

EMOTION REGULATION AND PERCEPTIONS OF HOSTILE AND
CONSTRUCTIVE CRITICISM IN ROMANTIC RELATIONSHIPS

by

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A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Psychology

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Dedication

This dissertation is dedicated to my parents, Andrea and Norman Klein, for their constant love and support.

Acknowledgements

I would like to thank my advisor, Keith Renshaw, for his dedication to my development as a clinical psychologist and his fantastic mentorship. I also thank the members of my committee, Timothy Curby and Sarah Fischer, for their invaluable feedback on this dissertation. I sincerely appreciate the research assistants of the Anxiety, Stress, and Relationships Lab, who assisted with data collection for this study. Finally, I offer thanks to my family and friends for all of their love and encouragement.

Table of Contents

	Page
List of Tables	vi
Abstract	vii
Introduction	1
Method	7
Participants	7
Measures	7
Procedure	11
Analytic Plan	12
Results	16
Predictions of Perceived Constructive Criticism	22
Predictions of Perceived Hostile Criticism	25
Discussion	31
Appendix	39
References	75

List of Tables

Table	Page
Table 1	17
Table 2	18
Table 3	19
Table 4	21
Table 5	22
Table 6	23
Table 7	24
Table 8	25
Table 9	26
Table 10	27
Table 11	28
Table 12	29

Abstract

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George Mason University, 2015

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Perceptions of hostile criticism (PHC) from close others in relationships are associated with poor relationship and individual functioning, whereas perceptions of constructive criticism (PCC) are associated with better relationship satisfaction. To date, however, there is little empirical knowledge regarding the factors that contribute to perceptions of hostile vs. constructive criticism. Emotion regulation skills and strategies are related to social and communication outcomes and, thus, may be important predictors of PHC and PCC. The present study examined associations of overall difficulties in emotion regulation, as well as the specific use of expressive suppression and cognitive reappraisal strategies, with PHC and PCC in the context of romantic relationships. Both partners of 63 community couples provided self-reports of emotion regulation, PCC, and PHC via global questionnaires. Sixty-one of these couples then attended a laboratory session and completed similar measures immediately following each of three discussions about relationship and individual problems. Multilevel modeling was used to account for

the nesting of individual ratings within couples for global measures and for the nesting of discussion ratings within individuals within couples for discussion measures. Individuals' global reports of PHC were higher when both they and their partners reported greater difficulty in emotion regulation and when they used more suppression. Participants reported higher PHC in discussions when both they and their partners reported using more suppression and when they had more difficulties in emotion regulation during the discussions. Individuals reported higher levels of global PCC when their partners reported using less suppression. Finally, participants reported higher levels of PCC in discussions when they reported using more reappraisal and when their partners reported using less suppression. Results suggest that couples interventions may be more effective in reducing PHC if they aim to enhance partners' overall skill in emotion regulation and specifically reduce reliance on expressive suppression. Cognitive reappraisal also may be a useful strategy to enhance couples' PCC in appropriate contexts, such as discussions of problems. Finally, therapies may help couples by increasing awareness that one's own emotion regulation strategies are connected to one's partner's PCC and PHC.

Introduction

Emotion Regulation and Perceptions of Hostile and Constructive Criticism in Romantic Relationships

Criticism is generally considered to be negative in the interpersonal realm. It is one of four main negative interpersonal behaviors that predict divorce (Gottman, 1993, 1994). Greater levels of perceived criticism from partners are associated with relationship dissatisfaction in both community couples and couples with a member with anxiety/mood disorders (e.g., Chambless & Blake, 2009; Hooley & Teasdale, 1989). Furthermore, the amount of criticism and hostility expressed by relatives regarding patients has been consistently related to worse treatment outcome and relapse in schizophrenia, mood, and eating disorders (see meta-analysis by Butzlaff & Hooley, 1998). Similarly, perceived criticism from close relatives or romantic partners is a reliable predictor of worse treatment outcome and a worsening of symptoms for several psychological disorders (see review by Renshaw, 2008). Thus, having a partner who is critical (or, at least, who is perceived as critical) is generally related to worse personal and relationship functioning.

Despite these findings, some research suggests that the effects of criticism are not so straightforward. The manner of delivery and content of criticism appear to be especially important. For example, when criticism and overt hostility from relatives are

examined simultaneously, criticism is predictive of *better* outcomes for individuals undergoing exposure-based therapy for an anxiety disorder, whereas observed hostility is related to poorer treatment outcomes (Chambless & Steketee, 1999; Peter & Hand, 1988; Zinbarg, Lee, & Zoon, 2007). Some authors have thus suggested that nonhostile or constructive criticism from a partner helps people to approach difficult tasks like exposure therapy (e.g., Renshaw, Steketee, Rodrigues, & Caska, 2010). A closer examination of perceptions of criticism revealed that general perceptions of criticism in relationships are more specifically related to perceived *hostile* criticism, whereas perceived nonhostile or constructive criticism appears to be a distinct construct (Peterson & Smith, 2010; Renshaw, Blais, & Caska, 2010). Specific perceptions of hostile criticism also are more strongly, negatively related to relationship satisfaction than general perceptions of criticism (Renshaw et al., 2010), whereas perceptions of constructive criticism are moderately, *positively* related to satisfaction in multiple types of relationships (Campbell, Renshaw, & Klein, 2015; Renshaw et al., 2010).

Thus, it appears that perceived hostile criticism is particularly detrimental to couple functioning and personal mental health. In contrast, perceived constructive criticism has the opposite effect, as it is not simply neutral, but even associated with greater relationship satisfaction. However, these constructs themselves are not simply opposite ends of the same continuum. Studies of the close relationships of three separate samples of undergraduates found that perceived constructive and hostile criticism are only moderately negatively correlated ($r = -.33, -.09$ in Campbell et al., 2015; $r = -.37, -.59$ in Renshaw et al., 2010), suggesting that they are related but independent constructs.

Therefore, the factors that underlie individuals' perceptions of constructive vs. hostile criticism may inform our understanding of couple functioning.

How partners deliver criticism is certainly one potential element, but to fully understand partners' *perceptions*, other individual characteristics may be important. One likely influence on whether people perceive their romantic partners' criticism as hostile or constructive is the manner in which people regulate their emotions. Emotion regulation refers to "the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998a, pp. 275). Empirical research suggests an important role of emotion regulation in communication, interpersonal perceptions, and satisfaction. Overall emotion dysregulation is associated with greater self-reported tendencies to use problematic interpersonal styles and less social problem-solving (Turner, Chapman, & Layden, 2012), fewer reported displays of positive and negative emotions (Gratz & Roemer, 2004), and less objectively observed expression of positive emotion (Feng et al., 2009). People with disorders characterized by emotion dysregulation in comparison to controls also tend to judge others' behavior as less positive, more negative, and more aggressive (Barlow et al., 2009).

More specifically, much research on emotion regulation has focused on the use of specific emotion regulation strategies, particularly *expressive suppression*, which is the inhibition of verbal and nonverbal expression of emotions that have been generated, and *cognitive reappraisal*, defined as changing interpretations of an event to change the emotional response (Gross, 1998a, 1998b). Studies of expressive suppression suggest that

it is associated with perceptions of less social support and closeness to others (Gross & John, 2003; Srivastava, Tamir, McGonigal, John, & Gross, 2009) and less marital satisfaction in both partners in a couple (Feeny, 1999). Suppression also appears to limit the expression of appropriate affiliative behaviors, particularly expressions of emotion and responsiveness, in interactions with others (Butler et al., 2003; Butler, Lee, & Gross, 2007; Gross & John, 2003; Richards, Butler, & Gross, 2003). In addition, it has been linked to greater expressions of contempt and disgust in both members of couples (Ben-Naim, Hirschberger, Ein-Dor, & Mikulincer, 2013), hostile perceptions of the individual using suppression, and less friendly behavior from others in interactions (Butler et al., 2007). Finally, some studies have linked suppression with perceptions of communication from parents as lower in quality or caring (Cheung & Park, 2010; Jaffe, Gullone, & Hughes, 2010). Alternately, cognitive reappraisal is generally associated with more experience and expression of positive emotion, less experience and expression of negative emotion, greater perceptions of closeness and likeability by others (Gross & John, 2003), better social problem solving (Turner et al., 2012), and greater perceptions of caring behavior from parents (Jaffe et al., 2010). These findings suggest that suppression disrupts intimacy-enhancing communication and leads to negative social perceptions of others and by others, whereas cognitive reappraisal enhances emotional communication and leads to positive perceptions of others and by others.

Though no specific studies were identified regarding how individuals' emotion regulation affects their *perceptions* of their romantic partners' communication, theory and some research suggests that biased cognitive construals of events may influence and be

influenced by emotion regulation (e.g., Barnow et al., 2009; Beck, Freeman, & Davis, 2004; Joorman & D'Avanzato, 2010). Also, higher perceived criticism has been associated with differential brain activation in areas associated with emotion reactivity and regulation (increased amygdala and decreased prefrontal activity) when criticism is heard (Hooley, Siegle, Grueber, 2012). Thus, it might be expected that poor emotion regulation (in general and via suppression) would activate neurological, physiological, and cognitive processes that would increase the likelihood of interpreting a romantic partner's communication, particularly criticism, in a more negative and less positive light (i.e., as more hostile and less constructive), even when that communication is well intentioned. In contrast, more adaptive emotion regulation (in general and via reappraisal) might influence calmer physical and cognitive processes that would allow for more positive and less negative assessment of a partner's communication, thus perceiving more constructive and less hostile criticism from a romantic partner.

The current study focuses on how emotion regulation of both partners in a romantic relationship relates to their perceptions of hostile and constructive criticism from their partners. To evaluate emotion regulation and perceptions at both momentary and general levels, perceptions of criticism and emotion regulation were assessed both globally and specifically in response to a series of three discussions. Data were collected from both partners in a couple, with assessment of both overall difficulties in emotion regulation as well as use of the specific techniques of expressive suppression and cognitive reappraisal. I hypothesized that people with poorer emotion regulation, greater use of suppression, and less use of reappraisal would perceive less constructive and more

hostile criticism from their partners in general and in specific discussions. I also hypothesized that the *partners* of such individuals would perceive less constructive and more hostile criticism from them in general and in specific discussions.

Method

Participants

Participants were 63 heterosexual couples (i.e., 126 individuals) from the Northern Virginia community in long-term, committed relationships. Forty-two were married and cohabiting, 20 were unmarried and cohabiting, and one couple was not cohabiting but had been in their relationship for 5 years. Participants had been in a relationship for a mean of 8.56 years ($SD = 8.64$), with a minimum of 1 year and a maximum of 44 years. Participants had lived together for a mean of 6.79 years ($SD = 8.81$), ranging from 1 month to 43 years. Of those who were married, the average length of marriage was 8.06 years ($SD = 9.56$), ranging from 3 months to 43 years.

Participants tended to be young to middle-aged adults ($M = 33.16$ years old, $SD = 10.66$ years). The sample was relatively diverse: 59.5% of the sample identified as Caucasian, 11.9% were Black, 11.1% were of Asian descent, 9.5% were Latino/Hispanic, 4% identified as bi- or multiracial, and 4% were “other.” Participants were also relatively educated, with 38.9% reporting their highest level of education as college degrees, and 36.5% reporting graduate school degrees.

