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THE IMPACT OF VALIDATING AND INVALIDATING RESPONSES ON EMOTIONAL REACTIVITY

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Along with individual factors, such as emotional reactivity and regulatory skill, a biosocial perspective of emotion regulation incorporates social factors, such as parent-child or romantic partner interactions, as key determinants of psychological outcomes. Consistent with this perspective, the current study tested whether two social factors, validating and invalidating responses, influenced affective and physiological reactions to stress while accounting for individual skill in regulating emotions. Hierarchical linear modeling demonstrated that participants exposed to invalidating responses experienced significantly higher levels of negative affect, heart rate, and skin conductance over time when compared to participants exposed to validating responses. Results are discussed as support for models incorporating social factors as key determinants of individual emotional reactivity and regulation.

Research on emotion regulation has shown a consistent relationship between how well individuals manage their emotions and a host of subsequent outcomes. To name a few, individuals who effectively regulate their emotions tend to have better physical health (Carre, Mittmann, Woodin, Tabares, & Yoshimoto, 2005; Gottman & Levenson, 1992; Kubzansky & Thurston, 2007), experience more positive

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affect (Gross & John, 2003), and report higher levels of relationship quality (Levenson, Carstensen, & Gottman, 1994; Meeks, Hendrick, & Hendrick, 1998; Wachs & Cordova, 2007). In contrast, individuals who lack emotion regulation skills or who use ineffective means to regulate emotions, such as emotional suppression or avoidance, are more likely to experience greater emotional reactivity (Gross & Levenson, 1997; Hayes et al., 1999) and several different forms of psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Southam-Gerow & Kendall, 2002). Thus, an important agenda in emotion regulation research has been to identify how emotion regulation strategies are acquired (Thompson & Goodvin, 2005), the implications and use of different strategies (Gross & Levenson, 1993), and how they can be applied in clinical interventions to improve psychological outcomes (Barlow, Allen, & Choate, 2004; Kirby & Baucom, 2007; Linehan, Bohus, & Lynch, 2007; Woodberry & Popenoe, 2008).

Toward this end, a considerable amount of research on emotion regulation has emphasized the individual aspects involved in modulating or changing an emotional reaction. For instance, Gross (1998, p. 275) defined emotion regulation as "the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions." Yet, individual factors may not be the only useful determinants of how a person reacts to or regulates emotions. Several important studies have shown a strong influence for interpersonal processes on the types of emotions individuals experience (Schachter & Singer, 1962) as well as their individual physiological reactions resulting from interpersonal conflict (Gottman & Katz, 2002; Laurent & Powers, 2007; Mirabile, Scaramella, Sohr-Preston, & Robison, 2009; Powers, Pietromonaco, Gunlicks, & Sayer, 2006). Interpersonal processes can also provide a context for the acquisition of emotion regulation skills and the socialization of emotional expression. For example, parents who respond to an emotional experience with warmth and attention tend to have children and adolescents who are more effective in regulating their own emotions (Eisenberg & Fabes, 1994; Shipman, Zeman, Penza, & Champion, 2000). The acquisition of regulatory skills can have a significant developmental effect whereby acquiring regulatory strategies in one context translates to desirable outcomes in another context. In romantic relationships for instance, individuals who communicate and effectively regulate their emotions tend to report higher levels of relationship satisfaction (Levenson et

al., 1994; Meeks et al., 1998), avoid engagement in interpersonal violence (McNulty & Hellmuth, 2008), and are more likely to remain in the relationship over time (Gottman & Levenson, 2002).

Perspectives that include both individual and social factors as determinants of emotion regulation (e.g., Diamond & Aspinwall, 2003) may provide additional insight into what factors influence emotional experiences, how individuals learn and regulate emotional reactions and how these factors may translate into psychological outcomes. One such perspective is that of Linehan (1993) and colleagues (Fruzzetti, Shenk, & Hoffman, 2005) who propose a biosocial theory of emotion regulation. According to this view, emotion regulation is shaped by three overarching factors: (1) one's reactivity or vulnerability to experiencing emotions, (2) the skill the individual has in regulating emotional reactions, and (3) interpersonal factors that impact a person's emotional reactivity and learning of skills for regulating emotions. Within this model, individuals are likely to develop difficulties in psychological functioning when they have frequent, large, and prolonged reactions to emotions, have insufficient skills for regulating such reactions, and are exposed to interpersonal processes that exacerbate such reactions and prevent learning of emotion regulation skills.

