the partner and others will actually interfere with one's romantic relationship. In order for jealousy to be elicited, the individual must appraise that on some level the new presence is in fact vying for the attention of the partner or is a potential threat to the relationship. Individuals differ in their propensity toward appraising possible rival threat. Some have low thresholds resulting in almost any new presence being interpreted as a rival. Others have high thresholds and rarely appraise another as an interloper. Thus, the initial stage in the jealousy experience focuses on whether or not a threat from a rival subjectively exists.

The second stage of the jealousy experience is the reaction to the threat. Once a potential rival passes the threat threshold, he or she is determined to be a real rival. At this point, individuals engage in additional coping mechanisms, which include reacting to the threat. Determining how to respond to feelings of jealousy is an integral part of the jealousy experience. We now turn to discussing differences in attachment styles in these two stages of the jealousy experience.

Secure attachment style

People with a secure attachment style have positive mental models of themselves and others. They put value in relationships and tend to have longer-lasting and more successful relationships (Kirkpatrick & Hazan, 1994). The success of their relationships has led researchers to two seemingly contradictory hypotheses regarding their jealousy experiences. The secure/low reactive hypothesis proposes that secure individuals feel less jealousy. The thought is that since these people tend to have successful relationships in which both they and their partners are happy, there is probably little reason for them to fear threat from possible rivals. Thus, they should feel less jealousy. In contrast, the secure/high reactive hypothesis predicts that secure individuals should show at least similar levels or perhaps even greater jealousy compared to people with other attachment styles. In particular, they may be more prone to jealous anger or may engage in more overt actions in response to their jealousy (Sharpsteen & Kirkpatrick, 1997). As secure individuals especially value attachment relationships, they may be more prone to employ jealousy to protect their important relationships. On this view,

jealousy may help maintain the relationship by motivating the individual to eliminate possible threats to the relationship. The secure/high reactive hypothesis is consistent with a functional approach that jealousy evolved to preserve attachment relationships.

Empirical work on secure attachment style and jealousy finds supportive evidence for both hypotheses. Studies that ask participants to anticipate their levels of jealousy tend to find that secure individuals anticipate feeling less jealous than insecurely attached individuals (Buunk, 1997). However, studies that ask participants to recall instances that made them jealous tend to find little difference in jealousy levels between securely attached individuals and insecurely attached individuals (Sharpsteen & Kirkpatrick, 1997).

We suggest a way to reconcile these apparently contradictory findings. Attachment style may differentially impact jealousy depending on the temporal aspect of jealousy, namely, whether the threat is in the process of being appraised or is already certain. We propose that in the first stage, the appraisal stage, securely attached individuals are likely to have a higher threshold for appraising potential threat and are therefore likely to have less frequent bouts of jealousy. In the second stage, after the threat is certain, secure individuals are more likely to react with jealous anger.

During the first stage of jealousy, secure individuals are probably less likely to appraise others as possible threats because secure individuals have a positive mental model of their partners and therefore do not expect betrayal. Across numerous dimensions of trust, including predictability, dependability, faith, and security, secure individuals rate their partners higher than insecurely attached individuals (Simpson, 1990), which most likely translates into trusting their partners to not betray them with potential rivals. Experimental studies examining threat perception seem to confirm this hypothesis. Radecki-Bush, Bush, and Jennings (1988) asked individuals to picture their partner in situations that had been rated as high threat (their partner growing close to an old girl/boyfriend), low threat (their partner commenting on the attractiveness of another person), or non-threat (their partner's phone line being busy for a half hour). Radicki-Bush and colleagues found, that regardless of scenario type, securely attached individuals viewed the scenarios as less threatening than insecurely attached individuals. Furthermore, appraisals of threat significantly predicted the intensity of jealousy. Thus, secure individuals reported feeling less jealousy overall, which supports the secure/low reactive hypothesis and the finding by Buunk (1997) that securely attached individuals anticipate feeling less jealousy.

Turning to the second stage of jealousy, reaction to the threat, securely attached individuals seem to behave quite differently under circumstances in which a threat is more certain. When their high threshold for threat is exceeded, secure individuals appear to have strong jealous reactions. Sharpsteen and Kirkpatrick (1997) asked participants to remember times when they had actually experienced jealousy and to report on their feelings and behaviors

during these experiences. In terms of the severity of their actual jealousy experiences, secure individuals were not less jealous than insecure individuals. In fact, they reported feeling more intense anger than insecure-avoidant individuals and were more likely to direct that anger at their partner than either of the insecure attachment styles. These results lend support to the secure/high reactive hypothesis.

