

Morbid jealousy as a function of fitness-related life-cycle dimensions

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Abstract: We suggest that morbid jealousy falls on the extreme end of a jealousy continuum. Thus, many features associated with normal jealousy will be present in individuals diagnosed with morbid jealousy. We apply Boyer & Liénard's (B&L's) prediction one (P1; target article, sect. 7.1) to morbid jealousy, suggesting that fitness-related life-cycle dimensions predict sensitivity to cues, and frequency, intensity, and content of intrusive thoughts of partner infidelity.

Jealousy is a universally experienced emotion proposed to be serving the adaptive purpose of preventing costly partner infidelity (Buss 2003). Jealousy mechanisms may exist on a normally distributed continuum, ranging from extreme hyposensitivity to extreme hypersensitivity (Buss 2000; Easton et al., in press). Individuals diagnosed with Delusional Disorder, Jealous Type (*Diagnostic and Statistical Manual of Mental Disorders*; American Psychiatric Association 2000) or "morbid jealousy" display this perceptual hypersensitivity and tend to exhibit extreme behaviors. These individuals incessantly accuse their partner of infidelity and often without actual verification (Kingham & Gordon 2004; Shepherd 1961). They monitor their partner's whereabouts by calling them incessantly, following their partner everywhere, and spying on their partner (Enoch & Trethowan 1979; Vauhkonen 1968). They show up unexpectedly at their partner's workplace or home. They use non-physical and physical abuse against their partner and may attempt to murder or actually murder their partner as a result of these intense and persistent feelings of jealousy (Buss 2000; Kingham & Gordon 2004; Mowat 1966).

If morbid jealousy is on an extreme end of a jealousy continuum, we hypothesize that individuals with normal jealousy and individuals diagnosed with morbid jealousy may experience many of the same intrusive thoughts and behaviors. As Boyer & Liénard (B&L) note, an important distinction lies not in the thought content but in the appraisal of those thoughts. Consistent with B&L's Precaution System Model, hypersensitive jealousy mechanisms may not be dysfunctional in all cases; in fact, by over-interpreting specific cues to partner infidelity, the mechanisms may serve the adaptive purpose of preventing partner infidelity. The perception, interpretation, and reaction to cues to partner infidelity may depend on specific contextual factors. We argue that the position of an individual along fitness-related life-cycle dimensions will predict the sensitivity to cues to partner infidelity and the frequency, intensity, and contents of intrusive thoughts of partner infidelity. These fitness-related life-cycle dimensions are experienced in a number of different ways.

It has been shown that men more than women are upset when asked to imagine their partner engaging in sexual intercourse with someone else, whereas women more than men are upset when asked to imagine their partner falling in love with someone else (Buss et al. 1992; Buss et al. 1999). Thus, men are more apt to display sexual jealousy whereas women are more apt to display emotional jealousy. We expect to find the same pattern in individuals diagnosed with morbid jealousy, such that a greater percentage of men than women diagnosed with morbid jealousy will focus on a partner's sexual infidelity, and that a greater percentage of women than men diagnosed with morbid jealousy will focus on a partner's emotional infidelity. Furthermore, we expect that men diagnosed with morbid jealousy will obsess on the details of a partner's sexual contact with other men and that women diagnosed

with morbid jealousy will obsess on the details of a partner's emotional contact with other women.

Research has also shown that men more than women report a potential rival's social status/wealth as a jealousy eliciting characteristic and that women more than men report physical attractiveness/youth as a jealousy eliciting characteristic in a potential rival (Brase et al. 2004; Buss et al. 2000). We expect to find the same thought pattern in men and women diagnosed with morbid jealousy. In fact, the intensity and frequency of these thoughts may vary as a function of fitness-related life-cycle dimensions. For example, a young man with few resources may be especially likely to focus on a rival's social status/wealth. An aging woman may be particularly attuned to the attractiveness/youth of potential rivals.