VALIDATING AND INVALIDATING RESPONSES

A validating response occurs when a person expresses his or her private experience to another person and this expression is met with understanding, legitimacy, and acceptance of this experience (Linehan, 1997). A validating response does not directly seek to change or alter a person's emotional experience. Instead, it seeks to highlight the emotional experience in order to facilitate an individual's acceptance and experiencing of the emotion. This validation can influence individual emotion regulation in several ways. First, validating responses are believed to minimize the frequency, intensity, and duration of an emotional reaction, especially those involving negative affect, making regulation more likely. Second, validating responses promote the learning of skills for regulating emotions because they promote more disclosures of emotional states which facilitate the experiencing of an emotion and consequently its expression and regulation (Fruzzetti & Shenk, 2008). Preliminary data suggest that interpersonal relationships involving higher levels of

validating responses are associated with lower levels of emotion dysregulation and current involvement in psychological treatment (Shenk & Fruzzetti, 2004).

An invalidating response on the other hand is "one in which communication of private experiences is met by erratic, inappropriate, and extreme responses. In other words, the expression of private experiences is not validated; instead it is often punished or trivialized" (Linehan, 1993, p. 49). Such a response conveys to an individual that his or her description of an emotional experience is incorrect and attributes that experience to socially unacceptable or undesirable standards. A biosocial model proposes that invalidating responses have a significant impact on emotion dysregulation by exacerbating an individual's emotional reactivity and by impeding an individual's ability to learn and use skills for regulating emotions. Over the course of time, invalidating responses interact with emotional reactivity and a lack of effective emotion regulation skills to contribute to the development of problematic psychological outcomes (Fruzzetti et al., 2005; Krause, Mendelson, & Lynch, 2003).

THE CURRENT STUDY

Validating and invalidating responses are important in a biosocial model because they are specific social processes purported to have an impact on individual emotional reactivity and regulation. However, the effect of validating and invalidating responses on emotional reactivity has not been tested. Thus, the current study is the first attempt at assessing the effects of validating and invalidating responses in a theoretically consistent manner. It was hypothesized that individuals exposed to validating and invalidating responses would demonstrate significantly different patterns of emotional reactivity. Specifically, under stressful conditions individuals receiving invalidating responses would demonstrate higher degrees of emotional reactivity as evidenced by greater emotional (negative affect) and physiological (heart rate and skin conductance levels) response when compared to those individuals receiving validating responses. Because this is an initial test of a model, a highly controlled, experimental design was implemented to strengthen conclusions about the effects of validating and invalidating responses on emotional reactivity. Specifically: (1) participants were randomly assigned to receive either validating or invalidating responses and

control for individual differences, (2) a multi-method assessment was employed and included self-report and physiological measures, and (3) repeated assessments were obtained to assess the effects of validating and invalidating responses on heart rate, skin conductance level, and negative affect, over time.

METHOD

SAMPLE

All participants (N = 60; 35 women) were recruited from undergraduate psychology courses where students received information about the study and had an opportunity to express willingness to participate. Participants responding to recruitment efforts signed up to complete the study via a university sponsored website advertising available times of participation for the study. Upon arrival to the laboratory, each participant received a detailed description of his or her role in the study before assessing inclusion and exclusion criteria. Inclusion criteria for the study were: (1) current enrollment (full or part-time) in an undergraduate psychology course, (2) a minimum of 18 years of age, (3) willingness to provide heart rate and skin conductance levels, (4) willingness to complete questionnaires, and (5) willingness to be videotaped. Exclusion criteria were active suicidal or homicidal ideation although no participants were excluded from the study. Participants meeting the inclusion criteria reviewed the consent forms for the study and were given time to ask questions or express concerns about their participation. Once all questions and concerns were addressed, participants then signed the consent form and began the study. Seventy-eight percent of the participants were Caucasian, 13% Latino, 5% African American, and 3% Asian. Average age for the total sample was 22.33 (SD = 6.94; range 18-55). See Table 1 for complete demographic information.

