Interpersonal emotion regulation contagion: Effects on strategy use and affect

Thesis

Presented in Partial Fulfillment of the Requirements for the Degree Master of Arts in the Graduate School of The Ohio State University

By

Kara Alise Christensen, A.B.

Graduate Program in Psychology

The Ohio State University

2015

Thesis Committee

Amelia Aldao, Ph.D., Advisor

Jennifer Crocker, Ph.D.

Michael Vasey, Ph.D.
Abstract

Recent research suggests that people frequently rely on others in order to regulate their affective states (e.g., Zaki & Williams, 2013). Although such interpersonal regulation may help enhance psychological and physical well-being, there is growing evidence suggesting there may also be negative consequences. First, there is some evidence that the use of maladaptive emotion regulation strategies may be contagious. For example, when one member of a dyad uses rumination, the other increasingly adopts this strategy as well (e.g., Haefel & Hames, 2014; Stone & Gibb, 2015). Second, the joint use of rumination has been linked with the presence of symptoms of mental disorders (e.g., Rose, Schwartz-Mette, Glick, Smith, & Luebbe, 2014). Despite these advances, much remains to be understood about the joint utilization of other ER strategies, such as worry (putatively maladaptive) and acceptance (putatively adaptive). Doing so is particularly important because such strategies play a central role in mental health and well-being (e.g., Aldao et al., 2010). Because maladaptive strategies have a stronger link with mental health than putatively adaptive strategies, I expected an asymmetric contagion effect, such that worry would “spread” more than acceptance. I induced 74 female undergraduates to use worry or acceptance (within-subjects) before interacting with a female confederate who was engaging in either worry or acceptance (between-subjects). Then I examined two effects while watching disgust-eliciting videos: 1) use of emotion regulation strategies, and 2) affective ratings. I found that participants
who interacted with a worrying confederate reported more use of worry than those who interacted with an accepting confederate. When participants were induced to accept their emotions, they had greater anxiety and disgust when they interacted with a worrying confederate as compared to an accepting confederate. However, when participants were induced to worry about their emotions, interacting with an accepting confederate had no impact on their emotional experience. These effects were more pronounced in chronic worriers, which suggests that these individuals might be at greater risk for negative contagion effects of maladaptive strategies. In all, these findings build upon the literature proposing that maladaptive strategies play a stronger role in mental health than the adaptive ones and suggest that chronic worriers may be more sensitive to contagion effects of maladaptive strategies than non-chronic worriers.
I gratefully acknowledge all of the guidance and support given to me in completing this project by my advisor, Amelia Aldao, and my colleagues, Lee Dunn, Ilana Seager, Andre Plate, and Anne Wilson. I am also much indebted to our hardworking undergraduate research assistants who allowed us to collect this data, in particular Jennifer Merz, Briana Smoot, and Brittany Woods. Finally, I would like to thank my committee members, Theodore Beauchaine, Jennifer Crocker, and Michael Vasey, for their constructive feedback and advice in preparing and writing my thesis.
Vita

2007 ................................................................. Academic Magnet High School
2011 ................................................................. A.B., Psychology with Honors, The University of Chicago
2013 to present .............................................. Distinguished University Fellow, The Ohio State University
2013 to present .............................................. Graduate Teaching Association, Department of Psychology, The Ohio State University

Publications


**Fields of Study**

Major Field: Psychology.
# Table of Contents

Abstract ...................................................................................................................................................... ii

Acknowledgements........................................................................................................................................ iv

Vita................................................................................................................................................................ v

Fields of Study........................................................................................................................................... v

Table of Contents ...................................................................................................................................... vii

List of Tables ............................................................................................................................................... ix

List of Figures ............................................................................................................................................. x

Chapter 1: Introduction............................................................................................................................... 1

  Expanding the Literature on Interpersonal ER....................................................................................... 4

Chapter 2: Methods ....................................................................................................................................... 9

  Participants.................................................................................................................................................. 9

  Self-Report Measures............................................................................................................................... 9

  Apparatus ............................................................................................................................................... 10

  Research Protocol ................................................................................................................................. 11

  Confederate Believability....................................................................................................................... 14
List of Tables

Table 1: Baseline block differences .................................................................................. 16
Table 2: Post-induction differences in ER and affect ....................................................... 17
Table 3: GEE models predicting post-video ER use and affect (Wald’s $\chi^2$)............... 18
Table 4: Habitual worry predicting post-video ER use and affect (Wald's $\chi^2$)............. 23
Table 5: Habitual acceptance predicting post-video ER use and affect (Wald’s $\chi^2$).... 26
List of Figures

Figure 1: Dyadic Interactions study flow................................................................. 11
Figure 2: Use of worry during the videos ................................................................. 20
Figure 3: Experience of anxiety during the videos .................................................. 21
Figure 4: Experience of disgust during the videos .................................................. 22
Figure 5: Three-way interaction predicting use of worry ....................................... 24
Chapter 1: Introduction

In the past two decades, there has been an exponential increase in research utilizing the emotion regulation (ER) framework (i.e., the process by which individuals alter the onset, duration, and intensity of their emotions; Gross, 1998; 2013). However, ER has primarily been studied as an *intrapersonal* process, despite the evidence that these processes often occur in social contexts (Gross, 1998, 2013; Zaki & Williams, 2013).