Directing anger at the partner is also consistent with the thought that for securely attached individuals, jealousy may have some beneficial effects. Anger that is directed at the partner may discourage the partner from encouraging interloper interest. Anger that is directed at the rival only discourages that specific rival from showing interest in the partner. Rivals generally come and go but partnerships tend to be more stable. Thus, discouraging the partner may have a longer-lasting impact on relationship maintenance than discouraging the rival. It may, therefore, be in the best interest of preserving the attachment relationship that one directs jealous anger toward the partner rather than the rival. Indeed, Sharpsteen and Kirkpatrick (1997) found that individuals with a secure attachment style were the only attachment style group to report that the jealousy experience brought the couple closer together. Thus, it appears that jealousy can, in some respects, preserve and protect the romantic relationship of secure individuals.

Insecure attachment styles

A strikingly different picture emerges for the insecure attachment styles. Anxiously attached individuals, unlike their securely attached counterparts, have little trust in their partners. They view themselves as unworthy of their partners' love or affection, and so expect their partners to abandon them at some point in their relationship. Simpson (1990) examined anxious attachment as a personality dimension and found that degree of anxious attachment is negatively correlated with the trust individuals have in their partner. Guerrero (1998) found further evidence for this negative correlation in her study in which participants endorsed the frequency of different types of jealous behaviors. Anxiously attached individuals reported that they often engaged in surveillance behavior like spying on their partner, keeping closer "tabs" on their partner, and searching for evidence of suspected infidelity in their partners' belongings.

The lack of trust that anxious individuals have in their partners may lead to a lower threshold for threat appraisal. When given potentially threatening scenarios, such as their partner dancing intimately with someone else, anxious individuals foresee themselves as being more jealous than more secure individuals. They are also more concerned over the possibility of their partner finding someone else (Buunk, 1997). In one experimental study (Powers, 2000), participants were assigned a partner and then shown video footage of their partner flirting with another person. Anxious individuals reported higher levels of

jealousy than either secure or insecure-avoidant individuals. Across multiple studies, such as these, anxiously attached individuals appear to be more sensitive to possible threats from a rival. It appears that anxiously attached individuals have lower thresholds for threat, which make them prone to more frequent bouts of jealousy.

Reactions of anxious individuals when the threat is subjectively certain are slightly more complex. Anxious individuals tend to be low in self-regard and sometimes almost seem to expect betrayal from their partners. When betrayal does come, they often suppress overt anger toward their partner and rival (Sharpsteen & Kirkpatrick, 1997), possibly to avoid further rejection. Guerrero's (1998) examination of anxiously attached individuals' reactions to jealousy-provoking events found that they feel envy of their rivals and hurt at the possibility of separation from their partner. However, instead of attempting to heal the damage done by the interloper, they engage in behaviors like distancing themselves from their partner. Thus, their distancing reactions to threat appear to be more counterproductive than the jealousy expressions of the securely attached individuals.

Insecure-avoidant individuals, who put little stock in the relationship in the first place, appear to be the least threatened by a possible rival. Guerrero (1998) reported that individuals with negative other models (a key component of the insecure-avoidant attachment style) are the least fearful of possible rivals to their relationships. As they value attachment relationships less in general, it appears as if they are the least threatened by the possibility of the relationship ending. Simpson (1990) found that of the attachment styles, insecure-avoidant individuals showed the least remorse when the relationship ended, which is consistent with placing lower value on relationships.

When insecure-avoidant individuals do feel jealousy, they tend to direct their anger and blame at the rival rather than at their partner (Sharpsteen & Kirkpatrick, 1997). When given the opportunity to aggress against their rivals, they are amongst the most aggressive (Powers, 2000). However, even though they were aggressive to the rival, the aggression appeared to lack a strong subjective component, as these individuals reported feeling the least amount of anger and jealousy of all the attachment styles during the jealousy experience (Powers, 2000).