MEASURES

Self-Report

General Demographics Questionnaire. A demographics and health screening questionnaire was devised for this study to assess sample characteristics including age, sex, race, weight, current health functioning including exercise frequency, and dietary habits such

TABLE 1. Descriptive Statistics by Experimental Condition at Baseline

	Validating n or M (SD)	*Invalidating n or M (SD)*
Age	22.07 (5.85)	22.60 (7.97)
Sex		
Male	12	13
Female	18	17
Race		
Caucasian	26	21
African-American	1	2
Latino	2	6
Asian	1	1
PANAS-N	13.17 (3.19)	13.77 (4.24)
DERS	67.77 (12.30)	70.93 (14.31)
Heart Rate	77.94 (9.61)	79.59 (12.69)
Skin Conductance Level[1]	-1.49 (1.02)	-1.16 (0.79)

Notes. PANAS-P = Positive and Negative Affect Schedule-Positive Affect Subscale; PANAS-*N* = Positive and Negative Affect Schedule-Negative Affect Subscale; DERS = Difficulties in Emotion Regulation Scale; [1]Numbers are negative reflecting a reduction in skin conductance level during the baseline condition.

as caffeine consumption and smoking. Demographic and health screening information was obtained to assess group differences on variables known to influence physiological systems and affect.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item questionnaire assessing several aspects of emotion regulation: nonacceptance of emotions, difficulties engaging in goal-oriented behavior, difficulties with impulse control, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. The DERS has excellent internal consistency ($\alpha = .93$) and strong construct validity with other measures of emotion regulation (Gratz & Roemer, 2004). Internal consistency for the DERS in the current sample is $\alpha = .87$. The total score on the DERS represents an individual's overall difficulty in regulating emotions with higher scores reflecting greater difficulties. The total score was used in this study to indicate the level of skill an individual has for regulating emotion. Mean DERS scores for men ($M = 68.00$, $SD = 14.70$) and women ($M = 70.31$, $SD = 12.39$) suggest that the current sample had fewer difficulties in regulating

TABLE 2. Repeated Measures Design

Time	Experimental Condition
Time 0*	Baseline
Time 1	Mental Arithmetic 1-3
Time 2*	Validating or Invalidating Responses
Time 3	Mental Arithmetic 4-6
Time 4*	Validating or Invalidating Responses
Time 5	Mental Arithmetic 7-9
Time 6*	Validating or Invalidating Responses

Note. * = Positive and Negative Affect Schedule administered at these times following validating or invalidating responses. Physiological data collected during each condition.

emotions when compared to those participants in the Gratz and Roemer (2004) study.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a twenty-item self-report questionnaire assessing current positive and negative affective states as well as the subjective intensity of these states. Reliability of the PANAS in a nonclinical sample indicates the measure has strong internal consistency in both the positive (α = .89) and negative affect scales (α = .85) along with good concurrent validity with measures of depression and anxiety (Crawford & Henry, 2004). Intensity ratings for the negative affect scale of the PANAS were collected to assess changes in self-reported affect throughout the study. Only the negative affect scale of the PANAS was examined given its theoretical relevance to emotional reactions to stress, emotion regulation, and psychopathology. Internal consistency of the PANAS negative affect scale in the current sample ranged from α =.76 - .91 depending on the time it was administered (Table 2).

Observational

Validating and Invalidating Behaviors Coding Scale (VIBCS; Fruzzetti, 2001). The VIBCS is an observational rating scale used to measure levels of validating and invalidating responses between dyads. The VIBCS rating scale ranges from 1 to 7, with higher ratings indicating higher levels of validating or invalidating responses, where each person in the dyad is given a global rating for each set of responses. The VIBCS has demonstrated good inter-rater reliability

with an intra-class correlation coefficient (ICC) of .74. Interactions between experimenter and participant were video-recorded and coded for validating and invalidating responses. Given the focus of the present study, only the experimenter was rated for validating and invalidating responses. Ratings of validating and invalidating responses were used as a fidelity check to determine the extent to which participants in the validating condition received validating responses and participants in the invalidating condition received invalidating responses.