Studying interpersonal processes is important given that relationships play critical roles in many aspects of our lives, beginning as children when we develop bonds with our parents, continuing through adolescence, as our peer groups become more prominent, and extending into adulthood, as we develop romantic relationships. Many theories conceptualize interpersonal difficulties as being central to psychological dysfunction, including depression (Klerman, Weissman, & Rounsaville, 1984), anxiety disorders (Parrish & Radomsky, 2011), personality disorders (Linehan, 1993), and suicidal ideation (Joiner, 2005). Thus, it comes as no surprise that psychologists have been inquiring about the functions social interactions serve vis-a-vis psychological functioning (see Hofmann, 2014; Rimé, 2009b; Zaki & Williams, 2013). Given the personal, social, and economic costs of mental disorders, it is clear that understanding how people use, or fail to appropriately use, their social relationships to bolster well-being is an important task for the ER literature.
Thus, interpersonal ER constitutes an important shift in approach to the study of dysfunction in adults. Notably, since this work is in its infancy, it is not surprising that the conceptualization and operationalization of interpersonal ER is characterized by substantial heterogeneity (e.g., Dixon-Gordon, Bernecker, & Christensen, 2015). For example, the term “interpersonal ER” has been used to describe both deliberate attempts to alter one’s/others emotions through social contact (e.g., Niven, Totterdell, & Holman, 2009) as well as indirect results of emotional expression (e.g. anxiety-transfer, Parkinson & Simons, 2012).

There is a possibility that through the use of ER strategies in social contexts, individuals may begin to converge in similarity of strategy use, through what may be termed “ER contagion.” For example, one member of a dyad may, over time, adopt certain ER strategies (i.e. rumination) from the other member (e.g., Haeffel & Hames, 2014; Stone & Gibb, 2015). Work on ER contagion is critical given that people often engage with others who may habitually apply different strategies than they do and may further take their regulation cues from others (for better or worse). For example, people may even choose to switch strategies as a result of social interaction. Furthermore, the mismatches in response from regulation partners may lead to increases or decreases in affect (e.g., Parkinson & Simons, 2012). Previous research suggests that social interactions may fulfill an affiliative function (Rimé, 2009a) and thus, engaging in similar strategies may serve as a form of mimicry by which individuals feel increased levels of emotional closeness (Fischer & Manstead, 2010). Interacting with others may also help the individual trying to regulate their emotions reduce the level of threat they feel (Blascovich, Mendes, Hunter, & Salomon, 1999) and signal safety by tacitly validating
the choice of ER strategy. By contrast, interacting with someone using a different strategy may signal incorrect usage of a strategy.

The literature to date has primarily focused on the interpersonal use of rumination, termed co-rumination, which has been defined as the excessive discussion of problems with others and includes engaging in problem talk and speculation, rehashing the past, and dwelling on negative affect (Rose, 2002). Relatedly, the intrapersonal use of rumination (focusing on causes and consequences of distress) has been positively associated with a wide range of mental disorders and, as such, is considered to be maladaptive (e.g., Aldao, Nolen-Hoeksema, & Schweizer, 2010; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Notably, its joint use has detrimental associations with mood and physiology, including increases in prospective depression and anxiety (Rose, 2002; Rose, Carlson, & Waller, 2007), as well as in stress hormone levels, such as cortisol (Byrd-Craven, Geary, Rose, & Ponzi, 2008) and salivary alpha-amylase (Byrd-Craven, Granger, & Auer, 2011). Additionally, it has been found to mediate the relationship between social support and workplace burnout (Boren, 2013). Furthermore, in a study of adolescents, co-rumination has been found to be a double-edged sword: girls who reported engaging in higher levels of co-rumination also endorsed greater closeness in their friendships; however, they also reported more symptoms of depression and anxiety six months later (Rose et al., 2007).

Germane to this thesis, in one study examining the “contagion” effects of rumination in a sample of college freshmen who had been randomly assigned to live with each other, those who had been paired a roommate who reported high levels of rumination were more likely themselves to develop higher levels of rumination after three
months (Haeffel & Hames, 2014). Furthermore, this change in rumination corresponded with an increase in depression symptoms. Interestingly, those paired with a roommate with low levels of rumination experienced decreases in their own levels of rumination.

**Expanding the Literature on Interpersonal ER**

As the topic of interpersonal ER is a relatively newer area of inquiry, there are several potential areas for growth. First, the extant literature has primarily adopted a correlational approach (e.g., Haeffel & Hames, 2014; Rose, 2002; Rose et al., 2007; Stone & Gibb, 2015) and thus, much remains to be uncovered about the mechanisms underlying the development and maintenance of patterns of this process. In other words, while the link between some co-regulatory processes and mental health is relatively clear, the mechanisms underlying the reinforcement of these processes over time remain to be identified. Pursuing such an understanding is essential given both the physiological and mental health outcomes that are associated with co-regulatory behavior (e.g., Byrd-Craven et al., 2008; Rose, 2002; Rose et al., 2007).

Second, because the majority of this literature is on co-rumination, much less is known about the joint use of other ER strategies that are associated with mental health. Recent meta-analytic work has suggested that strategies such as reappraisal, acceptance and problem solving are effective at modifying affect in controlled laboratory settings and have negative association with symptoms of psychological disorders, which has lead to their classification as adaptive (e.g., Aldao et al., 2010; Webb et al., 2012). By contrast, strategies such as rumination, avoidance, and suppression are less effective at changing affect in the lab and share positive associations with symptoms of psychological disorders, which has lead to their classification as maladaptive. The strategy of worry, a
form of future-oriented perseverative thought akin to rumination, is a core feature of
generalized anxiety disorder (GAD) and contributes to the intensification and
maintenance of symptoms (e.g., Borkovec, Alcaine, & Behar, 2004).

