



Cardiovascular indexes of threat impair responsiveness in situations of conflicting interests

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ABSTRACT

This research examined how situations in which self- and relationship-interests are misaligned can “get under the skin” to negatively impact cardiovascular and relationship processes. Interdependence theory was integrated with the biopsychosocial model of challenge and threat to better understand the biological processes that underlie relationship behavior in stressful circumstances. Couples engaged in a discussion in which one person (the *discloser*) revealed s/he had just gotten into her/his dream job or school and the other person (the *responder*) reacted to the news. Couples were randomly assigned to discuss living apart (self and relationship interests do not align) or together (self and relationships do align). Both responders and disclosers who discussed long-distance relationships *and* exhibited greater cardiovascular indexes of threat were behaviorally less responsive to their partners. Analyses also revealed that responders (regardless of conversation topic) who exhibited greater cardiovascular indexes of threat were less responsive. In addition to direct consequences for relationship processes and affective dynamics, these data implicate indirect pathways between relationship wellbeing and cardiovascular functioning.

1. Introduction

Individuals in relationships must carefully consider how their decisions will influence their partners. Situations in which self- and relationship-interests align are considered *correspondent* because decisions or choices that benefit the self also benefit the partner (Kelley and Thibaut, 1978). Alternatively, *noncorrespondent* situations arise when self-oriented interests clash with a partner's, and hence the relationship's, interests (Cavallo et al., 2013). Noncorrespondent situations represent a potent form of interpersonal stress where the stakes are high and responses have direct repercussions for relationship wellbeing and functioning (Rusbult and Van Lange, 2008). As we shall argue, biological responses in these situations play an important role in shaping interpersonal behavior.

The research presented here examined how seemingly positive news for one partner that conflicts with the other partner's interests may “get under the skin” to produce maladaptive physiological responses and relationship behaviors. To do so, we integrated two theories – the *biopsychosocial (BPS) model of challenge and threat* and *interdependence theory* – that have developed independently in the literature. Interdependence theory (Kelley and Thibaut, 1978; Rusbult and Van

Lange, 2008) focuses on interaction processes in various situations, such as noncorrespondence. The BPS model of challenge and threat (Blascovich and Mendes, 2010) provides a mechanistic framework for understanding how appraisals of demands and resources shape physiological and behavioral responses in stressful situations. Integrating these theories allowed us to investigate the biological processes that underlie dyadic responsiveness processes.

1.1. Interdependence theory

Within *interdependence theory*, noncorrespondent situations are considered ‘diagnostic’ of the state of a relationship because partners must choose between pursuing self-interests or doing what is best for the partner and relationship (Kelley and Thibaut, 1978; Rusbult and Van Lange, 2008). Extant research has focused almost exclusively on one specific type of noncorrespondence: Conflict, and the hostile behaviors that manifest therein (e.g., Murray et al., 2006; Rusbult et al., 1991). In particular, conflict is the only type of noncorrespondence that has been examined in biologically focused studies (e.g., Gottman and Levenson, 1992). This limited focus has produced conceptual ambiguity because conflict situations conflate noncorrespondence (misalignment

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of partners' interests) with valence (negativity). However, non-correspondence can also occur in more favorable situations that intertwine positive elements with conflict, such as when individuals have an opportunity to pursue a “dream job” away from their partners. The hostility typically associated with negative conflicts – arguments and disagreements – has been shown to produce specific physiological consequences: physiological linkage of heart rate, skin conductance level, pulse transmission time, and somatic activity (Levenson and Gottman, 1983) and larger increases in systolic blood pressure, heart rate, and cardiac output, and larger decreases in peripheral resistance and pre-ejection period (Nealey-Moore et al., 2007); however, less is known about the physiological consequences of noncorrespondence that is based on inherently more positive circumstances. In these situations, couples still must determine how to coordinate goal-directed activities in a way that does not damage the relationship (Van Lange et al., 1997).

For both partners, resolving noncorrespondence requires effort, entails uncertainty and personal cost, and compromises social coping resources (Baumeister et al., 1998; Cavallo et al., 2013; Murray et al., 2006; Reis and Arriaga, 2015). Appraising and addressing the demands and lack of social coping resources inherent in noncorrespondent situations is a dynamic, dyadic process (Kelley et al., 2003). For instance, an individual seeking to pursue her “dream job” in a distant location may feel uncertain about whether her partner will respond supportively. Her partner (the responder) must exert effort to respond constructively despite potential sacrifices and may also worry about abandonment. Appraisals of demands and resources in acute stress contexts like noncorrespondent situations directly impact cardiovascular responses, behaviors, and even downstream health outcomes (Blascovich and Mendes, 2010; Seery, 2011). However, little is known about how interpersonal, dyadic stress processes unfold within noncorrespondent situations. By integrating interdependence theory with the BPS model of challenge and threat, the research presented here seeks to elucidate how stress responses shape romantic relationship processes in vivo.