Physiological

Heart Rate. Heart rate was obtained using disposable Ag/AgCl electrodes affixed in a Lead II position. The frequency of peak R waves using a QRS detection algorithm was assessed at each experimental condition (Table 2). Heart rate was determined by averaging the frequency of R waves by the length of time in each experimental condition. The average heart rate for each experimental condition was then used in the statistical analysis of heart rate change.[1]

Skin Conductance Level. Raw skin conductance level (SCL) was recorded through digital electrodes placed on the distal phalanges of the second and third digits of the nondominant hand for each participant. Raw SCL data was amplified and digitally converted to microsiemens (μS) for online recording during the experiment. The mean SCL of each experimental condition was used in subsequent statistical analyses.[2] See Table 1 for descriptive data at baseline for all measures assessed.

1. Editing of artifacts in the IBI data stream consisted of integer arithmetic that involved dividing intervals when detections are missed or adding intervals when spuriously invalid detections occur. No more than 5% of IBI data collected was edited. Artifacts occurring in the SCL data stream (e.g., sneeze, hand movements) were noted and recorded during the experimental procedure and were removed offline.

2. Mean SCL was chosen over peak SCL given the use of both noninteractive (mental arithmetic) and interactive (exposure to validating or invalidating responses) conditions. There were few peaks in the SCL data stream during noninteractive tasks where peaks were observed during the interactive tasks. We used mean SCL because it incorporates the entire data stream, both gradual change and peak levels, in order to have a consistent metric across these conditions that most accurately represents skin conductance change over time.

PROCEDURE

Eligible participants completed the demographics form, the DERS, and the baseline PANAS assessment after consenting to participate in the study. During completion of the baseline questionnaires, participants were randomly assigned either to a validating or invalidating response condition using a blocked design that ensured an equal number of males in both validating and invalidating conditions. Sex was used as a blocking factor because differences have been observed in both physiological data collection (Venables & Mitchell, 1996) and in experiments using a cognitive stressor (Kudielka & Kirschbaum, 2005). After assignment to an experimental condition, participants were instructed to sit comfortably in a chair while the experimenter attached the physiological equipment. A baseline condition where each participant was asked to sit quietly and comfortably in a chair for 5 minutes determined resting levels of heart rate and SCL.

After obtaining resting levels of heart rate and SCL, participants completed the first of three sets of mental arithmetic problems. Mental arithmetic was used as a cognitive stressor to increase resting levels of heart rate and SCL. Mental arithmetic is a commonly used procedure to stimulate autonomic nervous system activity (e.g., Mathias, Stanford, & Houston, 2004) without significant harm to participants. Each participant, regardless of experimental condition, was administered the same nine mental arithmetic problems and had 40 seconds to complete each arithmetic problem or 2 minutes to complete a set of three problems. The experimental procedure followed a design where after completing a set of three mental arithmetic tasks participants were asked to describe their emotional state. Following this description, participants were exposed to validating or invalidating responses.

Once the participant described his or her emotional state, he or she was exposed to either validating or invalidating responses by the experimenter in order to assess the impact of these responses on emotional reactivity. This procedure involved an interactive process where participant disclosures were repeatedly met with either validating or invalidating responses. Examples of validating responses were, "Completing math problems without a pencil or paper is frustrating (if this was the emotion the participant disclosed)," "Most other participants have expressed the exact same feeling," and "I

too would feel upset if I were the one completing the task." Participants in the invalidating condition were exposed to comments such as, "I don't understand why you would feel that way," "There's no need to get upset," and "People were frustrated but not as much as you seem to be." The total length of exposure to each round of validating responses was 2 minutes, approximating the length of time given to complete each set of mental arithmetic problems. This pattern repeated a second and third time where participants completed a set of arithmetic problems, described their emotional experience, and then received a set of validating or invalidating responses. Heart rate and SCL were recorded continuously from the baseline assessment through the end of the experiment. The PANAS was completed at baseline and following each exposure to a set of validating or invalidating responses (see Table 2 for a summary of the repeated measures design employed in this study). Participants were fully debriefed about the purpose of the study following participation.