Notably, putatively adaptive strategies tend to have a weaker link to mental health
than the putatively maladaptive strategies, thus suggesting that the detrimental effects of
maladaptive strategies might be more pronounced than the beneficial effects of adaptive
strategies (e.g., Aldao & Nolen-Hoeksema, 2012, Aldao, Jazaieri, Goldin, & Gross, 2014;
Plate, Aldao, Quintero, & Mennin, in prep). Thus, it is sensible to expect that there may
be an asymmetry in the associations between ER and affective outcomes. Of particular
importance is the examination of whether the asymmetry in the association between
strategies and mental health is also reflected when these strategies are used
interpersonally. It is possible that such interpersonal use may lead to the adoption of
strategies intrapersonally (e.g., Haeffel & Hames, 2014; Stone & Gibb, 2015) and thus,
that we might also expect maladaptive strategies to be more contagious than adaptive
strategies.

In this thesis, I have sought to further the research on the interpersonal use of ER
strategies by adopting an experimental approach to better understand the underlying
mechanism of contagion. In particular, I tested whether the intrapersonal induction of a
strategy and subsequent interaction with a confederate using the same or a different
strategy influenced the use of strategies and self-reported affect during disgust-eliciting
film clips. I expanded the examination of interpersonal ER strategies beyond co-
rumination to include a similar putatively maladaptive strategy, worry (i.e., perseverative
thought about uncertain future outcomes), and a putatively adaptive strategy, acceptance
(i.e., non-judgmental allowance of emotional experience) (e.g., Aldao et al., 2010; Borkovec et al., 2004; Hayes, Strosahl, & Wilson, 1999).

I focused on the ER strategy of worry in order to expand our understanding of the ways in which people utilize social support. While the co-rumination research has begun to address how people affiliate to seek clarity about past events, there are still gaps in our understanding about how people utilize social contacts to seek clarity about future events. Thus, studying the future-oriented ER strategy of worry allows us to understand more about how people use ER interpersonally when anticipating situations and how this may influence future affect. Much like rumination, worry results in the paradoxical perpetuation of undesired negative affect (i.e. anxiety, e.g., Borkovec et al., 2004; Mennin & Fresco, 2013; Roemer, Orsillo, & Salters-Pedneault, 2008). In an unpublished master’s thesis, habitual co-worry was associated with higher levels of depression and anxiety in female adolescents and lower symptoms in males (Dombrowski, 2014). It may be transferred interpersonally (see review in Parkinson & Simons, 2012), making it an important target for research focusing on interpersonal contagion effects.

In contrast to worry, acceptance is an ER strategy that entails allowing oneself to experience emotions without judging or seeking to change them (Hayes et al., 1999). Although no studies have measured the joint use of acceptance, the positive associations of acceptance with psychological adjustment suggest that it could be a promising source of interpersonal ER. Individuals who engage in higher levels of acceptance have lower symptoms of various forms of psychopathology (Aldao et al., 2010), including anxiety (McLaughlin, Mennin, & Farach, 2007), depression (Jimenez, Niles, & Park, 2010) and borderline personality disorder (Wupperman, Neumann, & Axelrod, 2008). In addition,
the use of mindfulness has been associated with better interpersonal functioning (Brown, Ryan, & Creswell, 2007).

Despite the growing emphasis upon the use of acceptance in therapeutic settings and as a component of treatment for those with interpersonal difficulties (e.g., Fresco, Mennin, Heimberg, & Ritter, 2013; Hayes et al., 1999; Linehan, 1993; Segal, Williams, & Teasdale, 2012), there has been no systematic examination of how acceptance might influence strategy use and/or affect in interpersonal situations. Similarly, there is little information regarding whether ER strategies such as acceptance might be “contagious.” Given the beneficial aspects of acceptance as an intrapersonal ER strategy, it becomes important to examine how it functions interpersonally. Thus by examining its use in tandem with that of worry, I sought to shed light onto the mechanisms by which people can switch from one to the other as a function of interacting with others modeling this form of regulation.

Given the potential ability of worry to be contagious (e.g., Parkinson & Simons, 2012), I predicted that there would be an interaction effect between the type of ER strategy induced in the participant and the type of ER strategy used by the confederate. Specifically, I hypothesized that when participants were induced to accept their emotions, those who interacted with an accepting confederate would report greater use of acceptance and lower experience of anxiety and disgust than those who interacted with a worrying confederate. Similarly, I expected that when participants were induced to worry, those who interacted with a worrying confederate would report greater use of worry and greater experience of anxiety and disgust than those who interacted with an accepting confederate. However, given the literature on asymmetric relationships among
the strategies and mental health, I expected that the contagion effects of worry would be
more pronounced than the contagion effects of acceptance, such that the confederate’s
use of worry would result in greater use of worry and negative affect than the
confederate’s use of acceptance would result in greater use of acceptance and lower
negative affect.

I also had two exploratory hypotheses regarding individual differences in habitual
ER use. I predicted that those high in worry and those high in acceptance would be more
susceptible to contagion effects of the ER strategy that matched their habitual use (worry
and acceptance, respectively) than those who were low in these ER strategies.
Chapter 2: Methods

Participants

The sample consisted of 74 female undergraduate students drawn from the Research Experience Program (REP) pool at The Ohio State University from September to December 2014. Given the gender effects found with co-rumination (e.g., Rose et al., 2007) and co-worry (e.g., Dombrowski, 2014), I used only female participants to avoid confounding effects of gender. Seven participants were excluded from final data analysis (data loss due to computer programming error, N = 4; participant inattention, N = 1, self-identifying as a gender other than female, N = 2). The final analytic sample thus consisted of 67 participants. Participants in the final sample ranged in age from 18 to 21 years ($M_{age} = 18.6\ years$, $SD = .812\ years$). 77.6% of participants identified as Caucasian (N = 52), 11.9% as African American (N = 8), 11.9% as Asian (N = 8), 7.5% as Other (N = 5), and 1.5% as American Indian (N = 1). There were 30 participants randomized to the acceptance confederate interaction and 37 participants randomized to the worry confederate interaction. The Ohio State University Institutional Review Board approved all procedures and measures for this study and participants provided informed consent before beginning the study.