Measures

Perceived Criticism Measure (PCM; Hooley & Teasdale, 1989) and PCM-Type (PCM-T; Renshaw, Blais, & Caska, 2010). These combined questionnaires include six 1-item measures that assess perceptions of general criticism, hostile criticism, and non-hostile/ constructive criticism received from and given to one's romantic partner, on a scale from 1 (*not at all*) to 10 (*very*). These singular items have acceptable test-retest reliability and strong convergent and predictive validity; the PCM shows this even in comparison to other longer measures or interviews (Chambless & Blake, 2009; Hooley & Teasdale, 1989; Renshaw, 2008; Renshaw et al., 2010). The questions were administered at the global level and after each discussion, modified to be specific to the discussion that just occurred. The two items for perceived constructive (PCC) and hostile criticism received from one's partner (PHC) were used for this study. No participants were missing responses to these items at the global level. There was a very small amount of missing data on these items in the 366 discussions, with 1 rating of PCC (0.3%) and 2 ratings of PHC (0.5%) missing.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004).

This measure assesses the extent to which people have difficulty regulating their own emotions. Respondents rate how often the 36 items apply to themselves on a scale from 1 (*almost never*) to 5 (*almost always*). The measure provides a total score and also has six subscales measuring different dimensions of emotion regulation: nonacceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. The total score, which was the focus of analyses, has

demonstrated excellent internal consistency (Cronbach's $\alpha = .93$) and good test-retest reliability and convergent validity (Gratz & Roemer, 2004). The standard DERS was included in the global measures, with excellent internal consistency in our sample (Cronbach's $\alpha = .92$). There was a relatively small amount of missing data on this measure at the global level, with 10 participants (7.9%) missing 1 item and 1 participant (0.8%) missing all 36 items. For those missing 1 item, an extrapolated total score was computed, replacing the missing items with the mean of all other items. This extrapolated score was used in all analyses.

Given that there is not a brief measure of momentary difficulties in emotion regulation skills assessed by the DERS, I modified and shortened the DERS for use after each discussion. Two representative items from each subscale (selected for face-validity) were rephrased to relate to the discussion that had just occurred (e.g., "When I was upset, I took time to figure out what I was really feeling"), forming an exploratory 12-item measure that was administered after each discussion. This modified version of the DERS had acceptable internal consistency across all three discussions (Cronbach's $\alpha = .80$ for Discussion 1, .70 for Discussion 2, and .68 for Discussion 3). There was a small amount of missing data on this measure in the post-discussion questionnaires. Of the 366 total discussion ratings (3 discussions rated by both members of 61 couples), 1 item was missing from the questionnaire after 16 discussion ratings (4.4%), 2 items were missing from the questionnaire after 2 discussion ratings (0.5%), and the full measure was missing after 1 discussion rating (0.3%). For those questionnaires after discussions

missing 2 items or fewer, an extrapolated total score was computed, replacing missing items with the mean of all other items. This extrapolated score was used in all analyses.

Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). This 10-item questionnaire assesses the general use of two strategies for regulating emotions: cognitive reappraisal and expressive suppression. Respondents rate how much they agree that the items refer to their own style of dealing with their emotions on a scale from 1 (*strongly disagree*) to 7 (*agree completely*). The two subscales show adequate to good reliability (averaged for four samples, Cronbach's $\alpha = .79$ for reappraisal, $\alpha = .73$ for suppression) and good convergent, discriminative, and predictive validity (Gross & John, 2003).

The standard ERQ was included in the global measures and after each discussion (modified to be specific to the discussion that had just occurred). Given the brevity of the ERQ, all 10 items were used in the discussion-specific version of the scale. At the global level, reliability was good for both subscales (Cronbach's $\alpha = .85$ for reappraisal, $\alpha = .82$ for suppression). Similarly, internal consistency was good at the discussion level for both suppression (Cronbach's $\alpha = .85$ for Discussion 1, $.79$ for Discussion 2, and $.83$ for Discussion 3) and reappraisal (Cronbach's $\alpha = .86$ for Discussion 1, $.92$ for Discussion 2, and $.90$ for Discussion 3). There was a small amount of missing data on this measure at the global level, with 2 participants (1.6%) missing 1 item, and 1 participant (0.8%) missing all 10 items. There was also a small amount of missing data on this measure after the discussions, with 1 item missing from the questionnaire in 9 of 366 total post-discussion ratings (2.5%). Given the small number of items used to calculate each

subscale (6 for cognitive reappraisal and 4 for suppression), however, extrapolated scores were not calculated.

Procedure

All procedures were approved by a university Institutional Review Board. Couples were recruited via fliers in public locations (e.g., outdoor malls, billboards at universities) and advertisements in newspapers (Washington Post), online forums (e.g., Craigslist), or other Internet-based venues (e.g., listserves), as well as some recruitment via word-of-mouth from participants. Before visiting the laboratory, participants completed the PCM and PCM-T, DERS, and ERQ online (among other measures as part of a larger study) regarding their life and relationship in general.

Subsequently, participants visited the laboratory and engaged in three discussions with their partner. They discussed a problem in their relationship for 8 minutes, and then, for 4 minutes each, they alternated discussing a problem one of them was facing individually. These three discussions were based on the problem solving and social support discussions originally developed by Pasch and Bradbury (1998), which are frequently used in research with couples. Here, they were intended to elicit a range of both types of criticism. After each discussion, both partners separately filled out brief questionnaires regarding their experience in the discussion, including discussion-specific versions of the PCM and PCM-T and the modified discussion-specific DERS and ERQ. The entire process took approximately 2 hours. Each couple received compensation of \$40 and two movie ticket vouchers.

Analytic Plan

I analyzed the global questionnaire data using 2-level models, with 126 individuals nested within 63 couples. I analyzed the discussion level data with 3-level models, with 366 discussions nested within 122 individuals nested within 61 couples, since two couples only completed global questionnaires but did not come into the lab for the discussion portion. I used an overarching actor-partner interdependence model (APIM; Kashy & Kenny, 2000) approach, using the HLM instructions by Campbell and Kashy (2002) to examine actor and partner effects of emotion regulation on each type of perceived criticism. For all analyses, continuous variables were entered into the equation grand-mean centered. In all HLM analyses, the standardized Level 1 residuals were examined for normality, homoscedasticity, outliers, and homogeneity of variance. If outliers were found in visual examination of residuals (as recommended in Garson, 2013), the models were tested with and without outliers. However, removal of potential outliers resulted in minimal changes in patterns of results. Thus, for simplicity, results reported below include all cases.

Global and discussion level ratings of perceived hostile criticism (PHC) showed positively skewed distributions. The optimal transformation for the global-level rating of PHC appeared to be a logarithmic transformation, and the optimal transformation for the discussion-level ratings of PHC was a reverse inverse transformation. These transformations led to variables that demonstrated acceptable distributions with regard to assumptions of normality; thus, all analyses of PHC used these transformed variables.

The specific analyses for the hypotheses are presented below. It was hypothesized that actor (designated by subscript ‘a’) and partner (designated by subscript ‘p’) difficulties in overall emotion regulation, as assessed by the total score on the DERS, would negatively predict PCC and positively predict PHC. The following equations were used for global data with the outcomes of PCC and PHC separately:

$$\text{Level 1 (individuals): } y_{ij}(\text{PCC}_a \text{ or } \text{PHC}_a) = \beta_{0j} + \beta_{1j}(\text{DERS}_a) + \beta_{2j}(\text{DERS}_p) + r_{ij}$$

$$\text{Level 2 (couples): } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

The equations for the discussion-level data (indicated by “D” following the variable name) were used with the outcomes of PCCD and PHCD separately:

$$\text{Level 1 (discussions): } y_{ijk}(\text{PCCD}_a \text{ or } \text{PHCD}_a) = \pi_{0jk} + \pi_{1jk}(\text{DERSD}_a) +$$

$$\pi_{2jk}(\text{DERSD}_p) + e_{ijk}$$

$$\text{Level 2 (individuals): } \pi_{0jk} = \beta_{00k} + r_{0jk}$$

$$\pi_{1jk} = \beta_{10k}$$

$$\pi_{2jk} = \beta_{20k}$$

$$\text{Level 3 (couples): } \beta_{00k} = \gamma_{000} + u_{00k}$$

$$\beta_{10k} = \gamma_{100}$$

$$\beta_{20k} = \gamma_{200}$$

It was also hypothesized that actor and partner cognitive reappraisal, as assessed by the ERQ reappraisal subscale (ERQR), would positively predict PCC and negatively predict PHC. Finally, actor and partner expressive suppression, as assessed by the ERQ

suppression subscale (ERQS), were expected to negatively predict PCC and positively predict PHC. The following equations were used for global ERQ data with the outcomes of PCC and PHC separately:

$$\text{Level 1 (individuals): } y_{ij}(\text{PCC}_a \text{ or } \text{PHC}_a) = \beta_{0j} + \beta_{1j}(\text{ERQR}_a) + \beta_{2j}(\text{ERQS}_a) + \beta_{3j}(\text{ERQR}_p) + \beta_{4j}(\text{ERQS}_p) + r_{ij}$$

$$\text{Level 2 (couples): } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

The equations for the discussion-level (D) data were used with the outcomes of PCCD and PHCD separately:

$$\text{Level 1 (discussions): } y_{ijk}(\text{PCCD}_a \text{ or } \text{PHCD}_a) = \pi_{0jk} + \pi_{1jk}(\text{ERQSD}_a) + \pi_{2jk}(\text{ERQRD}_a) + \pi_{3jk}(\text{ERQSD}_p) + \pi_{4jk}(\text{ERQRD}_p) + e_{ijk}$$

$$\text{Level 2 (individuals): } \pi_{0jk} = \beta_{00k} + r_{0jk}$$

$$\pi_{1jk} = \beta_{10k}$$

$$\pi_{2jk} = \beta_{20k}$$

$$\pi_{3jk} = \beta_{30k}$$

$$\pi_{4jk} = \beta_{40k}$$

$$\text{Level 3 (couples): } \beta_{00k} = \gamma_{000} + u_{00k}$$

$$\beta_{10k} = \gamma_{100}$$

$$\beta_{20k} = \gamma_{200}$$

$$\beta_{30k} = \gamma_{300}$$

$$\beta_{40k} = \gamma_{400}$$

Results

Listwise deletion was used in analyses in the HLM program due to the low quantity of any Level 1 missing data (< 3%); thus, there were slight differences in the number of participants involved in each analysis. Basic correlations between the variables at the global level (see Table 1) and the discussion level (see Table 2) were conducted separately. Means and standard deviations of all variables are also available in Table 1 and Table 2.

Table 1

Descriptive Statistics and Correlations Among Global Variables

Individual Level	<i>M(SD)</i>	PCC	PHC	DERS	ERQSU	ERQRE	DERS _p	ERQSU _p
PCC _a	6.40(2.56)							
PHC _a	2.38(1.89)	-.11						
DERS _a	75.45(19.27)	-.08	.25**					
ERQSU _a	12.90(5.20)	.02	.29**	.27**				
ERQRE _a	29.15(6.19)	.13	-.03	-.36**	.08			
DERS _p	--	-.08	.32**	.24**	.12	-.02		
ERQSU _p	--	-.19*	-.05	.12	-.02	.01	.27**	
ERQRE _p	--	-.05	-.17 ^T	-.02	.01	.02	-.36**	.08

Note: Correlations are Pearson's *r* values calculated in SPSS. PCC_a = actor global perceived

constructive criticism; PHC_a = actor global perceived hostile criticism; DERS_a = actor global

difficulties in emotion regulation; ERQSU_a = actor global emotion regulation questionnaire

expressive suppression; ERQRE_a = actor global emotion regulation questionnaire cognitive

reappraisal; DERS_p = partner global difficulties in emotion regulation; ERQSU_p = partner global

emotion regulation questionnaire expressive suppression, ERQRE_p = partner global emotion

regulation questionnaire cognitive reappraisal.