DATA ANALYTIC STRATEGY

Because the study employed random assignment to condition within a repeated measures design, hierarchical linear modeling (HLM; Bryk & Raudenbush, 1992) via SPSS v.15 was used to estimate both individual and average growth trajectories for negative affect, heart rate, and skin conductance. HLM is well-suited to assess individual and average levels of change in designs that use both random assignment and repeated assessments. Standardized effect size estimates (*ES*) can also be obtained in HLM models to assess magnitude differences in growth trajectories between groups over time (Raudenbush & Liu, 2001).[3] Linear and quadratic growth parameters were assessed for significance in the unconditional models for each dependent variable. The quadratic parameter did not reach significance for negative affect, heart rate, or skin conductance and thus only the linear parameter was retained in subsequent conditional models. The degree to which group membership (validating

3. Effect size estimates in HLM analyses were obtained using Raudenbush and Liu's (2001) equation. These estimates are scale-invariant, standardized measures of the effect-size magnitude between validating and invalidating conditions represented as a linear function of time and are interpreted as small, medium, or large effects analogous to traditional interpretations of effect sizes.

= 0; invalidating = 1) accounted for individual variation in average slope trajectories was then evaluated in the conditional models. Simple slopes were then probed to assess significant changes in trajectories over time for each experimental group.[4]

RESULTS

GROUP DIFFERENCES AT BASELINE

Comparisons were made between groups on demographic and health information, DERS and baseline PANAS scores. No significant differences between groups were observed on any demographic, dietary habit, or health functioning variable, the DERS or either the positive or negative affect subscales of the PANAS. Group differences were also assessed on resting levels of heart rate and SCL. Again, there were no significant differences between groups on either of the physiological measures at baseline. Overall, it appeared that the random assignment was effective in preventing significant group differences on self-report and physiological indices at baseline.

MANIPULATION CHECK—PHYSIOLOGICAL AROUSAL

Because the purpose of this study was to assess the impact of two different types of interpersonal responses on emotional reactivity, it was important to establish that the cognitive stressor was successful in stimulating such reactivity in comparison to resting levels. Only physiological variables were used as a manipulation check because the second administration of the PANAS occurred after delivery of the first set of validating and invalidating responses, thereby making it difficult to determine whether changes in negative affect were due to mental arithmetic or validating or invalidating responses. Therefore, physiological data collected up to, but not including, the first administration of validating or invalidating responses were

4. Supplemental HLM analyses were conducted to assess moderating effects for sex and individual skill at regulating emotions on negative affect, heart rate, and skin conductance. Neither sex nor DERS scores significantly moderated the impact of validating or invalidating responses on any of the outcomes. The lack of any moderating effects is likely due to randomization and a restricted range of DERS scores in the current sample.

used for the first manipulation check. Two paired-sample t-tests with a Bonferroni correction (α / 2 = .025) to control family-wise error determined if significant changes occurred in each of the physiological measures. Both heart rate, $t(59) = 5.47$, $p < .001$, and SCL, $t(59) = 10.68$, $p < .001$, increased significantly from the resting condition to the first set of arithmetic tasks. This finding suggests that the stressor used in this study was challenging enough to increase physiological activity so that the effects of validating and invalidating responses on emotional reactivity could be adequately assessed.

EXPERIMENTAL FIDELITY—VALIDATING AND INVALIDATING RESPONSES

Experimental fidelity was assessed to ensure that participants assigned to the validating condition received validating responses and participants assigned to the invalidating condition received invalidating responses. The VIBCS was used to determine the reliability of validating and invalidating responses. The experimenter's validating or invalidating responses were rated by trained observers who were blind to the participant's assigned condition. All members of the coding team rated an overlapping 25% of the entire sample to determine reliability. The ratings from this 25% of the sample were used to conduct a two-way, mixed-effects single-measure ICC with absolute agreement among coders. The resulting ICC was .94, $p < .001$, indicating excellent reliability among ratings of validating and invalidating responses (Shrout & Fleiss, 1979).