Self-Report Measures

ER measures.
**Penn State Worry Questionnaire (PSWQ).** The PSWQ (Meyer, Miller, Metzger, & Borkovec, 1990) is a 16-item self-report measure that assesses trait worry as a unidimensional construct. It captures the generality, excessiveness, and uncontrollability of worry. Items are scored on a 5-point scale, with higher scores indicating more pervasive and uncontrollable worry. The PSWQ has been extensively used to identify individuals with pathological levels of worry (Meyer et al., 1990). In this sample, it showed excellent internal reliability (α = .94).

**Acceptance and Action Questionnaire (AAQ).** The AAQ (Hayes et al., 2004) is a 9-item self-report measure of experiential avoidance, conceptualized as the tendency to avoid internal experiences, such as emotions and thoughts. Lower scores indicate greater acceptance of emotional experience. The AAQ shows adequate convergence with other measures of ER (Hayes et al., 2004). In this sample, it had good internal reliability (α = .89).

**Apparatus**

Participants completed the study while seated in front of a 46” Samsung LED TV in a quiet testing room with no windows. All audio was played via a speaker system installed in the ceiling of the testing room. Video and audio recordings of the study session were captured using the MindWare system (MindWare Technologies, Gahanna, OH).
“Fast Friends” affiliative task. Participants first completed an affiliative exercise (“Fast Friends”) with the confederate, during which they answered five questions about personal preferences (Appendix A; modified from Aron, Melinat, Aron, Vallone, & Bator, 1997). In each exchange, the confederate responded first as to reduce the likelihood of a situation in which participants directly addressed the confederate and revealed the deception. The purpose of this task was to facilitate feelings of social closeness between the confederate and the participant through the use of self-disclosure. Such exposure was intended to perpetuate the idea that the confederate was another research participant and to create an environment that allowed the participant to feel comfortable in engaging in self-disclosure about emotions.

An undergraduate research assistant played the part of the confederate. For purposes of verisimilitude, she was filmed in one of the laboratory research rooms while wearing university apparel and connected to the physiological recording equipment. I
created the responses to the Fast Friends clips by compiling responses submitted by undergraduate research assistants from the Psychopathology and Affective Sciences (PAS) Lab.

**Baseline Film Clip.** The baseline film clip (“Slot Eyeball Buffet”) was a two-minute clip showing contestants from the television show “Fear Factor” television contestants eating animal eyeballs. This clip was specifically selected to elicit high levels of anxiety and disgust. The first film clip was utilized to induce social sharing. To set up expectations about the future film clips, participants were told that the images that they would view in the future clips would intensify. Thus, the baseline clip was important for inducing anticipatory anxiety and setting the tone for the remainder of the study.¹

**Experimental Blocks.** Participants completed each block twice, once for worry and once for acceptance (the order was counterbalanced). Each block consisted of 1) ER induction phase, 2) interpersonal regulation phase, 3) film clip watching phase (see Figure 1).

1. **ER Induction Phase.** Participants listened to one ER induction per experimental block over speakers in the experimental room. Each pre-recorded induction began with instructions asking participants to listen closely and focus their attention on the prompts they would be hearing. They were then asked to focus on the thoughts or feelings that they may have. Both audiotapes contained 12 prompts read at 15-second intervals (Appendix B). During the worry block, participants listened to a 3:45 long audiotape emphasizing bodily sensations they may be having and the negative outcomes

¹ Prior to the inclusion of the videos in the study, undergraduate research assistants viewed and rated the videos on several dimensions including desire to eat, anxiety, disgust, and anxiety. They all elicited substantial levels of disgust and they did not differ from each other on any dimensions (all p’s >.1).
of this experience on the present and future. A sample prompt for worry was “Think about: How much you will dread watching the video.”

During the acceptance block participants listened to a 3:45 audiotape emphasizing the importance of allowing themselves to experience their feelings and provided a series of decentering acceptance-related prompts. Decentering entails altering one’s relationship to thoughts (as opposed to altering the thoughts themselves) and has been associated with beneficial outcomes, such as decreased reliance on repetitive thoughts and lower emotional reactivity (Feldman, Greeson, & Senville, 2010). A sample prompt for acceptance was “Think about: How you are capable of observing without reacting.”

2. Interpersonal Phase. After listening to the induction tape, participants were told that they would interact with the participant they met earlier in the study (i.e., the confederate) again before watching another video. During this interaction, the pair responded to three questions addressing how they believed they would feel in the future, their concerns about the upcoming videos, and what they believed they might see next. The confederate always responded first to reduce the risk of exposing the deception. The confederate only used one strategy (either acceptance or worry; between-subject) throughout the study.

3. Film Clip Watching Phase. After interacting with the confederate, participants watched a two-minute disgust film clip. The two counterbalanced experimental film clips consisted of contestants eating slugs and drink bile (Fear Factor, “Eat Slugs, Drink Bile”, 2:00) and of contestants chewing intestines, spitting the intestinal juice in a cup, and drinking it (Fear Factor, “Intestine Chew, Chug and Milk”, 2:00). Participants were told before the video began to focus their eyes on images on the screen without looking away.
Following that, participants were instructed to sit quietly for two-minutes without moving while a fixation cross was displayed on the screen.