^T*p* < .10. * *p* < .05. ** *p* < .01.

Table 2

Descriptive Statistics and Correlations Among Discussion Variables

Discussion Level	<i>M (SD)</i>	PCCD	PHCD	DERSD	ERQSUD	ERQRED	DERSD _p	ERQSUD _p
PCCD _a	4.90 (3.31)							
PHCD _a	1.46 (1.27)	.07						
DERSD _a	21.18 (5.69)	-.08	.32**					
ERQSUD _a	10.26 (5.06)	-.02	.20**	.39**				
ERQRED _a	23.23 (8.12)	.23**	.09 ^T	-.01	.33**			
DERSD _p		-.10 ^T	.14**	.10 ^T	.07	-.03		
ERQSUD _p		-.11*	.04	.07	-.08	-.09 ^T	.39**	
ERQRED _p		.06	-.04	-.03	-.09 ^T	.04	-.01	.33**

Note. Correlations are Pearson's *r* values calculated in SPSS. PCCD_a = actor discussion-level perceived constructive criticism; PHCD_a = actor discussion-level perceived hostile criticism; DERSD_a = actor discussion-level difficulties in emotion regulation; ERQSUD_a = actor discussion-level emotion regulation questionnaire expressive suppression; ERQRED_a = actor discussion-level emotion regulation questionnaire cognitive reappraisal; DERSD_p = partner discussion-level difficulties in emotion regulation; ERQSUD_p = partner discussion-level emotion regulation questionnaire expressive suppression; ERQRED_p = partner discussion-level emotion regulation questionnaire cognitive reappraisal.

^T*p* < .10. * *p* < .05. ** *p* < .01.

I first conducted analyses of the unconditional models of the outcomes to determine the proportion of variance in the outcomes between couples (the intraclass correlation coefficients), between individuals within couples, and between discussions within individuals within couples (see Table 3).

Table 3

Intraclass Correlations and Percentage of Variance Explained in Outcome Variables

	ICC	% Variance due to Differences Across Individuals	% Variance due to Differences Across Discussions
Individual Level			
PCC _a	.002	99.84	-
PHC _a	.301	69.89	-
Discussion Level			
PCCD _a	.000	29.42	70.57
PHCD _a	.208	16.01	63.15

Note. PCC_a = actor global perceived constructive criticism; PHC_a = actor global perceived hostile criticism; PCCD_a = actor discussion-level perceived constructive criticism; PHCD_a = actor discussion-level perceived hostile criticism.

Of particular note is that 99.84% of the variance in perceived constructive criticism was due to differences between individuals rather than couples, in comparison to 69.89% for perceived hostile criticism. The majority of variance in discussion level

variables lay between discussions, suggesting variation occurred even within individuals, not just between individuals.

I also examined the association of each global measure with its accompanying discussion-level measure using 3-level models, with global measures as Level 2 predictors of the Level 1 intercept for discussion-level measures. To estimate the size of each effect, the resulting t -value was converted to a correlation coefficient (r). Results are shown in Table 4.

Table 4

*Fixed Effects of Global Measures (Level 2) Predicting Discussion-Level Measures (Level 1) with
Converted Correlation Coefficients*

Measure	γ (SE)	df	t	r
DERS _a	0.16** (.02)	118	8.53	0.62
ERQSU _a	0.39** (.07)	118	5.92	0.48
ERQRE _a	0.31** (.11)	118	2.95	0.26
PCC _a	0.34** (.08)	118	4.25	0.36
PHC _a	0.26** (.06)	118	4.72	0.40

Note. DERS_a = actor global difficulties in emotion regulation; ERQSU_a = actor global emotion regulation questionnaire expressive suppression; ERQRE_a = actor global emotion regulation questionnaire cognitive reappraisal; PCC_a = actor global perceived constructive criticism; PHC_a = actor global perceived hostile criticism. Partner associations were not included in this table as they showed the exact same associations as the actor versions of the variables. Correlation coefficients were converted from t -scores obtained in HLM.

** $p < .01$.

All the global measures demonstrated significant positive associations with discussion-level measures. Global and discussion-level DERS showed the highest correlation, with most of the remaining coefficients showing moderate correlations, with the exception of reappraisal, which had a small to medium association. These patterns of association suggest that the global and discussion measures are related, but not isomorphic.

Predictions of Perceived Constructive Criticism

Global measures. Inconsistent with hypotheses, neither actor nor partner overall difficulties in global emotion regulation difficulty (DERS scores) significantly predicted global PCC (see Table 5). Analyses using ERQ subscales also yielded nonsignificant effects for actor and partner reappraisal and for actor suppression in predicting PCC (see Table 6). The only significant effect to emerge in the prediction of global PCC was a negative partner effect of expressive suppression (see Table 6), which was consistent with hypotheses.

Table 5

Fixed Level 1 Actor and Partner Effects of Difficulties in Emotion Regulation (DERS) in Predictions of Global Perceived Constructive Criticism

Parameter	γ (SE)
DERS _a	-0.009 (0.01)
DERS _p	-0.009 (0.01)

Note. DERS_a= actor global difficulties in emotion regulation; DERS_p= partner global difficulties in emotion regulation.

Table 6

Fixed Level 1 Actor and Partner Effects of ERQ Expressive Suppression (ERQS) and Cognitive Reappraisal (ERQR) in Predictions of Global Perceived Constructive Criticism

Parameter	γ (SE)
ERQR _a	0.05 (0.04)
ERQS _a	-0.00 (0.05)
ERQR _p	-0.02 (0.04)
ERQS _p	-0.09* (0.05)

Note. ERQRE_a= actor global emotion regulation questionnaire cognitive reappraisal; ERQSU_a= actor global emotion regulation questionnaire expressive suppression; ERQRE_p= partner global emotion regulation questionnaire cognitive reappraisal; ERQSU_p= partner global emotion regulation questionnaire expressive suppression.

* $p < .05$.

Discussion-level measures. Inconsistent with hypotheses, neither actor nor partner discussion-level DERS significantly predicted discussion-level PCC (see Table 7). Analyses using discussion-level ERQ scores revealed no actor effect of suppression, but did show a significant negative partner effect of suppression on discussion-level PCC, as hypothesized (see Table 8). There was also a significant positive actor effect of cognitive reappraisal on discussion-level PCC, as hypothesized, but no partner effect of discussion-level reappraisal.

In sum, overall difficulties in emotion regulation had no actor or partner effects on PCC at the global or discussion levels. However, significant, negative partner effects of suppression on PCC were found at both levels, as hypothesized. Reappraisal was also found to have an actor effect (but no partner effect) on PCC at the discussion level, in the expected direction.

Table 7

Fixed Level 1 Actor and Partner Effects of Discussion-Level Difficulties in Emotion Regulation (DERSD) in Predictions of Discussion-Level Perceived Constructive Criticism

Parameter	γ (SE)
DERSD _a	-0.05 (0.03)
DERSD _p	-0.06 ^T (0.03)

Note. DERSD_a = actor discussion-level difficulties in emotion regulation; DERSD_p = partner discussion-level difficulties in emotion regulation.

^T $p < .10$.

Table 8

Fixed Level 1 Actor and Partner Effects of Discussion-Level ERQ Expressive Suppression (ERQSD) and Cognitive Reappraisal (ERQRD) in Predictions of Discussion-Level Perceived Constructive Criticism

Parameter	γ (SE)
ERQRD _a	0.11** (0.02)
ERQSD _a	-0.06 (0.04)
ERQRD _p	0.03 (0.02)
ERQSD _p	-0.08* (0.04)

Note. ERQRD_a = actor discussion-level emotion regulation questionnaire cognitive reappraisal;

ERQSD_a = actor discussion-level emotion regulation questionnaire expressive suppression;

ERQRD_p = partner discussion-level emotion regulation questionnaire cognitive reappraisal;

ERQSD_p = partner discussion-level emotion regulation questionnaire expressive suppression.

* $p < .05$. ** $p < .01$.

Predictions of Perceived Hostile Criticism

Global measures. Consistent with hypotheses, both actor and partner effects of difficulties in emotion regulation (DERS) were significantly, positively associated with global PHC (see Table 9). Results using data from the ERQ, however, revealed that only actor expressive suppression was significantly positively associated with global PHC (as hypothesized). The partner effect of suppression and the actor and partner effects of reappraisal were nonsignificant (see Table 10).

Table 9

Fixed Level 1 Actor and Partner Effects of Difficulties in Emotion Regulation (DERS) in Predictions of Global Perceived Hostile Criticism

Parameter	γ (SE)
DERS _a	0.003* (0.001)
DERS _p	0.004** (0.001)

Note. DERS_a= actor global difficulties in emotion regulation; DERS_p= partner global difficulties in emotion regulation.

* $p < .05$. ** $p < .01$.

Table 10

Fixed Level 1 Actor and Partner Effects of ERQ Expressive Suppression (ERQS) and Cognitive Reappraisal (ERQR) in Predictions of Global Perceived Hostile Criticism

Parameter	γ (SE)
ERQR _a	-0.003 (0.004)
ERQS _a	0.016** (0.005)
ERQR _p	-0.007 (0.004)
ERQS _p	-0.001 (0.005)

Note. ERQRED_a = actor discussion-level emotion regulation questionnaire cognitive reappraisal; ERQSUD_a = actor discussion-level emotion regulation questionnaire expressive suppression; ERQRED_p = partner discussion-level emotion regulation questionnaire cognitive reappraisal; ERQSUD_p = partner discussion-level emotion regulation questionnaire expressive suppression.

* $p < .05$. ** $p < .01$.

Discussion-level measures. Consistent with hypotheses, discussion-level difficulties in emotion regulation (DERS) exerted a significant positive actor effect on discussion-level PHC (see Table 11). The partner effect of discussion-level DERS, however, was nonsignificant. Analyses of discussion-level ERQ scores revealed significantly positive actor and partner effects of suppression on discussion-level PHC (as

hypothesized), but actor and partner effects of reappraisal were unexpectedly nonsignificant (see Table 12).

Table 11

Fixed Level 1 Actor and Partner Effects of Discussion-Level Difficulties in Emotion Regulation (DERSD) in Predictions of Discussion-Level Perceived Hostile Criticism

Parameter	γ (SE)
DERSD _a	0.014** (0.002)
DERSD _p	0.003 (0.002)

Note. DERSD_a = actor discussion-level difficulties in emotion regulation; DERSD_p = partner discussion-level difficulties in emotion regulation.

** $p < .01$.

Table 12

Fixed Level 1 Actor and Partner Effects of Discussion-level ERQ Expressive Suppression (ERQSD) and Cognitive Reappraisal (ERQRD) in Predictions of Discussion-Level Perceived Hostile Criticism

Parameter	γ (SE)
ERQRD _a	0.001 (0.002)
ERQSD _a	0.010** (0.003)
ERQRD _p	-0.001 (0.002)
ERQSD _p	0.007* (0.003)

Note. ERQRED_a = actor discussion-level emotion regulation questionnaire cognitive reappraisal;

ERQSUD_a = actor discussion-level emotion regulation questionnaire expressive suppression;

ERQRED_p = partner discussion-level emotion regulation questionnaire cognitive reappraisal;

ERQSUD_p = partner discussion-level emotion regulation questionnaire expressive suppression.