Once reliability was determined, separate between-group multivariate analyses of variance (MANOVA's) were performed to examine differences in the ratings of validating and invalidating responses between the experimental groups. A Bonferroni correction (α / 2 = .025) was applied when assessing significance to correct for family-wise error. Results from the MANOVA's indicated significant between-group differences on ratings of validating, $F(3, 56) = 266.36$, $p < .001$, partial $\eta^2 = .94$, and invalidating responses, $F(3, 56) = 162.64$, $p < .001$, partial $\eta^2 = .90$. Specifically, participants in the validating condition received significantly higher rates of validating responses and participants in the invalidating condition received significantly higher rates of invalidating responses. Overall, the fidelity check suggested that validating and invalidating responses

were reliably detected and validating and invalidating responses differed significantly between groups consistent with assignment to the respective experimental condition.

NEGATIVE AFFECT

It was expected that participants in the invalidating condition would demonstrate significantly higher levels of negative affect throughout the study when compared to participants in the validating condition. There was not a significant group x intercept effect, $b = .93$, $p = .36$, indicating that the two groups did not differ significantly on levels of negative affect at the baseline condition. There was however a significant group x linear slope interaction, $b = .13$, $p = .02$, $ES = .77$. This interaction suggests that increases in negative affect differed significantly over time as a result of group assignment. Specifically, participants in the invalidating condition reported significantly higher negative affect throughout the study when compared to those participants in the validating condition. The effect size estimate for this interaction indicates that there was a large difference in negative affect changes between the validating and invalidating conditions (see Figure 1). Simple slope analyses for the validating and invalidating conditions indicated that those individuals assigned to the validating condition did not experience a significant change in negative affect over time, $b = .15$, $p = .17$, where those assigned to the invalidating condition did experience a significant increase in negative affect, $b = .18$, $p < .001$.

HEART RATE

It was expected that participants assigned to the invalidating condition would demonstrate significantly increased heart rate throughout the study when compared to those individuals assigned to the validating condition. The group x intercept effect was not significant, $b = 1.28$, $p = .63$, indicating that heart rate for the two groups did not differ significantly during the baseline condition. There was a significant group x linear slope interaction, $b = .22$, $p < .001$, $ES = 1.10$, indicating group assignment significantly accounted for average levels of change in heart rate over time. In particular, participants in the invalidating condition had significantly increased heart

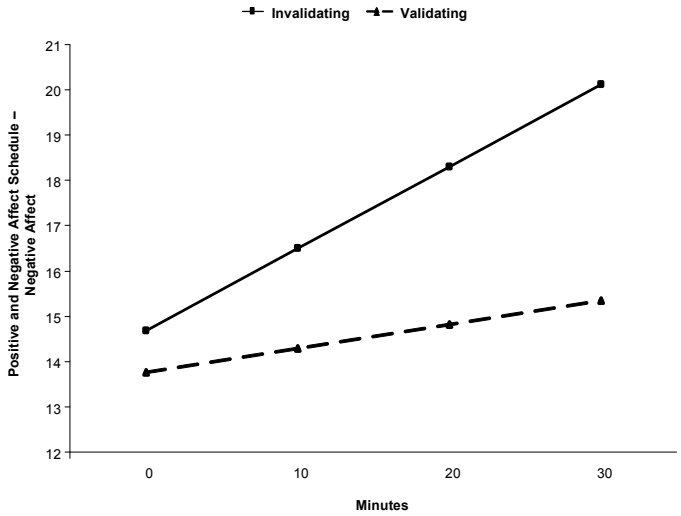

FIGURE 1. Predicted Values of Positive and Negative Affect Schedule – Negative Affect Subscale Obtained from Hierarchical Linear Modeling. Group x Linear Trend: b = .13, p = .02, ES = 0.77.

rate in comparison to participants in the validating condition. The effect size for this group x linear slope interaction was also large, suggesting substantial differences in heart rate between the two groups. Figure 2 demonstrates the varying growth in heart rate over time by experimental condition. Probing of simple slopes for individual group changes in heart rate over time indicated that those participants assigned to the validating condition experienced a significant decline in heart rate throughout the experiment, b = -.11, p = .01, where those assigned to the invalidating condition experienced a significant increase in heart rate throughout the experiment, b = .11, p = .01.