1.2. Biopsychosocial model of challenge and threat

When faced with stressful situations, appraisals of demands (e.g., perceptions of required effort, uncertainty, and danger) relative to coping resources (e.g., skills/ability, social support, and familiarity with the stressor) can directly determine downstream affective, behavioral, and physiological responses (Blascovich and Mendes, 2010; Jamieson et al., 2017). In challenge and threat theory, individuals experience approach-motivated challenge when coping resources are appraised as exceeding perceived demands. Alternatively, avoidance-motivated threat manifests when appraisals of demands outweigh resources. Notably, challenge and threat states are associated with patterns of physiological responding (for a biologically oriented review, see Mendes and Park, 2014) derived from activation of the sympathetic-adrenal-medullary (SAM) and hypothalamic-pituitary-adrenal (HPA) axes, mobilizing resources that enable individuals to respond to stressors.

Both challenge and threat responses are accompanied by SAM activation, leading to increased catecholamine levels, which increase ventricular contractility (decrease pre-ejection period and increase heart rate), constrict veins (facilitating return of blood to the heart), and dilate blood vessels (via the binding of epinephrine to beta-2 receptors, Brownley et al., 2000). Challenge-type responses, which are dominated by SAM activation, are thus characterized by increased cardiac output (CO) – the volume of blood pumped by the heart across a given period of time (usually 1 min.) – and decreased resistance in the peripheral vasculature (TPR). Challenge-type responses also allow for a rapid onset and offset of responses: resources are mobilized rapidly and individuals return to homeostasis quickly after stress offset.

In addition to activating the SAM axis, the experience of threat also strongly activates the HPA axis, which triggers the release of cortisol

from the *zona fasciculata* of the adrenal glands. Given the shorter half-lives of catecholamines relative to catabolic hormones such as cortisol (e.g., a few minutes versus over an hour, respectively), HPA activation is associated with a more prolonged stress response as cortisol lingers after stress offset. Because HPA activation tempers effects of the SAM axis, a threat response results in reduced (or little change in) CO and increased TPR downstream in the cardiovascular system (for reviews see Blascovich and Mendes, 2010; Seery, 2011).

Behaviorally, the physiological responses characteristic of challenge result in approach motivated behaviors, whereas threat promotes avoidance behaviors (Beltzer et al., 2014; Jamieson et al., 2013). For instance, research from the risk decision literature demonstrates that cardiovascular responses associated with challenge predict increased risk taking and more behavioral displays of anger, whereas threat responses predict more cautious decisions and behavioral displays of anxiety in adults (Jamieson et al., 2013).

How might these biological processes unfold during couples' interactions? The increased demands and lack of resources associated with noncorrespondent situations are hypothesized to promote threat-like affective states and corresponding physiological and motivational responses, and direct behavioral responses. That is, physiological responses diagnostic of challenge and threat not only have consequences for performance and decision outcomes (e.g., Blascovich et al., 1999; Jamieson et al., 2013; Jamieson et al., 2012), but also directly inform approach and avoidance behaviors in interpersonal contexts (e.g., Mendes and Koslov, 2013; Peters and Jamieson, 2016). To illustrate, interacting with a stigmatized partner elicited threat responses, which then lead to effortful overcorrections of positive behaviors enacted toward the partner (Mendes and Koslov, 2013). More directly related to relationship contexts, recent work has demonstrated that when one person suppressed (vs. expressed) affective displays, coders rated the suppressor as less responsive, both partners elicited stronger threat responses, and couples exhibited reduced intimacy behavior in a later task (Peters and Jamieson, 2016).

An integral part of constructive responses to partners in noncorrespondent situations is to be *responsive*—understanding, validating, and caring (Reis and Shaver, 1988). Responsiveness is generally inhibited during hostile conflict, but it also has been shown to influence partners' emotional outcomes when one of them receives good news (Gable et al., 2012). When experiencing threat, even in the face of good news, partners may be less able to reply responsively. Moreover, assessing threat with physiological measures has the important advantage of circumventing biases associated with self-reports (e.g., Blascovich and Mendes, 2010). Thus, when faced with a noncorrespondent situation, individuals who perceive that demands outweigh their coping resources (i.e., a threat state) should be less likely to engage in approach motivated, constructive relationship behavior: responsiveness (c.f., Neff and Karney, 2017).

1.3. Current research

The current research integrated interdependence theory with the BPS model of challenge and threat to help explicate the role of dyadic affective processes in relationship wellbeing and functioning (Rusbult and Van Lange, 2008). Our central hypothesis is that exhibiting physiological threat will impede responsive behavior, and this effect will be exacerbated when faced with a noncorrespondent (vs. correspondent) situation. Identifying physiological indicators of responsiveness in the absence of hostile conflict is an important area of inquiry given that the lack of responsiveness during noncorrespondent situations has been shown to thwart future attempts to be supportive and open, thereby contributing to relationship deterioration (e.g., Wieselquist et al., 1999).

To disentangle hostility and noncorrespondence, we created a novel paradigm in which one partner (the *discloser*) received hypothetical good news (offered her/his dream job or accepted into her/his dream

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