* $p < .05$. ** $p < .01$.

In sum, overall difficulties in emotion regulation and greater use of expressive suppression exerted positive actor effects on PHC at both the global and discussion levels, as expected. Overall emotion regulation difficulties also exerted a significantly positive *partner* effect on global PHC, but this effect was not present at the discussion level. Conversely, though partners' suppression was not associated with global PHC, partners' suppression during discussions was associated with greater perceptions of

hostility in discussions. Finally, inconsistent with hypotheses, reappraisal did not play a role in the prediction of PHC at either the global or discussion levels.

Discussion

This study was designed to illuminate how the emotion regulation of each partner in a romantic couple influences both partners' interpersonal perceptions of hostile and constructive criticism from each other. I examined this issue both at the global level and in the context of specific discussions, using data from both partners. There were approximately equal numbers of significant actor and partner effects at both the global and discussion levels, which suggests that both actor and partner emotion regulation play a critical role in perceptions of criticism. Overall, the results of this study supported several, but not all, of the hypotheses.

Emotion regulation was associated with perceptions of communication in several ways. First, when people reported greater difficulty with emotion regulation overall, both they and their partners reported perceiving more hostile criticism overall. Second, people who endorsed greater use of suppression in general also reported greater perceptions of hostile criticism in general. In specific discussions, participants reported more hostile criticism from their partners when they reported greater difficulties in emotion regulation during discussion, and when both they and their partners reported using greater expressive suppression of emotion during the discussion. Finally, participants perceived less constructive criticism both globally and in discussions when their partners used more suppression. Interestingly, individuals' use of cognitive reappraisal had little association

with their perceptions of criticism, except that people who reported using more reappraisal during specific discussions perceived more constructive criticism from their partners.

The results suggest that individuals' maladaptive emotion regulation (as measured by overall difficulties and suppression) is a powerful predictor of their perceptions of hostile criticism across settings, so one might expect poor interpersonal perceptions whenever these kinds of emotion regulation are employed. These results are aligned with prior research that poor emotion regulation and expressive suppression are related to more negative construals of others' behavior and relationships (see review by Klein & Renshaw, 2015). Furthermore, since poor overall emotion regulation and suppression are associated with greater physiological arousal (e.g., Gross & Levenson, 1997, 2003; Gottman & Levenson, 1992; Kuo & Linehan, 2009) and more negative and less positive emotion (e.g., Bloch, Haase, & Levenson, 2014; Butler et al., 2003; Gross & John, 2003), the use of maladaptive emotion regulation may lead to heightened negative emotions and physiological arousal when criticism occurs, leading to a broader tendency to evaluate any criticism as hostile. Also, given that people tend to have cognitions relevant to the mood they are in (e.g., Siemer, 2005), if dysregulation and suppression lead to a negative emotional state, people may then be more likely to perceive partners' behavior in a negative manner. Finally, given that the partners of people who suppress tend to show greater expressions of hostility (Ben-Naim et al., 2013; Butler et al., 2007), these partners may actually be communicating more hostile criticism, which is then perceived accurately by the individuals who are having difficulty regulating.

This study also found *partner* effects of emotion regulation on individuals' perceptions of criticism in the expected directions, though their significance varied across the global and discussion measures. These partner effects may have occurred because people with poor overall emotion regulation and those who use suppression in particular during problem discussions may be more apt to communicate in a hostile manner when delivering criticism, which is then perceived by their partners. This idea is consistent with other findings that difficulties in emotion regulation are related to demonstrations of more aggression when provoked (Pond et al., 2012). Additionally, people using suppression show more hostile verbal behaviors (Ben-Naim et al., 2013) and also are perceived as more hostile (Butler et al., 2007). Furthermore, to the extent that difficulties in regulation and suppression are associated with a longer history of negative interactions, partners may be more likely to perceive criticism as hostile in general, as overarching positive or negative sentiment about the marriage can cloud perceptions of partners' behavior (e.g., Hawkins, Carrère, & Gottman, 2004; Notarius, Benson, Sloan, Vanzetti, & Hornyak, 1989; Robinson & Price, 1980; Vanzetti, Notarius, & NeeSmith, 1992). Overall, the findings that both individuals' and their partners' difficulties in emotion regulation predicted greater perceptions of hostile criticism globally, and that suppression showed the same associations in discussions, suggests that there may be a reciprocal relationship occurring, whereby two partners with difficulty regulating in general or who are suppressing in the moment may fall into the negative reciprocity of communication often seen in distressed couples (see review by Gottman & Levenson, 1986).

Interestingly, the most reliable predictor of perceived constructive criticism in this study was partners' use of suppression, both in general and in discussions. Other findings indicate that suppression is associated with less reported expression of positive and negative emotion (e.g., Gross & John, 2003), and people using suppression show a lack of responsiveness and are perceived as withdrawn (Butler et al., 2007). These restrictive effects of suppression may explain why partners' suppression showed more consistent effects in predicting less constructive criticism globally and in discussions. Perhaps the lack of emotional responsiveness associated with suppression led to lowered perceptions that any criticism delivered was constructive.

The single significant effect of reappraisal, whereby individuals using more cognitive reappraisal perceived more constructive criticism from their partners in discussions, aligns with prior research that found that positive attributions for criticism from influential close others predicted greater perceptions of constructive criticism (Allred & Chambless, 2014). It is possible that reappraisal directly influences people's attributional processes when interpreting criticism. Also, evidence suggests that reappraisal helps to reduce physiological arousal, anger, and other negative emotions in response to provocation (e.g., Mauss, Cook, Cheng, & Gross, 2007). Given that people tend to have cognitions relevant to the mood they are in (e.g., Siemer, 2005), people may be more likely to perceive partners' communication in a benign or helpful way to the extent that reappraisal reduces a negative mood state.

The lack of a general effect of individuals' reported use of cognitive reappraisal on their global perceptions of hostile or constructive criticism or discussion perceptions

of hostile criticism was surprising. However, this study's results are consistent with other findings that adaptive emotion regulation strategies are the most effective when implemented variably across contexts (e.g., Aldao & Nolen-Hoeksema, 2012). Thus, the *flexible* use of reappraisal as an emotion regulation strategy depending on the situation would likely lead to more benign interpretations of partners' communication at times when it is especially important to do so, such as during discussions of relationship and individual problems, but may not be as clearly effective if implemented routinely across situations. Also, reappraisal may be less relevant to perceptions of hostile criticism than maladaptive emotion regulation processes. Moreover, it could be a maladaptive or ineffective strategy in the face of actual hostility. This idea is supported by findings that reappraisal is associated with worse functioning in the face of perceived oppression (Perez & Soto, 2011) or uncontrollable stressors (Troy, Shallcross, & Mauss, 2013). However, to the extent that perceptions of hostile criticism are related to individuals' own poor emotion regulation, reappraisal may become a useful technique if used in place of suppression or other maladaptive strategies.

The results of the present study imply that prevention efforts and interventions for couples could potentially become more effective in producing more positive and less negative interpretations' of partners' communication by focusing on improvements of both partners in emotion regulation skill, including increasing awareness of the connection between these processes. More specifically, our results suggest that interventions for couples should focus on reducing individuals' use of expressive suppression and enhancing their facility with emotion regulation to decrease perceptions

of hostile criticism and increase perceptions of constructive criticism. Encouraging reappraisal in particular could be an important technique to encourage when couples are discussing problems, but there is less evidence from this study to suggest that enhancing reappraisal would have broad effects. Overall, these techniques could add an important point of intervention to evidence-based couple therapies, which often emphasize adjusting couples' communication on a behavioral level (e.g., see review by Snyder & Halford, 2012). Such behavioral changes have not always been found effective for relationship satisfaction over time (Baucom, Hahlweg, Atkins, Engl, & Thurmaier, 2006; Schilling, Baucom, Burnett, Allen, & Ragland, 2003). Perhaps addressing individual emotion regulation strategies of both partners could amplify the positive effects of such communication-focused interventions.

Variations of individual therapies aimed to enhance emotion regulation, such as Dialectical Behavior Therapy (DBT) or Acceptance and Commitment Therapy (ACT), have already been designed for couples in distress (Peterson, Eifert, Feingold, & Davidson, 2009), couples or families with a member with borderline personality disorder (e.g., Fruzzetti & Fruzzetti, 2003; Fruzzetti & Hoffman, 2004; Hoffman et al., 2005), and couples with chronic emotion dysregulation more broadly (Kirby & Baucom, 2007). These interventions show initial effectiveness in improving emotion regulation, relationship satisfaction, and related constructs (Hoffman et al., 2005; Kirby & Baucom, 2007; Peterson et al., 2009). Beyond reducing suppression and increasing reappraisal, mindfulness is another skill that may be helpful for couples. Mindfulness is associated with greater skill greater skill identifying and communicating emotions, controlling of

expressions of anger and aggression, empathizing, perspective taking, and greater marital satisfaction (Wachs & Cordova, 2007), as well as better communication behaviors when couples are in conflict (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007).

Mindfulness training is also associated with greater reappraisal and reductions in blaming others in college students (Huston, Garland, & Farb, 2011), greater positive reappraisal in individuals with pain (Garland, Gaylord, & Fredrickson, 2011), and with greater stress coping efficacy in nondistressed couples (Carson, Carson, Gil, & Baucom, 2004). Thus, mindfulness and other emotion regulation techniques may help partners perceive each other's actions and their relationship in a more positive light.

Although the present findings offer novel information regarding couple functioning, the current study has several limitations that must be considered when interpreting the results. The sample consisted of community couples, rather than a clinical sample of couples with marital distress or a particular psychiatric disorder; thus, it remains to be seen whether these findings extend to couples in a clinical setting. However, there is wide variability in difficulties in emotion regulation and use of suppression and reappraisal even in non-disordered college populations (Gatz & Roemer, 2004; Gross & John, 2003) and in our sample (see Table 1), suggesting that emotion regulation is relevant to couples in general. Also, all constructs were assessed via self-report, rather than objective observations of partners' behavior; thus, conclusions cannot be made about how emotion regulation affects actual communication between partners or the accuracy of partners' perceptions of each other.

Notwithstanding these limitations, this study is the first to connect couples' broad and specific emotion regulation to their broad and specific perceptions of hostile and constructive criticism. Findings suggest that emotion regulation may be a fruitful target of intervention to increase perceptions of constructive criticism and decrease perceptions of hostile criticism. Further research could build upon the results of this study by examining other potential relevant predictors of perceptions of constructive and hostile criticism and how emotion regulation might predict discrepancies between perceptions and objective observations of hostile and constructive criticism. Furthermore, examining the association of more specific emotion regulation strategies (e.g., acceptance, problem-solving, avoidance, thought suppression, rumination) that occur at multiple parts of the emotion generation process and multiple contexts (e.g., conflict discussions, support discussions, planning discussions) may help further clarify which techniques in which situations are most influential on perceptions of criticism.