SKIN CONDUCTANCE LEVEL

Finally, it was expected that participants in the invalidating condition would experience significantly higher rates of SCL throughout the study when compared to participants in the validating condition. Again, there was not a significant group x intercept effect, b = .16, p = .66, indicating that there were no differences between groups on SCL during the resting condition. There was however a significant

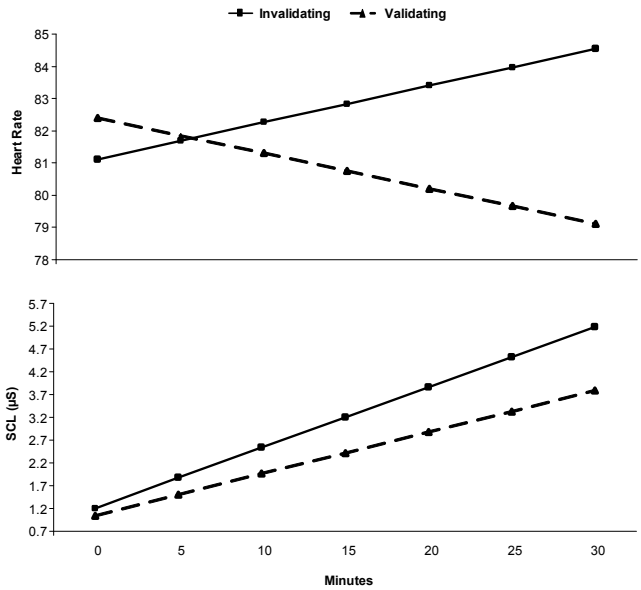

FIGURE 2. Predicted Values of Heart Rate and Skin Conductance Level Obtained from Hierarchical Linear Modeling. Group x Linear Trends: Heart Rate $b = .22$, $p < .001$, $ES = 1.10$; Skin Conductance Level: $b = .04$, $p = .03$, $ES = .73$.

group x linear slope interaction, $b = .04$, $p = .03$, $ES = .73$. As seen in Figure 2, the interaction effect illustrated that participants in the invalidating condition displayed significantly higher SCL in comparison to those individuals in the validating condition. This difference approached a large effect size difference by the end of the study. Assessment of simple slopes for SCL revealed that both the validating condition, $b = .09$, $p = .001$, and invalidating condition, $b = .13$, $p < .001$, experienced significant increases in SCL throughout the experiment. Cumulatively, results indicate that both experimental groups experienced significant increases in SCL over time although those in the invalidating condition had significantly steeper slopes when compared to those in the validating condition.

DISCUSSION

The current study tested the impact of validating and invalidating responses on emotional reactivity. This design allowed for a direct

test of the impact of validating and invalidating responses on emotional reactivity in a theoretically-informed manner while equating the two groups on skill for regulating emotions and sex. The results were consistent across all measures of emotional reactivity, including subjective and objective measures, and support a biosocial perspective that accounts for individual, interpersonal, and biological factors of emotion regulation. There are several advantages to the current study: (1) it employed an experimental design with random assignment to condition, (2) it used a multi-method assessment including self-report and physiological measures, and (3) it used advanced statistical modeling of repeated measures change in variables reflecting emotional reactivity. These advantages strengthen the conclusions made about the effects of validating and invalidating responses on emotional reactivity with noted implications for individual emotion regulation.

Validating and invalidating responses produced distinct trajectories of emotional reactivity across subjective and physiological measures consistent with current models of emotion regulation and dysregulation (Gross, 1998; Linehan, 1993). On average, participants in the invalidating condition had significantly higher levels of negative affect, heart rate, and skin conductance when compared to individuals in the validating condition. The effect of invalidating responses on emotional reactivity was evident in analyses comparing both between-group differences in emotional reactivity as well as within-group change relative to baseline. This pattern suggests that invalidating responses increase emotional reactivity during a stressful situation. Increased emotional reactivity resulting from invalidating responses may make regulation of such reactivity more difficult, especially for those individuals with limited emotion regulation skills, and potentiate the use problematic behaviors to reduce such reactivity (Brain, Haines, & Williams, 1998; Nock & Mendes, 2008). Despite completion of the same stressor paradigm, individuals in the validating condition reported nonsignificant changes in negative affect, a steady decline in heart rate, and a significantly lower trajectory of skin conductance level. This pattern suggests that validating responses minimized the effects of the stressor whether results are examined for between-group differences or for within-group change over time. Therefore, validating responses may be more conducive to the regulation of individual emotional reactivity even during a stressful situation. Cumulatively, these findings suggest that invalidating responses were more likely to elicit emotional

reactivity in a sample of individuals who, on average, reported being skillful in regulating emotions.