**Assessment of affect and ER.** Participants completed state level measures of affect (anger, anxiety, feelings of control, hunger, disgust, excitement, and sadness) on a 100 point visual analogue scale, ranging from 0 ‘*Not at all*’ to 100 ‘*Extremely*’ at the following time points: T1) prior to the baseline disgust video, T2) after the baseline disgust video, T3) after the first ER induction and T4) after watching a 2-minute disgust video (Figure 2). Time points 3-4 repeated for the second ER block. Of particular interest were ratings of use of ER strategies (T2, T3, T4) and affect during the experimental block (T2-T4).

**Confederate Believability**

At the conclusion of the study, participants were asked three open-ended manipulation check questions (“Did you notice anything unusual about the study?”; “Did you notice anything unusual about the other participant?”; “What do you think was the purpose of the study?”). Three research assistants blinded to study purpose and participant conditions coded the responses to all three of these questions on a 5-point Likert scale (0 = *Not at all*, .25 = *mostly not*, .5 = *neutral*, .75 = *mostly believed*, 1 = *fully believed*) for each participant to create a score that reflected how much the subject believed the confederate to be a true research participant. There was a relatively strong association between the three raters (Cramer’s V = .485; Healey, 2015). I averaged the score of the raters for the overall believability score. The mean believability score of the sample was .64 (*SD* = .34) suggesting that the majority of participants believed the manipulation.
**Statistical Analysis**

First, I examined the questionnaire data to make sure it met assumptions of normality and identified and removed outliers (3+/− standard deviations from the mean). If trait variables were substantially skewed, I applied transformations (e.g., square root, logarithmic, inverse) to create a skew of <2.

Then, I ran t-tests to determine if there were differences in affect pre-baseline video and in affect and spontaneous ER during the baseline video. For my manipulation check of ER induction, I ran t-tests examining group differences in affect and ER use post-induction.

To test my main analyses, I ran generalized estimating equation (GEE; Ghisletta & Spini, 2004) models predicting emotion and/of use of ER strategies during the disgust videos with interpersonal interaction (confederate acceptance, confederate worry) and induction (acceptance, worry). I included believability as a covariate. I also examined how the habitual use of worry and/or acceptance moderated the interactions between induction and interaction.
Chapter 3: Results

Manipulation Checks

Baseline block differences. I ran a series of independent sample t-tests to determine if there were differences during the baseline disgust film clip in terms of use of ER strategies and affect (Table 1). There were no differences between participants assigned to interact with a worrying or accepting confederate in terms of use of worry, \( t \) (65) = -0.564, \( p = .570 \), \( CI = -15.680, 8.777 \), \( d = -0.140 \); use of acceptance, \( t \) (65) = -1.260, \( p = .212 \), \( CI = -20.221, 4.580 \), \( d = -0.313 \); anxiety, \( t \) (65) = 0.527, \( p = .600 \), \( CI = -8.180, 14.037 \), \( d = 0.131 \); and disgust, \( t \) (65) = -0.337, \( p = .737 \), \( CI = -18.923, 13.460 \), \( d = 0.084 \).

<table>
<thead>
<tr>
<th></th>
<th>Confederate Acceptance Mean (SD)</th>
<th>Confederate Worry Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-baseline video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of worry</td>
<td>18.900 (24.547)</td>
<td>22.351 (25.220)</td>
</tr>
<tr>
<td>Use of acceptance</td>
<td>60.233 (23.747)</td>
<td>68.054 (26.439)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>18.766 (24.941)</td>
<td>15.838 (20.600)</td>
</tr>
<tr>
<td>Disgust</td>
<td>49.133 (35.468)</td>
<td>51.864 (30.866)</td>
</tr>
</tbody>
</table>

Table 1: Baseline block differences

---

2 There were no significant differences before the baseline video in self-reported anxiety, \( t \) (65) = -0.041, \( p = .967 \), \( CI = -12.393, 11.894 \), \( d = 0.010 \), or disgust, \( t \) (65) = -0.740, \( p = .462 \), \( CI = -4.135, 1.899 \), \( d = -0.184 \).
**Post-ER induction differences.** To determine if the ER induction was successful, I ran t-tests comparing the acceptance and worry inductions in terms of use of ER strategies and affect (Table 2). There was significantly greater use of worry following the worry induction than following the acceptance induction, $t(132) = 2.587, p = .011, CI = 2.616, 19.623, d = .450$. Conversely, there was significantly greater use of acceptance following the acceptance induction than the worry induction, $t(132) = -2.397, p = .018, CI = -20.595, -1.973, d = -.417$. Moreover, there was significantly greater anxiety and disgust following the worry induction compared to the acceptance induction, $t(132) = -3.030, p = .003, CI = -22.376, -4.699, d = -.527$, and $t(132) = -6.247, p < .001, CI = -35.215, -18.277, d = -1.087$, respectively.

<table>
<thead>
<tr>
<th></th>
<th>Acceptance Induction Mean (SD)</th>
<th>Worry Induction Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use of worry</strong></td>
<td>18.522 (23.706)</td>
<td>29.806 (30.373)*</td>
</tr>
<tr>
<td><strong>Use of acceptance</strong></td>
<td>68.896 (23.769)</td>
<td>57.776 (25.946)*</td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td>13.239 (22.293)</td>
<td>26.776 (28.995)**</td>
</tr>
<tr>
<td><strong>Disgust</strong></td>
<td>7.716 (17.200)</td>
<td>34.463 (30.533)**</td>
</tr>
</tbody>
</table>

^ < .1, * < .05, ** < .01, *** < .001

Table 2: Post-induction differences in ER and affect
Post-video differences. Given that there were no differences between the confederate ER groups following the ER interaction\(^3\), I chose to use the post-video ratings for my main analyses of subsequent emotional experience and ER during the film clip. I ran four models predicting 1) use of worry, 2) use of acceptance, 3) experience of anxiety, and 4) experience of disgust during the disgust videos with induction type (no-induction baseline, worry induction, acceptance induction) and confederate ER strategy (confederate worry, confederate acceptance), and their interaction (Table 3). I controlled for believability in all the analyses. I applied Bonferroni corrections to all post-hoc comparisons.