Appendix

The Role of Emotion Regulation in Relationship Quality, Communication, and

Perceptions: A Review

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Abstract

Communication is an important predictor of romantic relationship quality. The research on how individual characteristics affect the generation and receipt of communication by partners in romantic relationships, however, is underdeveloped. This review clarifies and organizes the state of the literature on the role individual emotion regulation plays in romantic relationships, communication, and individuals' perceptions of their partners' communication. Studies were included if they measured emotion regulation and examined the outcomes of communication, perceptions of communication, or relationship quality. The majority of research in this area measures emotion regulation strategies of expressive suppression and cognitive reappraisal, with some other methods of measurement distinguishing between adaptive and maladaptive emotion regulation. Typically, for both partners, maladaptive emotion regulation (including suppression) was related to poor relationship outcomes, communication, and perceptions of communication, whereas adaptive emotion regulation (including reappraisal) was related to positive outcomes, communication, and perceptions of communication. Some exceptions to these patterns were found for particular emotions and contexts. Though the association of emotion regulation with relationship quality was well documented, the association of emotion regulation with relationship perceptions was minimally studied. Recommendations are made for further research.

The Role of Emotion Regulation in Relationship Quality, Communication, and Perceptions: A Review

A large body of research has demonstrated that communication is important to romantic relationship quality. For instance, Gottman (1993, 1994) identified four communication processes – criticism, contempt, defensiveness, and stonewalling – that predict marital dissolution. Negative emotion expression and reciprocity of these negative expressions is associated with less marital satisfaction (e.g., review by Gottman & Levenson, 1986). Also, being able to de-escalate negative emotion and express positive emotions during marital conflict predicts greater stability of marriage over time (Gottman, Coan, Carrère, & Swanson, 1998), and using positive emotion expressions such as affection and humor during conflict is related to greater marital satisfaction (Carstensen, Gottman, & Levenson, 1995; Johansen & Cano, 2007). Finally, a frequent focus of couples' therapies is the reduction of negative communication (review by Snyder & Halford, 2012). Given that existing evidence-based couples' therapies do not produce improvement in 25-30% of couples (review by Snyder & Halford, 2012), however, a broader range of strategies and focus may be needed.

How couples generate or receive communication may be one such focus, but most research on communication does not attend to individual characteristics that influence these variables. Moreover, research that examines couples' communication typically focuses on the delivery of communication only, without attending to how the *receivers* of communication perceive communication directed toward them. It is not readily apparent in the literature whether aspects of the communication delivery (e.g., particular wording

of statements), characteristics of the person giving or receiving communication (e.g., personality characteristics, emotion regulation), or characteristics of the relationship (e.g., commitment, satisfaction level) are what influence people to perceive their partners' communication as indicative of kindly or hostile intent.

The construct of emotion regulation, which is how people unconsciously or consciously manage their emotions, is likely important to how individuals formulate and perceive communication. It is often in social contexts that people try to regulate their emotions (e.g., see review by Gross, Richards, & John, 2006). So, how well people are able to regulate their emotions likely affects communication quality and perceptions of communication in all types of relationships (e.g., friendships, romantic relationships, parent-child relationships). To the extent emotion regulation influences communication and perceptual processes, couples therapies that incorporate or emphasize emotion regulation techniques may have more success in reducing negative escalation in couples and improving relationship satisfaction and stability.

The goal of this review is to clarify and organize the state of the literature on the role emotion regulation plays in romantic partners' communication, and their perceptions of their partners' communication. Relevant literature on these constructs in other types of relationships will also be reviewed, to better inform a broad understanding of the area. Prior to reviewing this literature, I will first briefly review the literatures on conceptualizing emotion regulation and the basic functions of emotions, to provide a context for the focused review of emotion regulation and romantic relationships.

Conceptualizations of Emotion Regulation

Emotion regulation has been defined in a variety of ways. Some authors define it more generally. For example, Thompson (1994) defines it as “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one’s goals” (pp. 27-28). Koole (2009) defines emotion regulation as “the set of processes whereby people seek to redirect the spontaneous flow of their emotion” (p. 6). Other authors are more specific in their conceptualizations. For example, Fruzzetti and Iverson (2006) conceptualized emotion *dysregulation* as involving three components: (1) vulnerability to negative emotion, (2) a lack of skills relevant to identifying emotions accurately, tolerating emotions, expressing emotions, and managing situations and arousal in ways that are effective and help one towards long-term goals and values, and (3) unhelpful reactions of others to the person’s expressions of emotionally relevant material (e.g., emotions, desires, thoughts, and goals). Similarly, Gratz and Roemer (2004) combined a variety of theories on parts of emotion regulation to suggest that good emotion regulation involves awareness, comprehension, and acceptance of emotions; impulse control and goal-directed behavior even when experiencing negative emotions; and the ability to use emotion regulation techniques to adjust emotional reactions flexibly, depending on the demands of the context and one’s desired goals.

One of these more specific models of emotion regulation that is predominant in interpersonally focused research is Gross’s (1998a, 1998b, 2001) process model of emotion regulation. Gross’s (1998a, 1998b, 2001) model focuses on the timing of emotion regulation strategies, suggesting that once an emotion is generated, it can be

adjusted at various points in time with various strategies. Gross (1998a, 1998b, 2001) highlights two primary sets of emotion regulation strategies: those that are *antecedent-focused*, when attempts to regulate the emotion begins before responses to emotional cues are completely activated, and those that are *response-focused*, when regulation strategies occur after these responses have begun. In the context of interpersonal relationships, many researchers have focused on two particular examples of these strategies: cognitive reappraisal and expressive suppression. *Cognitive reappraisal* is an antecedent-focused strategy that involves changing one's interpretation of the event to change the emotional response. *Expressive suppression* is a response-focused strategy that involves inhibiting the verbal and nonverbal expression of emotions (Gross, 1998a, 1998b).

Much empirical research has supported Gross's (1998a, 1998b, 2001) model, and it is frequently used in interpersonal research. Thus, many studies in this review focus on expressive suppression and reappraisal as emotion regulation in association with communication and relationships. However, it is not the only model of emotion regulation, so broader studies of emotion regulation and communication are warranted. Several other studies reviewed below use their own measures of emotion regulation, which are not always part of widely used models. Those measures will be discussed in the context of those studies, with extrapolation to other studies and constructs where possible. Within the context of the multiple definitions of emotion regulation, this review will attempt to demonstrate the importance and utility of emotion regulation in furthering our understanding of communication and functioning in relationships.

Cognitive, Behavioral, and Physiological Correlates of Emotion and Emotion Regulation

Several theories and studies suggest that emotions differ in both their valence, such as positive and negative, and in their degree of arousal, from low to high (Feldman-Barrett & Russell, 1998; Larsen & Diener, 1992; Russell, 1980; Watson & Tellegen, 1985). Moreover, although recent evidence suggests that no one emotion has a completely unique pattern of autonomic nervous system activation (see review by Norman, Berntson, & Cacioppo, 2014), a recent meta-analysis suggests that there are consistent and distinct neural patterns of brain activity associated with specific emotions that are more distinct than the physiological arousal patterns (Vytal & Hamann, 2010). The presence of physiological and neurological differences between emotions suggests that each emotion creates an atmosphere in the brain and body that could lead to different cognitions and behaviors. Indeed, empirical evidence confirms that emotions that differ in valence and arousal have differential effects on physiological, cognitive, and behavioral outcomes (see, for example, review by Kreibig, 2010; meta-analysis by Lench, Flores, & Bench, 2011).

In line with this notion, emotions influence cognitive processes in multiple ways. For instance, negative emotions are related to a narrowing of attention toward relevant (i.e., threatening) stimuli (reviews by Fredrickson, 1998; Mathews & MacLeod, 1994; Mogg & Bradley, 1998), whereas positive emotions are associated with a broader attentional focus (e.g., Wadlinger & Isaacowitz, 2006; review by Fredrickson, 1998). Also, anger has demonstrated associations with cognitions of others' responsibility (e.g.,

Keltner, Ellsworth, & Edwards, 1993), punishing judgments (e.g., Lerner, Goldberg, & Tetlock, 1998), and the desire for revenge (e.g., DiGiuseppe & Froh, 2002).

Alternatively, sadness has been connected to negative judgments of oneself and a greater tendency to attribute negative events to oneself than to others (review by Wisco, 2009).

Finally, anxiety has been linked to cognitions about failure (e.g., Smith & Mumma, 2008) and higher estimates of risk (Lerner & Keltner, 2000, 2001). There is also evidence that different emotions are linked with different types of behavioral tendencies. For instance, anger has been linked with aggression (e.g., Cox & Harrison, 2008), whereas anxiety has been linked with avoidance (e.g., Craske et al., 2009), though these behaviors do not occur uniformly in every situation in which these emotions are present.

Based on these findings, it is quite likely that people's emotions affect their own communication behaviors and their perceptions of others' communication with them. Consequently, how people regulate their emotions will likely influence these processes, as well. It is important to note, however, that the effects of various emotions (and, consequently, the regulation of those emotions) likely differ in different contexts, particularly an interpersonal context as compared to an intrapersonal (i.e., individual) context. In an intrapersonal context, it has been suggested that, although both reappraisal and suppression reduce the intensity of negative emotions, reappraisal may be a superior strategy, because expressive suppression can overly tax cognitive self-regulatory resources (e.g., Richards & Gross, 1999; Richards 2004). In an interpersonal context, however, it is conceivable that, at times, suppression of some emotions might enhance some relationship outcomes. Specifically, theory and research on romantic couples have

led to distinctions between *hard emotions* like anger and irritation, which relate to power and control, and *soft emotions* like sadness or disappointment, which are more associated with vulnerability (Dimidjian, Martell, & Christensen, 2002; Jacobson & Christensen, 1996). In romantic couples, hard negative emotions are associated with more negative and fewer positive forms of communication, whereas soft negative emotions are associated with less negative and somewhat more positive communication, as well as better conflict resolution (Sanford, 2007). Thus, suppression of the expression of hard emotions like anger might lead to better relationship outcomes in some instances, even if resulting in the temporary individual distress (e.g., increased sympathetic nervous system activity) that is often associated with suppression (e.g., Gross & Levenson, 1993, 1997). It is less clear how different regulation of hard vs. soft emotions might differentially impact *perceptions* of others' communication, as such perceptions are intraindividual experiences of interpersonal events. Thus, these effects may be more in line with the individual effects of emotion regulation, suggesting that suppression could be negative, regardless of the emotion being regulated.

In sum, regulation of emotions is likely to have effects on communication behaviors and perceptions of communication. Moreover, the effects of regulation may depend, in part, on the particular emotion being regulated, the arousing nature of that emotion, and the context in which that emotion is being regulated. Based on these ideas, this review explores the impact of emotion regulation skills and techniques on relationship quality, relational communication, and perceptions of relational communication to help elucidate the role of emotion regulation in an interpersonal

context, which can ultimately better inform therapeutic techniques for the treatment and prevention of couples' distress.

Method

Searches for literature relevant to this review were conducted using PsycInfo. Keywords used for emotion regulation included "emotion regulation," "affect regulation," "dysregulation," "suppression," "reappraisal," "experiential avoidance," and "acceptance." Keywords for relationship quality included "relationship quality," "marriage," "marital," "couples," "couples therapy," "marital therapy," "romantic," "distress," "satisfaction," "support," and "relatedness." Keywords for communication included "communication," "interaction," "criticism," "constructive," "nonhostile," "non-hostile," "hostile," and "expressed emotion." Keywords for perceptions (of communication) included "perception," "perceived," "attribution," "interpretation," "bias," "cognition," "construal," and "judgment." Article abstracts were reviewed to determine relevance, and if an article seemed potentially relevant, the methods sections were reviewed to check that the appropriate constructs were measured. Articles were ultimately included in this review if they directly measured intrapersonal emotion regulation and its association with social or relationship outcomes, communication outcomes, or social perception outcomes. Several articles included in this review included results relevant to more than one section (relationship quality, communication, or perceptions). Thus, these articles are repeated in the review, with results for each section reviewed separately.

