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Physiological and cognitive consequences of suppressing and expressing emotion in dyadic interactions

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ABSTRACT

Engaging in emotional suppression typically has negative consequences. However, relatively little is known about response-focused emotion regulation processes in dyadic interactions. We hypothesized that interacting with suppressive partners would be more threatening than interacting with expressive partners. To test predictions, two participants independently watched a negatively-valenced video and then discussed their emotional responses. One participant (the regulator) was assigned to express/suppress affective signals during the interaction. Their partner was given no special instructions prior to the interaction. Engaging in suppression versus expression elicited physiological responses consistent with threat—sympathetic arousal and increased vasoconstriction—in anticipation of and during dyadic interactions. Partners of emotional suppressors also exhibited more threat responses during the interaction, but not before, compared to partners of emotional expressors. Partner and interaction appraisals mirrored physiological findings. Emotional suppressors found the task more uncomfortable and intense while their partners reported them as being poor communicators. This work broadens our understanding of connections between emotion regulation, physiological responses, and cognitive processes in dyads.

1. Introduction

Imagine that you are debating politics with a close friend (always a pleasant endeavor). Although you may be frustrated that your friend disagrees with your point of view, you try to remain stoic rather than display your displeasure to keep the conversation from escalating into an argument. Or, during a poker game you get dealt a terrible hand but attempt to suppress your emotional response so as to potentially deceive your opponents and win the pot (i.e., bluff). As exemplified above, regulating emotional expressions via suppression is common in social situations (Gross and John, 2003).

A large corpus of research has accumulated demonstrating the effects of antecedent- and response-focused emotion regulation for individuals employing those strategies—the regulators (Gross, 1998, 2002; Gross and Barrett, 2011). However, emotion regulation does not occur in a vacuum. Social–situational factors must be considered. One social function of regulating emotion, especially response-focused strategies such as suppression, is to alter affective signals to others. For example, the person suppressing negative emotions about the political discussion attempts to signal to his friend that he is not dismayed by the differing viewpoint. Or, the poker player maintaining a neutral expression denies her opponents emotionally-relevant information that could be used to inform their behavior. Thus, emotion regulation can impact partners (those interacting with the regulators) as well as the regulators.

The dyadic nature of emotion regulation should be fully considered so as to best understand the effects of regulation on downstream outcomes. However, relatively little is known about how regulation strategies enacted by regulators impact outcomes in partners. The primary goal of the research reported here was to examine expressive suppression in vivo during a dyadic interaction with a focus on motivationally-tuned physiological measures and cognitive appraisals.

1.1. Emotion regulation

The process model of emotion regulation considers the dynamic nature of emotion (Gross, 2002). Experienced emotions can be regulated by altering underlying antecedent psychological, physiological, and situational mechanisms (i.e., the "ingredients" of emotion) occurring more upstream. For instance, altering cognitive appraisals of internal or situational signs of arousal can change subsequent affective experiences (Jamieson et al., 2013b; Mauss et al., 2007). In contrast, response-focused regulation strategies are implemented after emotions have been experienced; the most common strategy being suppression. The poker player in the example above suppressed displays of affect, but this suppression would not be expected to alter the negative affect felt

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from receiving the poor hand. The process model of emotion regulation makes a temporal distinction between regulation strategies. In the research presented here, we focus on response-focused regulation strategies. Suppression, as operationalized here, refers to inhibiting outward displays of affect.

Hallmarks of emotional suppression research are that suppression is effortful and does not alter felt affect because—by definition—it occurs after emotional experiences (Gross and Levenson, 1997; Gross, 1998; Harris, 2001). Downstream, suppression has been linked to myriad negative outcomes. For instance, suppression impairs memory processes (Dunn et al., 2009; Richards and Gross, 2000), predicts psychopathology (Haga et al., 2007; John and Gross, 2004; Moore et al., 2008), and elicits maladaptive physiological responses (Gross and Levenson, 1997; Gross, 1998; Hagemann et al., 2006) to name a few. Suppression also has negative social consequences, such as reducing access to social support resources, lowering "social satisfaction," and harming relationships (Amirkhan et al., 1995; Srivastava et al., 2009; Von Dras and Siegler, 1997). More long-term, engaging in suppression predicts weaker social connections (English et al., 2012). The extant literature—with exceptions in boundary conditions such as cross-cultural comparisons (Butler et al., 2009) and long-term adjustment in response to trauma (Bonanno et al., 2004; Seery et al., 2008)—illustrates that engaging in suppression has negative consequences for affective regulators.

On the other hand, comparatively little research has examined the effects of emotional suppression (and emotion regulation more generally) in partners (i.e., individuals who interact with regulators). Expression of emotion is crucial for interpersonal communication and, when disrupted, can have negative consequences for the interaction (Ben-Naim et al., 2013; Butler et al., 2003; Christenfeld et al., 1997; Glynn et al., 1999; Lepore et al., 1993; Lepore, 1995; Smith, 1992).