<table>
<thead>
<tr>
<th></th>
<th>Use of worry</th>
<th>Use of acceptance</th>
<th>Anxiety</th>
<th>Disgust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Believability</td>
<td>0.487</td>
<td>2.916(^\wedge)</td>
<td>0.098</td>
<td>1.574</td>
</tr>
<tr>
<td>Induction type</td>
<td>5.987(^*)</td>
<td>1.195</td>
<td>4.735(^\wedge)</td>
<td>1.768</td>
</tr>
<tr>
<td>Confederate ER</td>
<td>3.862(^*)</td>
<td>0.172</td>
<td>1.069</td>
<td>1.680</td>
</tr>
<tr>
<td>Induction type *</td>
<td>5.590(^\wedge)</td>
<td>2.129</td>
<td>10.858(**)</td>
<td>6.913(^*)</td>
</tr>
<tr>
<td>Confederate ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^\wedge\ < .1, \ ^* < .05, \ ^** < .01, \ ^*** < .001\)

Table 3: GEE models predicting post-video ER use and affect (Wald’s \(\chi^2\))

Main Analyses

Predicting ER outcomes.

Use of worry. When predicting use of worry, there was a main effect of induction type, Wald’s \(\chi^2 = 5.987, p = .050\). Post hoc comparisons revealed that worry was greater during the worry video than during the baseline video, mean difference = 7.409, SE =

\(^3\) There was no main effect of confederate ER strategy on post-interaction anxiety or disgust, Wald’s \(\chi^2 = 1.543, p = .214\) and Wald’s \(\chi^2 = 1.832, p = .176\), respectively
3.082, \( p = .049, CI = -14.787, -.030 \). It did not differ between the worry video and acceptance video, \textit{mean difference} = 1.56, \( SE = 2.774, p =1.000, CI = -5.076, 8.204 \) or between the acceptance video and the baseline video, \textit{mean difference} = 5.845, \( SE = -3.196, p = .202, CI = -13.495, 1.805 \). There was also a main effect of confederate ER use, \textit{Wald’s }\chi^2 = 3.862, \( p = .049 \), such that those participants who interacted with the worrying confederate reported greater usage of worry than those who interacted with the accepting confederate, \textit{mean difference} = 11.217, \( SE = 5.708, p = .049, CI = .030, 22.404 \).

Importantly, there was a marginal interaction between induction type and confederate ER strategy, \textit{Wald’s }\chi^2 = 5.590, \( p = .061 \) (Figure 2). During the acceptance and worry blocks, participants who interacted with a worrying confederate reported significantly greater use of worry than those who interacted with an accepting confederate, \textit{mean difference} = 16.715, \( SE = 6.634, p = .012, CI = -29.718, -3.711 \), and \textit{mean difference} = 14.532, \( SE = 7.080, p = .040, CI = -28.409, -6.54 \), respectively. There was no difference in use of worry during the baseline block, \textit{mean difference} = 2.404, \( SE = 6.335, p = .704, CI = -10.011, 14.812 \).
Use of acceptance. When predicting use of acceptance, there were no significant main effects of induction type or confederate ER strategy use, Wald’s $\chi^2 = 1.194, p = .550$ and Wald’s $\chi^2 = 1.172, p = .678$, respectively. There was also no significant two-way interaction between induction type and confederate ER strategy, Wald’s $\chi^2 = 2.129, p = .345$.

Predicting affective outcomes.

Anxiety. When predicting the experience of anxiety, there were no main effects of ER induction, Wald’s $\chi^2 = 4.735, p = .094$, or of confederate ER strategy, Wald’s $\chi^2 = 1.069, p = .301$. However, the two-way interaction between confederate ER strategy and induction type was significant, Wald’s $\chi^2 = 10.858, p = .004$ (Figure 3).

Post hoc comparisons revealed that during the acceptance block, participants who interacted with a worrying confederate reported higher levels of anxiety than those who interacted with an accepting confederate, mean difference = 13.894, $SE = 5.243, p = .026$,
CI = 1.658, 26.130. Interestingly, during the worry block, the type of strategy used by the confederate had no effect on anxiety levels, mean difference = 7.488, SE = 6.577, p = .255, CI = -5.403, 20.379.

![Experience of anxiety](image)

Figure 3: Experience of anxiety during the videos

**Disgust.** When predicting the experience of disgust, there were no significant main effects of induction type or confederate ER, *Wald’s χ²* = 1.768, *p* = .413 and *Wald’s χ²* = 1.680, *p* = .195, respectively. There was a significant two-way interaction between induction type and confederate ER, *Wald’s χ²* = 6.913, *p* = .032 (Figure 4).

As was the case with anxiety, post hoc comparisons revealed that during the acceptance block, participants who interacted with a worrying confederate reported higher levels of disgust than those who interacted with an accepting confederate, *mean difference* = 17.697, *SE* = 7.727, *p* = .022, CI = 2.552, 32.841. Also similar to the results for anxiety, during the worry block, the type of strategy used by the confederate had no

**Figure 4: Experience of disgust during the videos**

**Secondary Analyses: Examining Individual Differences**

I ran the same models predicting ER strategy (i.e., use of worry, use of acceptance) and affective outcomes (i.e., anxiety, disgust) during the videos using habitual use of worry (Table 4) and habitual use of acceptance (Table 5) while controlling for believability. I applied Bonferroni corrections to all post-hoc comparisons.