Emotion Regulation and Relationship Quality

Expressive Suppression

Self-report studies generally show negative associations of global use of expressive suppression and social variables. Gross and John (2003) found that greater self-reported expressive suppression (relative to effects of reappraisal) was related to more self-reported avoidance of attachment in close relationships and less self-reported social support in 692 college students. Moreover, in a subset of 80 participants, self-reported suppression was negatively related to three peers' ratings of the participants' closeness with others, although it was unrelated to peers' ratings of their own liking of the participants. In a clinical sample of 162 women who had self-injured, Turner, Chapman, and Layden (2012) similarly discovered that self-reported expressive suppression of emotions was positively related to self-reported use of problematic interpersonal styles, although unrelated to self-reported social problem solving (e.g., trouble identifying social problems, coming up with and implementing solutions).

In a more complex, longitudinal study, Srivastava, Tamir, McGonigal, John, and Gross (2009) measured self-reported suppression in 278 young adults during the summer before college and again upon beginning college. Students also reported on social outcomes at baseline during the summer, in weekly reports over the course of their first semester, and at the end of their first semester. Finally, peers also reported on students' social outcomes at the end of the semester. The authors found that suppression measured in different ways (variance shared between summer and on-campus assessments and variance unique to the on-campus assessment) predicted less perceived support from parents and friends, less closeness to others, and less satisfaction with their social lives

(in both weekly and end-of-semester reports). In addition, both suppression measures were negatively associated with peers' end-of-semester reports of participants' social satisfaction, although again unrelated to peer-reported likeability.

Extending these patterns to romantic relationships, Feeney (1999) studied self-reported control of negative and positive emotions in 238 married couples. The construct of control was similar to suppression, as it was measured as "bottling" up or not expressing particular positive emotions of happiness, love, and pride, or negative emotions of anger, sadness, and anxiety. Feeney (1999) found that control of positive emotions was negatively related to participants' own marital satisfaction, and control of negative emotions was negatively related to participants' spouses' marital satisfaction. Husbands' control of negative emotions also was negatively related to their own marital satisfaction.

In a mixed-method study, Impett and colleagues (Impett et al., 2012; Impett, Le, Kogan, Oveis, & Keltner, 2014) videotaped 80 adult couples discussing a time when they had sacrificed for their partner, after which they completed measures of expressive suppression, emotions, authenticity (i.e., being "true" to oneself), and relationship quality, as well as perceptions of partners' sacrifice, suppression, emotions, and authenticity. In a subsequent 2-week daily experience study, participants then indicated whether they or their partner sacrificed to each other and completed similar questionnaires. Impett et al. (2012) reported that, in the daily study, on days when people reported more suppression of their emotions, they *and* their partners reported lower levels of relationship satisfaction and more conflict. This effect was partially mediated by self-

reported authenticity, suggesting that people using suppression and their partners both experience poorer relationship quality when the person using suppression does not feel that they are being “true” to themselves in those moments of sacrifice. Similarly, Impett et al. (2014) found that, on days individuals perceived their *partner* to be using suppression during sacrifice, they reported lower relationship quality, more conflict, more experience of negative emotions, and less experience of positive emotions. Moreover, individuals’ greater use of suppression (Impett et al., 2012) and perceptions of partners’ greater use of suppression (Impett et al., 2014) during sacrifice from the daily study were associated with ratings of worse relationship satisfaction 3 months later. Finally, Impett et al. (2014) also reported that people who perceived their partners as suppressing emotions more during the laboratory discussions of their partners’ sacrifice reported feeling more negative and less positive emotion after the discussions. Individuals’ perceptions of their partners’ authenticity mediated the laboratory and daily associations, but not the longitudinal associations, of individuals’ perceptions of their partners’ suppression with their own relationship quality and emotions. This suggests that partners perceive suppression in the moment as inauthentic, which can explain its deleterious relational effects. Overall, these results of studies of romantic relationships suggest that suppression has negative effects on romantic relationship quality, regardless of whether emotions are positive or negative in valence, and may be explained by feelings or perceptions of inauthenticity.

A number of experimental studies have also demonstrated that expressive suppression is detrimental to interpersonal outcomes. Butler and colleagues (2003)

assessed emotion regulation techniques and personal and social consequences in unacquainted dyads of undergraduate students discussing an upsetting film in a series of two studies, which was then replicated by Butler, Lee, and Gross (2007). In Study 1 of Butler et al. (2003), 72 women were split into three groups of dyads, one in which one partner was explicitly instructed to use expressive suppression, a second in which one partner was instructed to cognitively reappraise emotions, and a third that received no instructions on how to modify emotions. In Study 2 of Butler et al. (2003) and in Butler et al. (2007), 84 and 120 undergraduate women, respectively, were compared in only two groups: dyads where one partner was given instructions to suppress emotion and dyads who received no instructions. Participants instructed to suppress reported more distraction than the other groups (Butler et al., 2003, Studies 1 and 2). In Study 2, but not Study 1 of Butler et al. (2003), suppressors experienced higher blood pressure and reported fewer positive and more negative emotions about their partner (which were only measured as more general emotions in Study 1). The *partners* of participants instructed to use suppression also demonstrated increased blood pressure in comparison to other groups (in both Studies 1 and 2; Butler et al., 2003), suggesting that talking with someone who was using suppression resulted in increased stress. In comparison to other groups, the partners of those who were instructed to suppress emotions also reported that they felt less rapport with their suppressing partners (Butler et al., 2003, Study 2 only), liked suppressors less and felt less inclined to form a friendship with them (Butler et al., 2003, Study 2 [although not measured in Study 1]; Butler et al., 2007), and saw suppressors as more withdrawn and hostile (Butler et al., 2007; not measured in Butler et al., 2003).

A similar experimental study demonstrated that these negative interpersonal effects of suppression hold in dating couples (Richards, Butler & Gross, 2003). Eighty-six romantic couples (dating at least 6 months) engaged in discussions of a relationship conflict, with three groups: (1) one partner was instructed to suppress emotions, (2) one partner was instructed to reappraise emotions, and (3) no instructions were given to either partner. Once again, suppression demonstrated negative effects, with participants who were instructed to suppress expression of emotion showing less memory of conversational information, relative to the other groups. Suppressors also felt less positive emotion and more negative emotion than reappraisers (but did not differ from controls) immediately after instructions were given (before the discussion of conflict), but not after the discussion.

In spite of the evidence for negative effects of suppression, a small amount of research suggests suppression may not always be detrimental to relationships, depending on the context. Individuals' habitual suppression of anger specifically may have beneficial effects for long-standing relationships. Feeney, Noller, and Roberts (1998) studied self-reported control (defined as suppression and "bottling up") of the negative emotions of anger, sadness, and anxiety in 72 romantic couples with relationships of 12 months or longer. Although control of sadness was negatively related to partners' relationship satisfaction, control of anger was positively related to partners' relationship satisfaction. Feeney et al.'s (1998) findings with regard to anger are in line with theory and research suggesting that the expression of hard emotions in romantic couples is associated with poorer relationship satisfaction (e.g., Sanford & Rowatt, 2004). Despite

the potential negative effects of expressive suppression on the individual, this emotion regulation strategy may still be beneficial for the partner and the couple as a whole, when the emotion being suppressed is anger directed at the partner. This pattern may be even stronger the “harder” the anger is, since observational research shows that the expression of anger with hostility, such as showing contempt, belligerence and defensiveness, is associated with marital dissolution, but anger in the absence of contempt and belligerence (i.e., low-intensity expressions of frustration) is not (Gottman et al., 1998). However, more studies are needed to replicate beneficial effects of suppression of anger on relationship outcomes.

Studies that examine these constructs in different situational contexts also show exceptions for the negative relational effects of suppression. In a 14-day daily experience study of 73 undergraduates in dating relationships, Le and Impett (2013) examined personal and social consequences of emotion regulation during days students reported making sacrifices for their partner. They found that students who placed greater value on harmony in relationships experienced greater daily well-being and relationship quality when they suppressed their emotion expression in relation to making sacrifices for their partners. In contrast, those who placed lower value on relationship harmony experienced lower well-being and (marginally) lower relationship quality when they suppressed the expression of their emotions in the context of sacrifice for their partners. The authors discovered these effects were mediated by feelings of authenticity (i.e., by how much participants reported feeling that they were “true” to themselves) at these times. Similarly, in Butler et al.’s (2007) study of interactions of female dyads in which one

member was instructed to suppress or given no instructions, women with higher European values were seen as more hostile and withdrawn when they suppressed in comparison to women with more bicultural values (including Asian values like interdependence). Thus, participants' values about personal relationships, which may be influenced by culture, appear influential to the level of detriment caused by suppression.

Taken together, both self-report and experimental studies of expressive suppression or control of positive and negative emotions generally indicate that suppression is associated with negative social outcomes, such as less closeness, support, and satisfaction, for both new and long-term relationships. Furthermore, interacting with someone using suppression appears to be unpleasant, decreasing likeability and increasing stress. These findings are consistent with Gross's (1998a, 1998b, 2001) model, which suggests that response-focused emotion regulation strategies, which occur after responses to emotional cues are completely activated, are generally less effective. The general findings of suppression's negative effect for relationships are also consistent with research that shows that expression of emotions enhances intimacy (e.g., Laurenceau, Barrett, & Pietromonaco, 1998), so suppression of this expression likely decreases intimacy and understanding by reducing the expression of emotion and impairing communication behavior (as reviewed below in the communication section). Furthermore, suppression's association with distraction and difficulties with conversational memory in comparison to reappraisal is consistent with other non-relationship oriented studies of suppression and memory for emotional information (e.g., Egloff, Schmukle, Burns, & Schwerdtfeger, 2006; Richards & Gross, 2000) and

executive functioning (Franchow & Suchy, 2015), which suggests that suppression in particular depletes cognitive resources which may leave a suppressor less available to engage with a partner in a closeness-building manner or may reduce their understanding of a partner's point of view due to forgetting.

There were some contrary findings where habitual suppression was unrelated to peer-reported likeability by well-known acquaintances (Gross & John, 2003; Srivastava et al., 2009), related to neutral or better partner ratings of relationship quality when applied to anger (Feeney et al., 1998), or related to better well-being in times of sacrifice for people with greater value of relationship harmony (Le & Impett, 2013). These findings suggest that suppression in general is detrimental to individual well-being as well as relationships, but may be beneficial at times for the relationship if applied to “hard” high-intensity emotions or in a manner consistent with the values of the person who is suppressing. However, further research on the expressive suppression of different negative emotions in different conversational and relationship contexts is needed. Also, further research specific to the effect of suppression on the quality of long-term romantic relationships would be helpful to replicate and support the results found in a few studies here.

Cognitive Reappraisal

In contrast to expressive suppression, cognitive reappraisal is generally associated with positive social and relationship outcomes. In Gross and John's (2003) study, for the subset of 80 college students (out of 692) who each had three peer reports available, higher levels of self-reported cognitive reappraisal (when controlling levels of self-

reported suppression) were positively related to peer ratings of participants' closeness with others and liking of participants. However, cognitive reappraisal was unrelated to self-reported avoidance of attachment and social support in the broader sample of students. In a separate study of 222 community adults, self-reported use of cognitive reappraisal was associated with perceived availability of social support in general (Hopp, Troy, & Mauss, 2011).