However, the specific physiological effects of suppression for partners of emotional regulators remain unclear. For instance, Butler et al. (2006) found that women who regulated their emotions (via reappraisal and suppression) during conversations exhibited increased respiratory sinus arrhythmia (RSA; indicative of increased vagal tone) and reports of negative affect compared to uninstructed controls. However, no differences in RSA emerged for partners who interacted with emotional regulators. This suggests that, at least in terms of parasympathetic nervous system (PNS) activity, partners may be minimally influenced by interacting with suppressive partners. Other research has found increases in blood pressure (BP)—frequently (but not always) diagnostic of sympathetic arousal—in partners who interacted with emotional suppressors (Butler et al., 2003). However, increases in BP can stem from multiple sources (e.g., contractile force of the heart or constriction/dilation of the vasculature), which can index different psychophysiological processes. Contractile force, for instance, increases with sympathetic arousal, but constriction/dilation modulates the delivery of oxygenated blood to the periphery and better maps onto motivational orientation. Additionally, in research with romantic couples, Ben-Naim et al. (2013) found that expressive suppression increased cardiovascular arousal (as indexed by a composite of physiological measures, including interbeat interval (IBI), skin conductance, finger pulse amplitude, finger pulse transit time, ear pulse transit time, and ear pulse amplitude). However, as touched on above, arousal does not directly map onto motivational orientation or affective state.

As outlined above, previous research has laid the groundwork for understanding the interactions between physiological responses and emotion regulation in dyads. The current research extends these findings by using motivationally-tuned physiological measures in a controlled dyadic emotion regulation context to help clarify the mixed physiological and affective findings for partners of regulators reported in previous research. Motivationally-tuned affective and physiological responses were examined in anticipation of and during social interactions in unacquainted, opposite-sex regulators and partners.

1.2. Stress and emotion regulation

Social interactions can be stressful. In fact, social evaluative situations are some of the most reliable means of instantiating stress in the laboratory (see Dickerson and Kemeny, 2004, for a review) and evaluative pressures are key components of social threats (cf. Jamieson and Harkins, 2010). Here, we conceptualize "social stress" as a social situation that disrupts homeostasis (allostasis) by presenting acute task demands that must be addressed. A social interaction in which one individual is suppressing her/his emotional expressions falls in this category. Regulators must expend resources in order to suppress, while partners seek to evaluate the verbal and (lack of) behavioral/non-verbal signals so as to respond accordingly. Examining physiological indexes of stress may provide a window into the affective mechanisms underlying dyadic emotion regulation.

The biopsychosocial (BPS) model of challenge and threat provides a theoretical framework for understanding how cognitive and situational factors interact to shape physiological responses in acutely stressful social situations (see Blascovich and Mendes, 2010, for a review). Briefly, when coping resources exceed situational task demands, individuals experience *challenge*. On the other hand, *threat* manifests when appraisals of demands exceed resources. These differential stress response patterns are important for understanding emotion regulation because they are accompanied by differences in motivationally-tuned physiological responses.

Physiologically, both challenge and threat states are accompanied by increased sympathetic nervous system (SNS) arousal. Challenge states elicit relatively greater sympathetic–adrenal–medullary (SAM) axis activation, increased cardiac efficiency (e.g., higher cardiac output, CO), and dilation of the peripheral vasculature (e.g., lower total peripheral resistance, TPR). Alternatively, threat is associated with relatively greater activation of the hypothalamus–pituitary–adrenal (HPA) axis, decreased cardiac efficiency (little change in or lower CO), and constriction of the peripheral vasculature (higher TPR). Motivationally, the physiological responses observed during challenge signal an *approach* orientation by preparing the body to actively address acute stressors, whereas threat responses signal an *avoidance* orientation in anticipation of damage and defeat (Jamieson et al., 2013a; Mendes et al., 2007, 2008). Couching predictions in the framework provided by the BPS model of challenge and threat will help clarify the limited, ambiguous physiological effects observed in the dyadic emotion regulation literature (Ben-Naim et al., 2013; Butler et al., 2003, 2006).

1.3. Current study

In the research reported here we examined the effects of response-focused emotion regulation on physiological and affective responses, and interaction and partner appraisals. Unacquainted (i.e. strangers), opposite-sex dyads first watched a video intended to induce negative affect. Then participants were informed that they would discuss their emotional reactions to the video with an unacquainted partner. One participant (the regulator) was instructed to either suppress or express outward facial and bodily displays of emotion, while the other partner was given no special instructions. Prior to beginning, partners prepared their thoughts in anticipation of the interaction. We predicted regulators instructed to engage in suppression would experience an anticipatory threat response as indexed by decreased PEP and increased TPR compared to expressive regulators.

The dyadic interaction also allowed for us to examine partners of suppressive and expressive regulators. During the interaction (but not during the anticipatory phase when regulators and partners had yet to meet), we predicted similar physiological and cognitive effects for partners of suppressive regulators. Partners who interacted with suppressive regulators were expected to exhibit more of a physiological threat pattern of responding (decreased PEP and increased TPR) and appraise