Jealousy and Relationship Factors

The jealousy experience likely influences aspects of the relationship such as satisfaction, quality, and security. Likewise, this influence is probably reciprocal with relationship factors contributing to jealousy. What follows is a brief review of the research that examines how jealousy influences and is influenced by relationship factors.

Satisfaction and relationship quality

One recent study on jealousy has taken the unique approach of studying jealousy from both sides of the dyad—the participant and the partner (Barelds & Barelds-Dijkstra, 2007). Of primary interest was the effect of relationship satisfaction and quality on jealousy. Using a mailed survey, the researchers were able to assess how the degree of satisfaction in a relationship relates to jealousy. They found that the higher the degree of suspicion and jealous perseveration over possible betrayal in either the participant or the partner, the less satisfied either partner was in the relationship and the lower the overall quality of the relationship. Given the relationship between insecurity and jealousy, the idea that rumination over the possibility of betrayal is harmful to a relationship is hardly a surprise. But interestingly, the degree of negative affect one felt in response to actual liaisons between a partner and a rival was positively correlated with both relationship satisfaction and quality. In other words, the better the quality of the relationship, the more jealousy one felt in response to actual betrayal. As this is a correlational study, it cannot be determined in which direction the causal arrow points. However, this finding is at least consistent with the idea that jealousy can have protecting and preserving effects on relationships.

One of the few longitudinal studies of jealousy adds more support to the view that jealousy may have some positive effects on relationship maintenance. Mathes (1986) published a 7-year longitudinal study of the long-term effects of jealousy on romantic relationships. In 1978, undergraduates in dating relationships completed jealousy measures pertaining to their current relationships. Seven years later those same participants were surveyed about the nature of their relationship with that 1978 partner, including the degree of love they currently felt toward that partner. Individuals who were high in jealousy in 1978 were more likely to be married, engaged, or living with that same partner in 1985. Participants who were lower on jealousy were less likely to be still involved with that person. Mathes postulated that jealousy may safeguard the relationship from potential relationship threats. This work suggests that jealousy may have positive effects on relationship duration. However, given that relationship satisfaction was not assessed, it remains an open question whether jealousy actually also increased positive emotional experiences.

Relationship uncertainty

Knobloch, Solomon, and Cruz (2001) examined different types of uncertainty in relation to jealousy. Participants were asked to rate their self-uncertainty, "How certain are you about your feelings for your partner?", their perceptions of their partner's uncertainty, "How certain are you about your partner's feelings for you?", and uncertainty of the relationship, "How certain are you about the future of this relationship?", and the degree to which they felt different aspects of

jealousy (such as suspicion or anxiety regarding possible infidelity). Self, partner, and relationship uncertainty were all significantly correlated with suspicion and anxiety over possible threat. It appears that the more uncertain someone is about their feelings toward their partner, their partner's feelings toward them, or the future of their relationship, the more likely they are to be suspicious of possible threats.

The most likely explanation is that uncertainty may lower the threshold of subjective threat. This explanation seems consistent with what is seen in anxiously attached individuals. Indeed, Knobloch and colleagues also gave participants an attachment measure and found that anxious attachment was significantly correlated with anxiety and suspicion of betrayal. Thus, feelings of uncertainty, whether they arise from the relationship itself or from an individual's disposition, appear intricately tied with a lower threshold for appraising threat.

One factor that may influence relationship uncertainty is the existence of actual rivals. Support for rival threats affecting relationship uncertainty comes from work discussed earlier (Radecki-Bush, Bush, & Jennings, 1988) that used a jealousy-evoking imagery task to examine perception of threat. This study also asked participants in romantic relationships to rate the stability and security of their relationships while they imagined their partners in situations that were independently rated as threatening or non-threatening. Participants in the threat conditions reported more jealousy than the participants in the no threat condition. Further, the more intense the jealousy threats, the less secure the relationship felt to the participants. This finding seems consistent with the idea that feelings of jealousy are closely tied with feelings of uncertainty.

The combined results of these two studies offer us a glimpse of what may be the relationship between jealousy and relational uncertainty. It appears that the less one feels sure in a relationship, the more one appraises relationship threats in the world, which leads to more jealousy. The more jealous one feels, the more uncertain one becomes in the relationship, which in turn may feed the cycle of jealousy.