We also expect shifts in mate value in one partner relative to the other partner to predict sensitivity to cues of infidelity, and the intensity and frequency of jealous thoughts and feelings. Individual mate value can increase. One partner may experience sudden financial success, career advancement, or social status enhancement, or perhaps increased physical attractiveness through exercise, dieting, or cosmetic surgery. Individual mate value can also decrease. One partner may physically age faster than the other, become seriously ill, handicapped, or infertile. A career setback or a loss in social status may also decrease mate value. The individual with the newly acquired lower mate value may feel less attractive, sexually inadequate, or unworthy as a partner; and may now be perceived by their partner as an unworthy mate (Buss 2000). It may benefit those individuals with the lower mate value to attend to this discrepancy and to be more vigilant in their mate guarding efforts, including experiencing frequent and intense feelings of jealousy, increasing their sensitivity to cues of partner infidelity, and behaving accordingly to prevent partner infidelity.

Finally, we expect rates of actual partner infidelity to reflect the sensitivity to and the frequency, intensity, and contents of intrusive thoughts of partner infidelity. A diagnosis of morbid jealousy requires that the individual's partner is not or has not been unfaithful. However, if jealousy mechanisms are designed to perceive cues to partner infidelity, it is possible that these hypersensitive jealousy mechanisms are functioning as designed, that is, accurately detecting partner infidelity. Perhaps these persistent and obtrusive feelings of jealousy are grounded in reality. By not considering the functionality of jealousy mechanisms, clinicians may be too quick to dismiss the perception of their patients.

A complete understanding of morbid jealousy may come from examining morbid jealousy in relation to normal jealousy. We concur with B&L's Precaution System Model proposal that intrusive thoughts are generally not dysfunctional; and we offer that an examination of the individual context through fitness-related life-cycle dimensions may predict sensitivity to cues to partner infidelity, and the frequency, intensity, and content of intrusive thoughts of partner infidelity. The application of this model to morbid jealousy may help researchers and clinicians enrich their understanding of the disorder and thereby improve treatment of individuals diagnosed with morbid jealousy.

Critical developmental periods of increased plasticity program ritualized behavior

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Abstract: The consideration of humans going through sensitive periods of life, such as childhood and the early postpartum, may be helpful in understanding the cognitive and evolutionary puzzle of human rituals. During such periods, certain brain systems may mediate an increased susceptibility to learn new behaviors, rational or irrational.

The apparently irrational ritual behaviors discussed by Boyer & Liénard (B&L) may be related to the double-edged sword of having windows of increased plasticity. There is considerable evidence from epidemiology, ontogeny, ethology, and neurobiology that patterns of “normal” and adaptive ritual through childhood, romantic love, family life, and religious experience overlap with obsessive-compulsive disorder (OCD) (Feygin et al. 2006). During vulnerable periods, the capacity to recruit reward systems to motivate and learn survival behaviors without reasoned justification might confer significant evolutionary advantages. However, these periods might also render humans susceptible to irrational or psychopathological behaviors transmitted through the impact of comorbid psychopathology, culture and family.

Much of human behavior may be thought of as the result of reward-seeking or harm avoidance so that one might imagine behavior is based on an overall cost function associated to each action in which rational decisions are based on the conscious weighing of “pro’s and con’s.” However, when time is limited, stress is increased, or dangers are great, perhaps survival has evolutionarily favored brains that acted without rational review – that is, that performed rituals. Ritual behavior, then, would include behaviors that do not stand up to rational review, such as behaviors in which faith, rather than verifiable facts, determine actions. Children may represent a developmental window when threats are greater, cognitive capacity is lower, and perhaps even reward/learning circuits are primed to accept whatever they are told, with little rational review. Further, the behavior of children is influenced by the introduction of false positives and negatives. For example, children are told, and they accept, that if they do certain things then fictional entities such as Santa Claus or religious figures will be pleased and perhaps reward them. In the case of the Santa Claus myth, actual material rewards are provided by parents in addition to other parental caring behaviors. Alternatively, children may be threatened with negatives such as imaginary monsters or religious concepts like “hell” for failure to conform to whatever is required of them. Ideas of harm befalling a parent (reminiscent of OCD) may also be introduced. The capacity to be irrational, then, may be programmed during childhood to support a wide variety of fallacious cognitions that may go on to be part of rituals and OCD. It appears that a tendency toward magical thinking may underlie links between superstition and OCD severity (Einstein & Menzies 2004). In the case of religious beliefs, the acceptance of patently un-testable hypotheses (such as the nature of life after death) can even be rewarded, under the general guise of “faith.” It is an interesting observation that early-onset OCD is more severe (Rosario-Campos et al. 2001). It might be interesting to study the converse – that is, would a delay of ritual-based teachings to mid-late adolescence result in a decrease in ritual behavior and OCD?