Self-reported use of reappraisal has also generally been found to be associated with better interpersonal outcomes in the context of mental health problems. In their study of 162 women who had engaged in self-injurious behavior, Turner and colleagues (2012) found a positive association between reappraisal and social problem solving and no association of reappraisal with problematic interpersonal styles (Turner et al., 2012). Henry, Rendall, Green, McDonald, and O'Donnell (2008) found that self-reported use of cognitive reappraisal was positively related to multiple domains of self-reported social functioning in 38 nondisordered control participants and 41 participants with schizophrenia. Similarly, in a daily diary study of college students, Farmer and Kashdan (2012) found that use of cognitive reappraisal to reduce negative emotions was related to fewer negative social events (e.g., being excluded by friends) the following day, but only for those with low social anxiety. For those with higher social anxiety, cognitive reappraisal was unrelated to the next day's social events. The authors speculated that this pattern might have been the result of ineffective use of the strategy or a difficulty counteracting the general tendency toward negative thinking in social anxiety. Overall, self-report studies suggest that the use of cognitive reappraisal to regulate emotions is

associated with better social outcomes, with the exception of one nonsignificant finding in the context of social anxiety.

Experimental and observational studies of reappraisal also suggest that it is generally beneficial to the experience of a social interaction and relationship satisfaction. In Butler et al.'s (2003) study of unacquainted partners discussing an upsetting film, those participants who were instructed to use reappraisal reported feeling less distracted in the conversation than those who were instructed to use suppression. Also, the partners of participants instructed to reappraise their emotions showed less increase in blood pressure than the partners of participants who were instructed to suppress emotional expression. Of note, however, there were no differences in partners' ratings of rapport based on whether participants were instructed to reappraise. Similarly, Richards et al. (2003) found that members of dating couples who were instructed to reappraise during discussions remembered more of what happened in the conversation than members who were instructed to suppress emotional expression. Further demonstrating the power of reappraisal, Finkel, Slotter, Luchies, Walton, and Gross (2013) conducted a longitudinal study of 120 heterosexual married couples, in which some couples were randomly assigned to a 7-minute reappraisal intervention at 12, 16, and 20 months. Couples were asked to write about the most significant recent conflict with their partner from a neutral 3rd party perspective and how they might be successful in taking this perspective during disagreements over the next 4 months. Those who received the intervention had a lessening of the downward slope in marital quality that all couples had been experiencing in the first year of the study, whereas control couples continued to see a decline in marital

quality. Interestingly, this effect was partly mediated by a reduction in conflict-related distress. The results of this study offer experimental evidence that use of reappraisal can lead to beneficial outcomes for romantic couples, perhaps through reducing the negative impact of conflicts.

Overall, self-report studies of reappraisal generally show it is beneficial to social outcomes, such as likeability, closeness, and general social functioning. Experimental studies also suggest that cognitive reappraisal enhances cognitive and physical processes, such as greater memory and lower blood pressure, as well as relationship quality. Given that habitual reappraisal is connected with greater experience of positive emotion (Gross & John, 2003), reappraisal may enhance relationship quality partly via the expansive thinking associated with positive emotions (e.g., review by Fredrickson, 1998). However, further research is needed regarding reappraisal's impact on the quality of close, long-term relationships and whether it is differentially effective for different emotions and relational contexts. The extensive evidence supporting cognitive behavioral therapy for anxiety (e.g., Otte, 2011), depression (e.g., Butler, Chapman, Forman, & Beck, 2006; Driessen & Hollon, 2010), and anger problems (e.g., Beck & Fernandez, 1998) suggests that reappraisal, which is a major component of cognitive restructuring, may be helpful personally and relationally for extreme versions of fear, sadness, and anger. However, reappraisal would likely be ineffective or dangerous in changing emotions related to unacceptable partner behavior, like physical violence, or when problems can be solved instead of re-evaluated. In fact, greater tendencies to express forgiveness (which presumably might be related to reappraisal of the actions being forgiven) have been

associated with continued psychological and physical aggression in new marriages (McNulty, 2011). Also, more reappraisal is associated with more depression in the face of controllable stressors (Troy, Shallcross, & Mauss, 2013) and worse psychological functioning in the face of perceived oppression (Perez & Soto, 2011). Thus, further work is needed to illuminate the contextual factors that may moderate the effects of reappraisal on relationship outcomes.

Other Measures of Emotion Regulation

Most other studies of emotion regulation and social outcomes utilize measures of emotion regulation that typically differentiate broadly between adaptive or maladaptive forms of emotion regulation. For instance, Phillips and Power (2007) suggested that functional emotion regulation involves processing emotional information in a helpful way, such as putting the situation into perspective, whereas dysfunctional emotion regulation involves unhelpful processing of emotional information, such as rejecting or blocking emotions or taking feelings out on others. In a study of 225 adolescents, they found that greater self-reported dysfunctional emotion regulation was related to less parent-reported prosocial behavior, more peer and conduct problems, and less self-reported social support. Alternately, greater functional emotion regulation was related to more parent-reported prosocial behavior and more self-reported social support. Turner and colleagues (2012) utilized the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004), which assesses awareness, understanding, and acceptance of emotions, the ability to engage in goal directed behavior and avoid impulsive behavior when feeling negative emotions, and access to effective emotion regulation strategies, in their study of

women who had engaged in nonsuicidal self-injury. Greater overall difficulty in emotion regulation was associated with greater general tendencies to use problematic interpersonal styles and less adaptive social problem solving. In a study of 92 married couples, Cordova, Gee, & Warren (2005) showed that self-reported difficulty identifying emotions was negatively related to individuals' and partners' marital adjustment, and individuals' feelings of safety in an intimate relationship. Husbands' difficulties identifying emotions were also related to wives' feelings of intimate safety.

In an observational study of 52 married couples, Carrère, Mittmann, Woodin, Tabares, & Yoshimoto (2005) coded interviews for how well couples regulated the intensity and frequency of anger, how much anger was a problem in different areas of their life, and whether they had techniques to help them with anger (e.g., self soothing). Separate analyses of husbands' and wives' data both showed that participants' overall anger dysregulation was negatively related to their self-reported marital satisfaction. In another observational study, Gottman and Levenson (1992) defined regulated couples as those who showed greater ratios of positive to negative affect communication codes across the course of marital interaction tasks, and nonregulated couples as those which showed a negative balance of these codes. In comparison to regulated couples, non-regulated couples rated their marital problems as more severe at baseline, had lower marital satisfaction at baseline and 4-year follow up assessments, and showed a greater risk of later marital dissolution. Similarly, in three assessments over the course of 13 years, Bloch, Haase, and Levenson (2014) examined how quickly middle-aged and older-couples showed decreases in negative emotion, behavior, or physiology (called

downregulation) after notable elevations in at least 2 out of 3 of those constructs for 5 seconds during conflictual discussions in the laboratory (called “negative emotion events”). At baseline, wives who had quicker downregulation endorsed greater marital satisfaction, as did their husbands. Moreover, quicker downregulation in both wives and husbands predicted greater marital satisfaction in wives over time.

In sum, these studies using other methods of measuring emotion regulation suggest that dysfunctional emotion regulation predicts poorer social behaviors and outcomes, whereas more adaptive and functional emotion regulation predicts better social behaviors and outcomes. Of note, however, affective behavior codes themselves were sometimes used as measures of emotion regulation, which may confound how couples deal with emotions internally with how they outwardly express them. Though both are theoretically and empirically related to marital satisfaction, they may function differently. Further research is needed to understand how broad skills in emotion regulation might impact particular social contexts or particular emotions, since measurement of the use of measures of broad skills might obscure contextual results such as those found above with suppression and reappraisal.

Emotion Regulation and Communication

Given that communication is a key element to functioning in relationships (e.g., Carstensen et al., 1995; Gottman et al., 1998; Gottman & Levenson, 1986), communication may be one mechanism by which emotion regulation impacts relationship quality. As noted above, emotions of different valence and intensity influence neurophysiology, cognition, and behavior (Kreibig, 2010; Lench et al., 2011; Vytal &

Hamann, 2010). To the extent that the regulation of emotions changes the valence and arousal level of emotions, this neurophysiological and cognitive environment of the mind and body should also change. Therefore, people's emotion regulation skills or strategies are likely to impact their communication and perceptions of others' communication via these neurophysiological and cognitive changes. Indeed, this is likely such an important link that, as noted above, some authors have gone so far as to operationalize poor emotion regulation explicitly in terms of communication (e.g., Gottman & Levenson, 1992).

This section of the review addresses empirical studies linking intrapersonal emotion regulation and interpersonal communication. We first discuss studies of suppression and reappraisal in particular and then review studies of broader emotion regulation skills or other strategies.

Suppression, Reappraisal, and Communication

Several studies have evaluated the association of different forms of emotion regulation with the expression of emotion. Gross and John (2003) found that greater self-reported use of cognitive reappraisal strategies in 49 college students (who were rated by 147 peers) were associated not only with self-reported experience of more positive and less negative emotions, but also with both self- and peer-reported *expression* of more positive and less negative emotions in typical interactions with others. In contrast, greater self-reported use of expressive suppression predicted self-reported experience of less positive and more negative emotion, as well as self- and peer-reported *expression* of less positive emotion. (Self-reported suppression was unrelated to self- and peer-reported

expression of negative emotions.) As might be expected, greater self-reported expressive suppression of emotion also predicted expressing less negative emotion than was experienced. Finally, there was a moderately positive correlation between self- and peer-ratings of the extent of suppression, indicating that peers could often tell when participants were using suppression, whereas the positive correlation between self- and peer-ratings of reappraisal was low and only trended toward significance. Overall, these results suggest that, compared to reappraisal, suppression is related to emotional communication that is less authentic, less positive, and less disclosing.

Several experimental studies have demonstrated that suppressing the expression of emotions produces some unique problems with communication in social interactions. In Butler et al.'s (2003) study of unacquainted dyads who discussed an upsetting film, participants instructed to suppress emotions showed less expression of both negative and positive emotion, as well as less responsiveness (i.e., a lack of responses or tangential responses) to their partner, as compared to controls. Furthermore, this lower responsiveness of suppressors mediated the association of suppression with lower feelings of rapport in the partner. These findings suggest that suppression interferes with someone's ability to connect to others by making them less responsive in contexts where a reaction and emotion expression might be warranted (e.g., discussing an upsetting film).

In their study of unacquainted female dyads, Butler et al. (2007) replicated the finding that participants instructed to suppress were less responsive to their interaction partners than those in the control group. Using objective coding of interactions, they also discovered that suppressors showed fewer affiliative behaviors than controls. Moreover,

the partners of suppressors showed more objectively coded hostile behaviors (e.g., nonverbal looks of disgust or annoyance) and fewer affiliative behaviors (e.g., smiles and laughter) than the partners of controls. These results suggest that suppression elicits poorer communication in both suppressors and their conversation partners. Given the observed changes in suppressors' behavior, it is possible that partners of suppressors have negative perceptions of the suppressors' lack of emotional communication, which in turn impacts their overall rapport with and behavior toward suppressors. Of note, they also examined cultural values as a moderator and found that these patterns were primarily prevalent in women with greater European values, rather than women with bicultural values. Moreover, for women with greater European values who were instructed to suppress, greater observed nonresponsiveness mediated the associations of greater suppression with partners' perceptions of suppressors as hostile and withdrawn and with partners' greater hostile behavior.