Jealousy and Attributions

Possibly the largest influence on the jealousy experience is the attributions drawn about a partner's actions. According to attribution theory (Weiner, 1985, 1995), people are constantly making appraisals about the actions of others. It is from these attributions that conclusions about others are drawn. When the outcome of an action is negative, these attributions also designate the proportion of blame the individual should receive. Recent revisions to this theory focus on three types of attributions: causality, controllability, and intent (Weiner, 1995). Causality refers to whether the action was personally caused or caused by some other force, such as fate. Controllability refers to the degree of control an actor has over

the situation. An added element of control is responsibility. Take the example of John holding Martha's arm as they walk to class. If John's partner, Jane, saw this picture she would likely be jealous and blame John for his actions, as John is personally responsible for his actions and he has a high degree of control over this action. However, if Martha was having a hard time walking because of an injury, John's responsibility is much lower than previously assumed. This detail is a mitigating circumstance that allows Jane to attribute blame elsewhere, such as the lack of handicap-accessible classrooms on campus. Finally, intention of the actor plays a large role in the attributions one makes about the actor and the situation. In the example of John holding Martha's arm, one would draw different conclusions if John were holding Martha's arm to purposely make Jane jealous than if he did not realize helping her to class would make Jane upset.

The different attributions one makes about the actions of a partner play a large role in whether of not one feels jealousy. When participants were asked to rate scenarios that manipulate causality, controllability, responsibility, and intention, the results were clear and consistent. If the partner personally caused the action, has control over the action, is responsible for the action, and intentionally committed the action, the participant felt more jealousy. The opposite was also found. Actions that someone or something else causes, that the partner has no control over, was not responsible for, and does not intend to do elicited very little jealousy (Bauerle, Amirkhan, & Hupka, 2002). Thus, in a large part, it is the appraisals and attributions one makes about a partner's actions that produce jealousy, not necessarily the actions themselves.

The Rival and Jealousy

For most of this chapter, we have examined the jealousy experience as it relates to the dyad, the relationship between the individual and his or her partner. Jealousy, however, is a triadic relationship and cannot exist without the third person—the interloper. In this section we will examine this cloaked figure and what it is about him or her that can induce jealousy.

As reviewed earlier, the domain relevance hypothesis posits that one mechanism in jealousy is threat to the self-concept. When a threat to self appears, jealousy motivates one to end that threat, and thus helps to maintain the self-concept. Threats to the self are thought to be greatest in the areas that are critical to one's self-concept, i.e., the things about oneself that are valued and boost self-esteem.

Several studies have found support for this hypothesis. Early work examined individual differences in jealousy and envy over wealth, fame, popularity, and physical attractiveness (Salovey & Rodin, 1984). People reported the greatest jealousy in those domains that were most self-relevant. DeSteno and Salovey (1996a) further tested this theory by having participants read scenarios in which

their partners conversed with a potential rival at a party. The scenarios depicted their partners as appearing attentive and interested in the rival. The rival was described as high in intelligence, popularity, or athleticism. Participants then rated their degree of jealousy. Later, participants were asked to rate themselves in each of these three domains. In support of the domain relevance hypothesis, participants felt the most relationship threat in reaction to rivals who had qualities that they valued most in themselves.

This effect may be due to the value placed on uniqueness. In forming one's self-concept, it often behooves one to draw distinctions between the self and others, thereby making oneself unique and special. Similar others may threaten that uniqueness, which may be especially threatening when that similar other is vying for the attention and interest of a beloved—the beloved that presumably fell for those unique, special qualities that are so valued by oneself in the first place (Broemer & Diehl, 2004). Thus, to know which rivals are going to inspire jealousy is sometimes as simple as looking in the mirror—they are a reflection of oneself.

Gender Differences in Jealousy

Is one gender more jealous than the other? Some studies find men to be more jealous than women, whereas other studies find the reverse. Thus, there seem to be no overall consistent differences in the intensity of jealousy in the two genders.