These results have clear implications for individual physical health as well. All participants in the current study completed a laboratory stressor that significantly increased heart rate and skin conductance level, both reliable indicators of autonomic activity. Although brief exposure to acute stress does not appear to have a long-term impact on cardiovascular functioning (Benschop et al., 1998), repeated exposure to stress or persistently elevated levels of physiological activity can have a significant negative impact on individual health (Lepore, Miles, & Levy, 1997). Invalidating responses prolonged the stress response in this study whereas validating responses appeared to attenuate it. This difference between the groups was most evident in levels of heart rate where people in the validating condition declined at a constant rate throughout the study even though they were repeatedly exposed to a cognitive stressor. Thus, in addition to regulating emotional reactivity, validating responses may also have a benefit to individuals under repeatedly stressful conditions. Exposure to validating comments may translate into better long-term physical health, especially when compared to individuals exposed to higher rates of stress and invalidating responses. Future research will need to more definitively examine this effect.

Although this study is cross-sectional and therefore long-term conclusions cannot be made, the findings derived from the repeated measures analyses suggest the effects of validating and invalidating responses on emotional reactivity may be more pronounced over time. People repeatedly exposed to invalidating responses may be more likely to experience emotional reactivity. This pattern may set the stage for prolonged negative affect or even mood difficulties, and without an effective individual repertoire for regulating such reactivity, engagement in problematic behavior or disruptions in interpersonal relationships may be more likely. In contrast, continued exposure to validating responses may be more likely to produce a trajectory where individuals are less reactive emotionally. This trajectory may also involve more frequent opportunities for individuals to learn skills for regulating emotions, further reducing emotional reactivity, and promoting better psychological health. Hence, the extent to which validating and invalidating responses affect emotional reactivity are likely to have important implications for individual emotion regulation and relationship functioning both in the short- and long-term.

In addition to the contributions of the current study, there are several limitations that warrant consideration. First, generalization to couples, parent-child dyads, and clinical populations is limited given the characteristics of the current sample. This study emphasized internal validity and used a relatively small, convenience sample to increase control over the administration of validating and invalidating responses to assess the function of validating and invalidating responses on emotional reactivity. Future research on validating and invalidating responses will need to involve samples with couples and parent-child dyads to extend the validity of the model beyond the sample used in this study. Second, a control condition where participants received neutral feedback during the stressor paradigm was not implemented. As a result, interpretations of the findings in this study pertain to the differences between validating and invalidating responses and not in comparison to neutral verbal responses. Third, although attempts were made to include a racially diverse sample, the current sample is predominantly Caucasian. Thus, the findings of the current study may be limited in its applicability to other racial groups. It must also be noted that these results are preliminary, that the study did not test all facets of a biosocial perspective, nor did it include a replication sample. Despite these limitations, the findings are suggestive and lend support to replication, further exploration, and research emphasis of biosocial and contextual perspectives of emotion regulation.

These findings support existing models of emotion regulation that emphasize interpersonal variables in the modulation of emotional reactivity and acquisition of emotion regulation skills. The current findings shed light into how parents and romantic partners may influence emotional reactivity, the learning of emotion regulation skills, and interventions for psychological outcomes. Given support for the hypotheses, altering the frequency and intensity of validating and invalidating responses may have a significant effect on the development and treatment of psychological and physical outcomes. If continued research substantiates such biosocial perspectives of emotion regulation, then enhancing validating responses, while decreasing invalidating responses, may have considerable utility as part of individual intervention efforts to improve emotion regulation. Overall, results from this study suggest that in addition to understanding the role of individual factors in emotion regulation, social factors also appear important in understanding how individual emotional reactivity and regulation is influenced

and how interventions might be shaped to improve psychological outcomes.

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