**Habitual worry (PSWQ).** There was a main effect of habitual worry on use of worry, *Wald’s χ²* = 12.884, *p* < .001, and experience of anxiety, *Wald’s χ²* = 10.100, *p* = .001, such that higher habitual worry predicted greater worry and anxiety in response to the videos (Table 4). It did not predict the use of acceptance, *Wald’s χ²* = 1.617, *p* = .204, or the experience of disgust, *Wald’s χ²* = 1.308, *p* = .253. There was a two-way
interaction between habitual worry and induction type predicting use of worry, \(Wald's \chi^2 = 11.396, p = .003\); however, it was qualified by a three-way interaction among induction type, confederate ER strategy, and habitual worry, \(Wald's \chi^2 = 10.475, p = .005\).

<table>
<thead>
<tr>
<th></th>
<th>Use of worry</th>
<th>Use of acceptance</th>
<th>Anxiety</th>
<th>Disgust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Believability</td>
<td>1.748</td>
<td>2.161</td>
<td>0.927</td>
<td>2.470</td>
</tr>
<tr>
<td>PSWQ</td>
<td>12.884***</td>
<td>1.617</td>
<td>10.100***</td>
<td>1.308</td>
</tr>
<tr>
<td>Induction type</td>
<td>1.540</td>
<td>18.178***</td>
<td>0.362</td>
<td>3.163</td>
</tr>
<tr>
<td>Confederate ER</td>
<td>0.034</td>
<td>0.018</td>
<td>0.141</td>
<td>0.042</td>
</tr>
<tr>
<td>Induction type *</td>
<td>11.396**</td>
<td>2.000</td>
<td>1.242</td>
<td>2.482</td>
</tr>
<tr>
<td>confederate ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSWQ * induction</td>
<td>0.471</td>
<td>16.563***</td>
<td>0.603</td>
<td>4.016</td>
</tr>
<tr>
<td>type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSWQ * confederate ER</td>
<td>0.362</td>
<td>0.000</td>
<td>0.071</td>
<td>0.191</td>
</tr>
<tr>
<td>PSWQ * induction</td>
<td>10.475**</td>
<td>1.201</td>
<td>2.655</td>
<td>1.092</td>
</tr>
<tr>
<td>type * confederate ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{^*} < .1, ^{*} < .05, ^{**} < .01, ^{***} < .001\)

Table 4: Habitual worry predicting post-video ER use and affect (\(Wald's \chi^2\))

I broke down the three-way interaction by using a median split for the PSWQ to examine effects in participants low and high in habitual worry (Figure 5). In the low habitual worry group, there were no significant main effects of induction type or confederate ER strategy and no interaction between induction type and confederate ER strategy (all \(p\)'s > .163).

In the high habitual worry group, there was a marginal main effect of confederate strategy, \(Wald's \chi^2 = 3.808, p = .051\), such that those participants who interacted with the
worrying confederate reported more worry compared to those who interacted with the accepting confederate, \textit{mean difference} $= 5.376$, SE $= 7.880$, $p = .051$, CI $= -0.067, 30.820$. This was qualified by a significant two-way interaction between induction type and confederate ER strategy, Wald’s $\chi^2 = 6.320$, $p = .042$. During the acceptance block, participants who interacted with the worrying confederate reported greater use of worry than those who interacted with the accepting confederate, \textit{mean difference} $= 28.882$, SE $= 9.237$, $p = .002$, CI $= 10.778, 46.986$. There was no difference when participants were interacting with the worrying confederate or during the baseline by confederate ER strategy (all $p$’s $> .185$). Taken together, these findings such that habitual worriers seem to be more susceptible to the contagion effects of worry.

![Figure 5: Three-way interaction predicting use of worry](image-url)

Figure 5: Three-way interaction predicting use of worry
There was also a two-way interaction between habitual worry and induction type predicting use of acceptance $Wald's \chi^2 = 16.563, p < .001$. I again used a median split to examine effects of those high and low in habitual worry. During the acceptance video, those high in habitual worry reported lower use of acceptance than those low in habitual worry, mean difference $= -18.903, SE = 5.812, p = .001, CI = -30.294, -7.511$, suggesting difficulty in “letting go” of their typical pattern of ER. Interestingly, during the worry video, participants high and low in habitual worry had no difference in use of acceptance, mean difference $= .583, SE = 6.290, p = .926, CI = -11.746, 12.912$. The three-way interaction was not significant ($p = .561$).

There were no other significant two-way interactions between PSWQ and induction type or habitual worry and confederate ER (all $p$’s > .134) or three-way interactions on experience of anxiety or disgust (all $p$’s > .265).

**Habitual acceptance (AAQ).** There was a main effect of habitual acceptance on worry, $Wald's \chi^2 = 14.297, p < .001$; anxiety, $Wald's \chi^2 = 13.289, p < .001$; and disgust, $Wald's \chi^2 = 24.248, p < .001$ (Table 5). Participants reporting lower habitual use of acceptance reported higher worry, anxiety, and disgust. There was no main effect of habitual acceptance on use of acceptance during the videos, $Wald's \chi^2 = .262, p = .609$. There were no two-way interactions between AAQ and induction type or habitual acceptance and confederate ER (all $p$’s > .118) or three-way interactions on any of the measured outcomes (all $p$’s > .194).
<table>
<thead>
<tr>
<th></th>
<th>Use of worry</th>
<th>Use of acceptance</th>
<th>Anxiety</th>
<th>Disgust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Believability</td>
<td>1.255</td>
<td>2.624</td>
<td>0.469</td>
<td>3.149^</td>
</tr>
<tr>
<td>AAQ</td>
<td>14.297***</td>
<td>0.262</td>
<td>13.289***</td>
<td>24.248***</td>
</tr>
<tr>
<td>Induction type</td>
<td>0.487</td>
<td>2.434</td>
<td>1.772</td>
<td>1.470</td>
</tr>
<tr>
<td>Confederate ER</td>
<td>0.338</td>
<td>2.395</td>
<td>0.012</td>
<td>2.340</td>
</tr>
<tr>
<td>Induction type *</td>
<td>1.125</td>
<td>3.319</td>
<td>0.855</td>
<td>0.772</td>
</tr>
<tr>
<td>Confederate ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ * induction type</td>
<td>1.548</td>
<td>1.905</td>
<td>3.672</td>
<td>1.840</td>
</tr>
<tr>
<td>AAQ * Confederate ER</td>
<td>0.000</td>
<td>2.439</td>
<td>0.141</td>
<td>1.517</td>
</tr>
<tr>
<td>AAQ * induction type *</td>
<td>0.345</td>
<td>3.281</td>
<td>0.705</td>
<td>0.000</td>
</tr>
<tr>
<td>Confederate ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^ < .1, * < .05, ** < .01, *** < .001