As we might predict, then, increased religiosity (significantly mediated by childhood instruction) is associated with increased OCD. For example, Catholics with a high or moderate degree of religiosity scored higher on measures of OCD-related obsessional thoughts, compulsive washing, intolerance for uncertainty, need to control thoughts, beliefs about the importance of thoughts, and inflated responsibility, than did less religious Catholics (Sica et al. 2002). In another study using self-report questionnaires, differences in OCD-related phenomena between highly religious Protestants, moderately religious Protestants, and atheist/agnostic participants drawn from an undergraduate sample were studied (Abramowitz et al. 2004). Highly religious versus moderately religious Protestants reported greater obsession symptoms and compulsive washing. Also, compared with atheists and agnostics, the highly religious had more obsession symptoms, including compulsive washing, intolerance for uncertainty, need to control thoughts, beliefs about the importance of thoughts, and inflated responsibility. In another study of 45 outpatients with OCD, 42% of patients had religious obsessions (Tek & Ulug 2001). Relationships between religious

practices and OCD have also been reported among Hindus (Khanna & Channabasavanna 1988), Orthodox Jews (Greenberg & Shefler 2002), and Muslims (de Bilbao & Giannakopoulos 2005), underscoring the influence of particular religious affiliations on the expression of OCD.

It is likely that many brain systems are involved in ritual, including the fronto-striatal networks mentioned by B&L. Also of particular importance would be the reward systems that normally motivate various behaviors involved in learning and affiliation (Depue & Morrone-Strupinsky 2005). These might, however, be vulnerable to hijacking, such as in the acquisition of irrational, ritualistic, and pathological behaviors in OCD (Leckman & Mayes 1999), and addictions (Kufahl et al. 2005; Swain et al. 2005). Some of these systems have been shown to be activated in parents who are also undergoing a period of increased stress, learning, and preoccupation in the first few months after childbirth (Leckman et al. 1999). Several groups are also contributing to this field using different functional brain imaging experimental paradigms and populations (Swain et al., in press). These imaging studies hold the promise of identifying brain circuits associated with the formation of parent–infant attachment during the critical postpartum period. Some of these areas overlap with the ritual areas suggested by B&L and with OCD regions (Friedlander & Desrocher 2006). For example, first-time parents responding to their own infant’s cries versus those of other infants’ at 2 weeks postpartum, had activated basal ganglia, orbitofrontal cortex and caudate. These activations were also correlated with measures of OCD-like postpartum preoccupations.

Certain neurotransmitters may be critical to rituals. For example, CSF levels of the affiliative neuropeptide oxytocin are elevated in some individuals with OCD (Leckman et al. 1994). Another example is serotonin since serotonergic drugs are commonly used to treat OCD. In addition, serotonin has been associated with spiritual experiences (Borg et al. 2003), and OCD-related moral or religious scrupulosity can be effectively treated with serotonin reuptake blockers (Fallon et al. 1990). Indeed, much more research is needed on the common and distinct neural correlates of various OCD symptom dimensions with symptom provocation paradigms, combined with neuropsychological tasks and neuroimaging techniques. Certain groups that bear particular attention include “normal” subjects during critical periods such as childhood, or high stress.

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The evolved architecture of hazard management: Risk detection reasoning and the motivational computation of threat magnitudes

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Abstract: The architecture of the hazard management system underlying precautionary behavior makes functional sense, given the adaptive computational problems it evolved to solve. Many seeming infelicities in its outputs, such as behavior with “apparent lack of rational