A controversial topic that has drawn a great deal of attention centers on whether men and women are jealous over different forms of infidelity. One theory hypothesizes that men should be particularly upset over a partner's sexual betrayal whereas women should be particularly upset over a partner's emotional betrayal (Buss, Larsen, Westen, & Semmelroth, 1992; Daly, Wilson, & Weghorst, 1982; Symons, 1979). This view (sometimes referred to as jealousy as a specific innate module or the JSIM hypothesis—see Harris, 2000) claims that such differences exist as a result of ancestral men and women having faced different threats to their rates of producing viable offspring (inclusive fitness). The problem that a man faced was that he could never know with 100% certainty that an offspring is genetically his own since fertilization occurs internally within women. Therefore, ancestral man needed a way to reduce this inclusive fitness threat by insuring that he spent his resources (food, time) only on children that were biologically his own. Supporting unrelated children supposedly would be quite costly to a man's inclusive fitness because it helped pass on another man's genes rather than his own. According to the JSIM hypothesis, sexual jealousy and its resulting behaviors emerged as a way for men to reduce the risk of being cuckolded. Thus, men in modern times are wired up to be jealous of sexual betrayal. Since women could always tell that an infant was indeed their own, they did not face the risk of cuckoldry. Therefore, they would not have needed to be specifically vigilant to a partner's sexual infidelity per se and would not have

developed a jealousy mechanism tuned to sexual infidelity per se. However, according to the JSIM hypothesis, ancestral women did face a different inclusive fitness threat: preventing a mate from giving his resources to other women and their children, which would decrease the likelihood of the woman's own children surviving and reproducing. Thus, JSIM proposes that jealousy over emotional betrayal evolved in women as a solution to losing resources. Inherent in this proposal is the assumption that a man's emotional involvement is a strong cue to his spending resources on another. Thus, modern-day men and women should be differentially jealous over a mate's sexual vs. emotional infidelity.

Initial survey research seemed to offer support for gender differences in line with predictions of JSIM (Buss et al., 1992). People were asked to imagine that they had a partner who was engaging in either sexual or emotional infidelity and then were forced to predict which infidelity type would be more upsetting. Studies using this method almost always find that relative to men, more women chose emotional infidelity as worse (e.g., DeSteno & Salovey, 1996b; Geary, Rumsey, Bow-Thomas, & Hoard, 1995; Harris & Christenfeld, 1996; see Harris, 2003a, for a review).

However, several lines of new research with other types of measures and with participants who have actually experienced a loved one's betrayal do not support the JSIM hypothesis. Hypothetical forced-choice measures have failed to show convergent validity. Such responses usually show no relationship with other measures of jealousy over hypothetical infidelity, psychophysiological indices, or with people's recalled reactions to a mate's past infidelity (Grice & Seely, 2000; Harris, 2000, 2003b). Notably, studies examining people's feelings over real infidelity (as opposed to hypothetical infidelity) generally do not find gender differences in jealousy. For example, one study with adults of a wide age range found that men and women, regardless of sexual orientation, focused more on the emotional aspects of their partner's actual betrayal relative to the sexual aspects (Harris, 2002). Two other studies also found that men and women had similar reactions to their mates' infidelity (Berman & Frazier 2005; Harris, 2003b). Another study (Buunk, 1981) found, contrary to JSIM, that wives more than husbands had greater negative perceptions of their spouses' affairs and were specifically more upset by thinking about their mate having sexual intercourse with another person (although participants were a somewhat exotic sample, namely, people who were attempting to have sexually open relationships). It remains somewhat of a mystery why the forced-choice questions about infidelity produce gender differences when more face-valid measures have not. Findings from several studies suggest that the dubious validity of hypothetical measures in this domain may partially be due to the evocation of complex inferential thinking and presentational concerns rather than immediate emotional reactions (DeSteno & Salovey, 1996b; DeSteno, Bartlett, Braverman, & Salovey, 2002; Harris, 2000, 2003a; Harris & Christenfeld, 1996; Sabini & Green, 2004).

These findings raise the question of why evolution would have failed to produce gender differences in jealousy over infidelity. Two ideas, not mutually exclusive, have been suggested. First, there may have been no need for sexually dimorphic jealousy mechanisms—a more general jealousy mechanism may have addressed the inclusive fitness risks faced by either gender (Harris, 2003a), which could be the case even if the JSIM theory is correct in its description of the unique adaptive problems faced by ancestral man and woman. The best way to avoid the inclusive fitness risks of cuckoldry or resource loss is to prevent a mate from ever getting to the point of engaging in sexual *or* emotional infidelity. Humans, like other animals, have mating rituals that occur before intercourse (i.e., flirting). The same flirtatious behaviors (smiling, eye contact, glances back and forth) may signal sexual interest, emotional interest, or both. These usually occur well before sexual intercourse or emotional commitment in modern times, and presumably in the ancestral past. Perhaps the most successful way for both sexes to prevent a partner's betrayal would be to be watchful for any of these common early warning signs. Taking preventative steps as soon as such behaviors occur between a mate and potential rival could prevent both sexual and emotional infidelity. This type of general jealousy mechanism is consistent with the emerging evidence that men and women have similar emotional reactions to sexual and emotional infidelity.