Two studies have experimentally addressed this process in romantic relationships. In their study of 172 undergraduate couples, Richards et al. (2003) found that individuals instructed to suppress their emotions during a conflict discussion made fewer emotional facial expressions than controls or individuals instructed to use reappraisal. Ben-Naim, Hirschberger, Ein-Dor, and Mikulincer (2013) examined 127 Israeli heterosexual cohabiting or married couples in a conflict interaction. They created three groups, one in which one partner was asked to suppress the expression of emotion, a second in which one partner was asked to focus on a positive construal of the relationship (a revision of reappraisal they named *positive mindset*), or a third group who received instructions only

to think about the topic of conflict they were about to discuss. They found that suppression was associated with increased cardiovascular arousal of both partners and increased objective ratings of expressions of contempt and disgust for both partners. Alternately, positive mindset was related to decreased cardiovascular arousal of both partners and decreased observed expressions of contempt in those who received instructions to reappraise.

Taken together, these studies suggest that expressive suppression of emotions may interrupt people's ability to respond appropriately to partners, limit the expression of appropriate affiliative behaviors, and result in contemptuous behavior towards partners. These effects may be due to the greater physiological arousal, difficulty attending to the conversation, or greater felt negative emotion that accompanies suppression. In addition, suppression of emotional expression appears to elicit less friendly behavior and greater hostility from others. These reactions may arise, at least in part, through the others' negative interpretation of the suppressors' behaviors (i.e., lack of responsiveness may be interpreted as lack of empathy, and greater expression of contempt and disgust is likely negatively received and elicits defensiveness). Furthermore, mediational findings suggest that suppression may interfere with new relationship formation via poor communication and negative perceptions of the communicator in general. On the other hand, reappraisal is associated with enhanced emotional communication, in some cases more expression of positive emotion and more positive perceptions of communication from others. Thus, it appears reappraisal has benefits for individuals' own communication and the experiences of their interaction partners, possibly via the relationship benefits that expression of

positive emotions has been shown to provide (Carstensen et al., 1995; Gottman et al., 1998; Johansen & Cano, 2007).

Other Measures of Emotion Regulation and Communication

Researchers using multi-dimensional and broader measures of difficulties with emotion regulation have found similar associations of maladaptive strategies with less adaptive communication. In a study of 479 college students, Gratz and Roemer (2004) found that the total sum of difficulties across multiple domains of emotion regulation was related to fewer self-reported displays of both positive and negative emotions. In two samples of 457 and 528 undergraduates, Hofman and Kashdan (2010) found that self-reported tendencies to conceal emotions were related to less self-reported expression of negative and positive emotions to others. Tendencies to adjust emotions were related to less negative emotion expressivity but were unrelated to expression of positive emotions. In contrast, tendencies to tolerate emotions were related to greater positive and negative emotion expressivity, suggesting that tolerating emotions produces the most emotional communication of these three regulatory tendencies. In an observational study of a conflict resolution task with 225 pairs of mothers and their daughters between the ages of 9-10, Feng and colleagues (2009) found that daughters whose mothers rated them as better able to modulate the intensity and duration of sadness in general expressed more positive emotion during the task, as coded by observers. Pond and colleagues (2012) evaluated negative emotion differentiation (i.e., operationalized as greater variability in day-to-day self-reported negative emotions) in 186 college students in a 21-day daily diary study. They found that college students with greater differentiation of negative

emotions showed fewer daily aggressive behaviors (such as saying critical things or slamming doors) in response to provocation than people who demonstrated lower emotion differentiation. Together, it appears that emotional communication, particular greater expression of positive emotions and less aggressiveness, is enhanced by overall emotion regulatory skill.

Summary

Across multiple types of participants, relationships, measures, and methodologies, emotion regulation shows clear associations with interpersonal communication. Overall maladaptive emotion regulation and specific ineffective techniques, such as suppressing or concealing feelings, appear to lead to less expression of emotion, less responsiveness to partners, fewer affiliative behaviors, and more hostile responses from others. Some results further suggested that nonresponsiveness in particular lessens feelings of rapport in conversation partners. On the other hand, more adaptive emotion regulation strategies, such as reappraisal, adjusting and tolerating emotions, and emotion differentiation, appear related to more expressions of emotion (positive emotion in particular), more affiliative behaviors, and fewer aggressive behaviors. As expression of emotions is important to relationship formation, maintenance, and intimacy, reduced emotion expression may explain some of the connection between these emotion regulation techniques and relationship functioning explored in the previous section.

Emotion Regulation and Perceptions of Communication

Finally, it is also important to consider how emotion regulation affects the receipt of communication from another person. Individuals' emotion regulation may affect how

they perceive communication from others, and how others perceive communication from them. How people perceive messages from others is just as important as (if not more important than) the actual communication that happens (e.g., Bradbury and Karney, 1993), as people generally act based on their interpretations of situations. This process may be strongly affected by state emotions as well as emotion regulation. Distinct emotions are linked to distinct perceptual tendencies, as noted above (e.g., Keltner et al., 1993; Lerner et al., 1998; Smith & Mumma, 2008). Thus, if someone is in an angry state, they may be more likely to perceive communication from a partner as hostile or unfair; in a sad state, they might be more prone to interpret communication as hurtful; in an anxious state, they might interpret communication as dangerous. Furthermore, to the extent that individuals are physiologically overaroused and feeling intense emotions, they may have a narrowing of attention to negative aspects of partner behavior. Thus, the degree to which individuals are able to effectively regulate their emotions can, in turn, impact their perceptions of their partners' communication.

It is likely that a reciprocal relationship exists: cognitive perceptions of events contribute to how emotions are regulated and how emotions are regulated can also affect how events are perceived. A limited amount is known about how emotion regulation affects perceptions of communication from others, although some studies provide relevant information. Cheung and Park (2010) found that college students' general use of suppression of anger was related to lower self-reported perceived quality of communication with their parents, which included items assessing perceptions of both the students' and parents' communication. In a study of children ages 9-12, Jaffe, Gullone,

and Hughes (2010) found that children who reported greater tendencies to use reappraisal perceived more parental caring behaviors and fewer parental behaviors of overprotectiveness, whereas children who reported more habitual expressive suppression showed the opposite pattern of associations. Bloch et al. (2014) found that quicker downregulation of behavior in wives and husbands after negative arousal in couples' discussions was positively associated with their own perceptions of constructive communication in their relationship in general. Also, for wives only, these perceptions of constructive communication mediated the positive association between their downregulation of behavior and their marital satisfaction over time. Barnow and colleagues (2009) found that people with borderline personality disorder judged the personalities of individuals in short film clips as less positive and more negative than did healthy controls, and as more aggressive than did either healthy controls or those with depression. Also, Hooley, Siegle, and Gruber (2012) found that when depressed, recovered, and healthy participants heard criticism from their mothers, those who reported higher levels of overall perceived criticism showed greater amygdala and decreased prefrontal cortex activity, both of which are associated with emotion regulation. Thus, individuals appear to engage emotion regulation processes when confronted with criticism from others.

Furthermore, findings from two studies suggest that people's perception of *others'* emotion regulation is related to their perceptions of others' communication. Impett et al. (2014) found that perceptions of partner suppression during sacrifice daily and in the laboratory discussions were associated with fewer perceptions of that partner's

authenticity. Second, when patients' perceptions of doctors have been examined (Kafetsios, Anagnostopoulos, Lempesis, & Valindra, 2014), patients who perceived their doctors as having better emotion regulation reported more perceptions of positive communication and fewer perceptions of negative communication from their doctor.

Although studies in this area are limited, the few studies mentioned provide some initial evidence that emotion regulation relates to how communication is perceived. Greater activation of brain areas associated with emotion regulation was present in people who tended to perceive more criticism. Suppression was related to perceiving lower quality communication with close others and partners of people who suppressed tended to see suppressors' communication in a negative light. Alternately, reappraisal was associated with more positive perceptions of communication from parents. Given the relationship of reappraisal to more positive social outcomes, romantic partners of people who regulate emotions through reappraisal may perceive their communication more positively, though this has not been directly studied. Missing from these studies, however, is a more comprehensive examination of emotion regulation itself and *both* conversation partners' perceptions and actions. Furthermore, studies that measure observed behavior are also needed so that direct comparisons of perceptions and actions can be made, to see if biases are present or if communication behaviors are perceived more accurately with better emotion regulation.

General Discussion and Future Directions

This review demonstrates several important points about emotion regulation, communication, and interpersonal relationships. First, it appears that individual emotion

regulation capabilities and strategies are associated with relationship outcomes both within individuals and across partners within dyads. In particular, reappraisal is typically linked with positive outcomes and suppression is linked with poorer relationship outcomes. Communication quality and perceptions of communication appear to be avenues by which emotion regulation affects relationship quality. Individuals' suppression has been linked to poor communication, notably a lack of expression or hostile communication, and also appears to elicit negative responses from interaction partners. Alternately, reappraisal and adaptive emotion regulation in general have been linked greater affiliative behavior and less negative communication. Moreover, poor regulation appears to contribute to more negative perceptions of partners' communication, further affecting the overall perceived quality of interactions and, more broadly, the relationship.

A number of studies used meditational models to examine the associations among emotion regulation, communication delivery and perception, and social or relationship functioning concurrently (Butler et al., 2003; Butler et al., 2007; Le & Impett, 2013) and over time (Bloch et al., 2014; Finkel et al., 2013; Impett et al., 2012; Impett et al., 2014). Findings supported several variables as potential mediators of these links, including feeling or being perceived as inauthentic, seeming nonresponsive, perceiving communication as less constructive, and experiencing greater distress due to conflicts. Further research on these and other potential mediators, particularly within romantic relationships, would inform our understanding of what parts of the emotion generation

and communication process are most important for couple functioning and what would be the best targets for therapy.

With particular regard to intimate relationships, there is a need to evaluate whether regulation strategies like expressive suppression are ineffective in all instances. Some studies suggest that suppression of hard emotions, such as anger, might have the potential to be beneficial to relationships, even if detrimental to an individual's immediate experience (e.g., by preventing escalation into an argument). Also, suppression during times of sacrifice for the partner may be good for individuals' well-being and their relationship quality, if it is consistent with their values. There may be other circumstances in which suppression of emotions may be necessary, such as when the expression of strong emotions might be inappropriate (e.g., in a work meeting or large family gatherings). Although a more effective strategy like reappraisal might be even more useful in such situations, suppression may be superior to no strategy or some other type of maladaptive regulation. Moreover, there are specific contexts in which reappraisal may not be good for individual or relationship functioning (e.g., reinterpreting anger arising from violence or oppression).

Finally, though reappraisal and suppression have strong predictive validity and construct validity, other measures of emotion regulation may enhance our knowledge. For instance, measures that more broadly tap *flexible* use of emotion regulation strategies given the context and specific emotion may account for additional variation. In addition, measures that clearly differentiate emotion regulation from communication and personal or relational distress are needed in relationship research. Ratios of positive to negative

emotional communication in couples' discussions may be good outcome measures for how well or poorly emotion regulation is working to influence communication. However, such ratios may be less helpful as operationalizations of emotion regulation in studies wishing to examine how internal regulatory strategies affect interpersonal communication, as such measures confound communication with emotion regulation.

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Biography

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