Second, the ancestral past may have been significantly different than the one envisioned in the JSIM hypothesis. In fact, very little is known for certain regarding the sociocultural environment in which humans evolved. One possibility is that infidelity may not have occurred at high enough rates to require the evolution of specific jealousy mechanisms. Theorists such as Miller and Fishkin (1997) argue that since human infants have a particularly long period of dependency on caregivers relative to most other species, they likely required extensive paternal investment. Males who formed deep emotional attachments to their mates and offspring may have been more likely to produce viable offspring for a variety of reasons (e.g., such bonds might reduce a woman's desire for another; and if a mate died in childbirth, these men would be more likely to stick around and raise their children to maturity, etc.) (see also Zeifman & Hazan, 1997, for other possibilities). A very different hypothesis is that the ancestral past of humans may have been like many hunter-gatherer societies of the present, where sharing and cooperation are emphasized. Thus, individual males may not have been responsible for providing resources to their own offspring since the group shared food resources (White & Mullen, 1989). Therefore, a man's inclusive fitness would not be as disastrously affected by cuckoldry as suggested in the JSIM theory.

Abuse and homicide

Several studies suggest that jealousy is one of the contributing factors involved in many cases of domestic violence. For example, Mullen and Martin (1994) found that more than 15% of the men and women surveyed in a community sample

reported that they had experienced physical aggression at the hands of a jealous lover. Women at shelters also often cite jealousy as the motive behind their partners' violence (Gayford, 1975). Jealousy can even lead individuals to kill the very people they love. It frequently ranks as the third or fourth most common motive in non-accidental homicides across cultures, including those as diverse as the Bhil of India, Basoga of Africa, as well as subcultures within the United States including Native Americans such as the Navajo (Betzig, 1989; Daly & Wilson, 1988; Felson, 1997; Harris, 2003a).

Early reports claimed that jealousy in men was a stronger motive for murder than in women (Daly et al., 1982). However, such work failed to take into account that men commit far more than their share of homicides of all types. Therefore, the difference in sheer numbers of jealousy-inspired murders could present a misleading picture. Two more recent studies have taken gender differences in overall murder rates into account and found a strikingly different pattern of results. Felson (1997) examined 2,060 homicides recorded in a database of 33 large urban U.S. counties and found that female murderers were significantly more likely to have been motivated by jealousy than were male murderers (approximately twice as likely). In a meta-analysis of murder motives in 20 cross-cultural samples (totaling 5,225 murders), Harris (2003a) found no overall sex difference. There was, however, a nonsignificant tendency for jealousy to be a more frequent motive for women murderers, which is consistent with Felson's findings. Thus, there is no reason to believe that jealousy is a disproportionate contributor to murder by males compared to females.

Pathological (morbid) jealousy

Sometimes jealousy takes such extreme characteristics that it is diagnosed as a clinical disorder referred to as "pathological jealousy" or "morbid jealousy" by psychiatrists (Shepherd, 1961). Jealousy in such patients is often due to delusional beliefs that a mate is cheating on them, although the diagnosis can also be given to individuals who exhibit an overly intense or exaggerated reaction to a real betrayal. People suffering from this disorder experience intensely negative feelings that are frequently accompanied by strong urges to spy on a partner. For example, an excerpt from a case study of jealousy by Wright (1994) illustrates how intense this state can be. "She exhibited a compulsion to ask her husband repeatedly if he had been unfaithful, and her day was dominated by behaviors to investigate this. For example, she would take all the phones out of the house when she was away to prevent her husband from calling another woman. She would mark his penis with a pen and examine it later to see if it had been touched. She would accompany her husband to work and stay in the car for hours at a time to stop any possible illicit liaison" (p. 431). Other case studies also vividly describe the extreme behaviors that patients with pathological jealousy will engage in. Stein, Hollander, and Josephson (1994) describe a patient who "made sure that all the

blinds in the house were closed to prevent men from looking in at his wife and insisted that his wife go to the beach fully clothed" (p. 31). Pathological jealousy can also motivate violent behaviors.

There are gender differences in the prevalence of pathological jealousy. A review of several large samples of pathological jealousy suggests that approximately 64% of the diagnosed cases involved male patients while only 36% of the cases involved female patients. At least some cases of pathological jealousy appear to be a form of obsessive-compulsive disorder (OCD). Of interest, OCD with sexual obsessions occurs about twice as often in men as it does in women (Lensi et al., 1996; Roy, 1979). Thus, one possibility is that pathological jealousy is a form of sexual obsession. Three separate research groups have reported successfully treating some pathological jealousy cases with fluoxetine, a serotonin reuptake blocker, which has also been found to be helpful with other forms of OCD (Stein et al. 1994; Wing, Lee, Chiu, Ho, & Chen, 1994; Wright, 1994).

New Methodologies for the Study of Adult Jealousy

The jealousy researcher confronts a particularly challenging problem: how to elicit jealousy experimentally. This hurdle is not easily overcome given that jealousy requires complex interpersonal situations. It is also ethically challenging, because damage to existing relationships could occur as a result of the jealousy manipulation. Given these issues, the vast majority of research on adult jealousy has relied on either hypothetical scenarios in which participants try to imagine themselves in situations and then attempt to predict how they might feel or react, or retrospective recall of jealous experiences. These lines of research clearly offer insights into jealousy as discussed in the previous sections of this chapter. However, such approaches also have limitations.

Reactions to hypothetical scenarios, particularly ones that do little to engage the participant, can be poor proxies for how people will feel and react in more real emotional situations. For example, there is a large literature on emotional forecasting that suggests that people are often inaccurate in predicting emotional feelings in a variety of situations ranging from missing a subway train to failing to get tenure (e.g., Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998; Wilson & Gilbert, 2005). Furthermore, as discussed previously, research specifically on jealousy suggests that people are particularly poor at predicting their emotions to completely hypothetical events involving infidelity.

The second method of studying jealousy, retrospective recall, has the virtue of being based on actual past emotional experiences, rather than participants' abilities to imagine people, relationships, and events that do not exist. However, recall is also subject to limitations such as potential memory failure or bias. Given the importance of jealousy, it is unfortunate that little research has experimentally manipulated it in controlled laboratory situations during adult interpersonal interactions.

Several methods have been developed to elicit jealousy in a real-time interactive way with infants and children as discussed in other chapters in this volume (see also Hart & Carrington, 2002; Hart, Carrington, Tronick, & Carroll, 2004; Hart, Field, del Valle, & Letourneau, 1998; Hart, Jones, & Field, 2003; Masciuch & Kienapple, 1993; Miller, Volling, & McElwain, 2000). However, very few studies exist that actively evoke jealousy among adults in real-time interactions due to logistical and ethical constraints. Fortunately, several new methods are being developed that may help enable researchers to actively elicit jealousy while minimizing potentially risky negative influences on the participant's actual relationships. Such methods range from intricately scripted face-to-face interactions to social rejection via computerized players.

DeSteno and colleagues (2006) have designed a sophisticated way of eliciting jealousy in the lab through orchestrated social encounters in which a participant is rejected by a partner (a confederate) in favor of a third person. (As noted earlier, rejection that triggers jealousy is proposed to be different from other forms of rejection in that it requires a social triangle and that one's interpersonal loss be another's gain.) The DeSteno and associates' experiments provided direct evidence that threats to self-esteem in a social triangle mediate jealousy. This work also found that participants who were rejected administered more unpleasant tastes (hot sauce) to both the rival and partner, which further documents the link between jealousy and interpersonal aggression.

Other recent work has also employed a rejection situation to induce jealousy in the lab (Harmon-Jones, Peterson, & Harris, 2009). In these studies, the participant played Cyberball—a cyber analogue of a ball-tossing game—with two computer-simulated players. Participants were able to select one of the two other players from a set of 8 female (or male) photos. They then played a Cyberball game while photographs of the selected player and another player of the same sex as the participant were displayed. After being included in the game for a few minutes, participants either continued to be included (control condition) or were ostracized (jealousy condition) by the player they had chosen earlier. When the ostracism occurred, the chosen partner's eyes, which were previously fixated on the participant, moved so that they now gazed at the third player. After the game, participants completed a questionnaire to assess emotions. Participants reported feeling the greatest amount of jealousy when ostracized rather than when included, and they felt more jealous when ostracized by an opposite sex partner as compared to a same-sex partner. A second study focused on the condition in which a male participant was rejected by the female partner in favor of another male to examine neural activity during the active experience of jealousy. Electroencephalograph (EEG) was recorded during the non-rejection and rejection periods and revealed that jealousy experiences were correlated with increased activity in the left frontal cortex.

Research on other emotions suggests that the brain's left hemisphere may play a particularly strong role in emotional states that lead to approach behaviors.

Although approach behaviors are often linked with positive emotions, they are also associated with the negative emotional state of anger, which can be contrasted with emotions associated with withdrawal behaviors such as fear or sadness. These data are consistent with the hypothesis that jealousy, at least initially, motivates one to engage in approach behaviors. Such behaviors might take the form of maintaining and reestablishing the relationship or may include active attempts at breaking up the threatening liaison. In work with infants, Hart and colleagues have also found that the most predictable response to jealousy evocation is approach behavior (Hart et al., 1998, 2004). Although infants show various types of negative affect (e.g., sadness, anger, fear), they show great consistency in mother-directed visual attention and proximity-seeking behaviors during jealousy evocation. Thus, several studies are consistent with the idea that jealousy is associated with action tendencies of approach.

A third new study (Harris, 2010) has focused on actively eliciting jealousy in romantic relationships that are already established. As noted above, inducing jealousy can be a potentially treacherous enterprise. If a participant witnesses a romantic partner flirting with a rival, then the effects of that flirtation on the primary relationship may last even after the experiment is over. The experimenter faces the challenge of how to elicit jealousy while ensuring that such manipulations do not have any long-lasting effects on the primary relationship. To overcome such obstacles, Harris has couples come in and then has one of them see a flirtatious computer dialogue that is purportedly occurring between the partner and another participant (a rival). In actuality, there is no rival and the partner merely types a script, which is supplied by the experimenter, into the computer. This paradigm has the advantage that jealousy is actively evoked yet potential harm to the primary relationship can be resolved at the end of the experiment. This is done by revealing that no third person actually existed and that the partner in no way engaged in flirtatious behaviors. A full debriefing at the end of the experiment as well as follow-up phone interviews later have disclosed no relationship harm. This experimental work has documented increases in physiological arousal during jealousy and has also shown that jealousy is often expressed by derogating the rival. These new interactive paradigms seem promising, although they too have limitations in the types and degree of jealousy that can be studied.

Concluding Remarks

In closing, this chapter has focused on theories, debates, and empirical research pertaining to adult relationships. Jealousy is a fundamentally social emotion with complicated underpinnings that can produce both functional and dysfunctional behaviors. At its most intense, it can have dire social and personal consequences as seen in the crime statistics and pathological jealousy cases. Even the less intense

forms of jealousy can have undesirable effects, as discussed earlier. One issue that remains open is to what degree extreme cases reflect the same underlying mechanisms that give rise to more common forms of jealousy. However, both theory and research suggest that jealousy may not produce unitarily negative effects. One prominent theory of the origins of jealousy is that it evolved to promote the maintenance and restoration of relationships that are threatened by potential rivals. Some of the empirical work covered in this chapter is clearly consistent with such a view. For example, people report that jealousy led them to make themselves more attractive to their partners and to attempt to secure greater relationship commitment (Mullen & Martin, 1994). Moreover, higher initial levels of jealousy were associated with a greater propensity to be in the same relationship 7 years later (Mathes, 1986).

This chapter has covered several of the factors that are associated with propensity toward jealousy and differential behavioral reactions to jealousy. However, getting tighter control on precisely when jealousy will occur and what factors make it detrimental or beneficial has been partially hindered in the adult domain by methodological limitations. We are optimistic that some of these barriers will be overcome with recent innovations in paradigms that elicit jealousy actively in interpersonal situations in the laboratory.

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