Table 5: Habitual acceptance predicting post-video ER use and affect (Wald’s χ²)
Chapter 4: Discussion

The findings from this thesis suggest that interpersonal use of worry and acceptance may indeed have contagious properties; however, these effects might be different for the use of ER strategies and affective outcomes. When examining the use of worry during the videos, I found a main effect of confederate ER strategy, such that, across blocks (worry and acceptance), participants who interacted with the worrying confederate reported greater worry than those who interacted with the accepting confederate. There were no differences in use of acceptance. When predicting anxiety and disgust, I found an interaction between interaction type and confederate ER, such that in the acceptance block, participants reported greater anxiety and disgust when they interacted with the worry confederate as compared to the accepting confederate, but there were no effects in the worry block. Thus, confederate worry and acceptance may influence the use of worry regardless of ER induction, but might influence affect only when participants received the acceptance induction.

Several possibilities might account for why participants may have experienced contagion effects of confederate worry and acceptance on the ER outcome of worry. During these interactions, participants might have experienced a motivation to use the other person as a gauge for their behavior and/or read the other’s behavior as a “safety signal” (e.g., Blascovich et al., 1999). This process has been termed “social appraisal”, in which we judge another person’s responses to a situation in order to determine if our
response was appropriate and adapt accordingly (e.g., Parkinson, 2011). In this manner, when participants interacted with a worrying confederate, it may have signaled that there was danger and that they should respond similarly by worrying. By the same token, when participants interacted with an accepting confederate, it may have signaled greater safety and encouraged decreased worry.

A second, non-mutually exclusive possibility is that contagion effects might have occurred instead through the mimicry of facial expressions and body postures of the confederate (Hatfield, Cacioppo, & Rapson, 1994). Such effects could be explained via the facial feedback hypothesis (e.g., Strack, Martin, & Stepper, 1988), whereby participants might have unconsciously mimicked the expression of the worrying confederate, resulting in subsequent use of worry and negative affect, but the accepting confederate may not have provided the same degree of facial feedback, resulting in less use of worry. Future studies could utilize coders to determine the degree to which different ER strategies are associated with patterns of facial expressions and body posture. Similarly, studies using facial electromyography could also help investigators estimate the degree of concordance.

Differentiating between whether the mechanism of contagion in this thesis was through linguistic content or facial/bodily mimicry was not possible as the participants were able to see and communicate with the confederate via webcam. However, future studies may be able to further differentiate the two mechanisms by isolating the way interpersonal content is delivered. For example, investigators could ask participants to interact with each other with digital media that does not have face-to-face contact (e.g., online chat, texting, email). In this regard, a recent study showed that college students
only conduct 30% of their social sharing through face-to-face interactions (Choi & Toma, 2014). As such, digital media may be constitute a very ecologically valid approach to determining whether contagion effects are driven by linguistic processes, mimicry, or both.

Although participants who interacted with the accepting confederate reported lower use of worry compared to those who interacted with a worrying confederate, confederate strategy had no effect on actual use of acceptance. In other words, regardless of ER induction, participants who interacted with an accepting confederate were able to maintain lower levels of worry and participants who interacted with a worrying confederate maintained high levels, but this did not extend to the use of acceptance. This suggests that contagion effects may be stronger in modifying use of maladaptive ER strategies than adaptive ER strategies.

When examining affective outcomes, I found significant differences during the acceptance block, such that, those participants who interacted with the worrying confederate reported greater anxiety and disgust than those who interacted with the accepting confederate. This suggests contagion effects of worry in that those who interacted with the worrying confederate had higher negative affect, even if they had been induced to accept. There were no differences in affect between confederate ER groups when participants received the worry induction. This suggests that acceptance failed to “undo” the emotional effects of worry when participants were induced to worry resulting in similar levels of negative affect as those who interacted with the worry confederate.

The discrepancy between patterns of contagion from ER in 1) ER strategy and 2) affective outcomes is interesting and requires investigation. One possibility is that
participants may need a more powerful acceptance interaction in order to experience
effects on future adaptive ER strategy use. This idea is consistent with meta-analytic
findings suggesting that the relationship between adaptive strategies and
psychopathology has a smaller effect size than maladaptive strategies (Aldao, Jazaieri,
Goldin, & Gross, 2014; Aldao et al., 2010). In other words, it might take a bigger “dose”
of acceptance to undo the effects of one “dose” of worry.

Another possibility is that this asymmetry might have occurred as a result of
interpersonal characteristics. Participants might have been susceptible to social
conformity (e.g., Cialdini & Trost, 1998), such that when interacting with a worrying or
accepting confederate, they felt more pressure to conform to the other person’s behavior,
thus resulting in the surface level changes of greater worry for those who interacted with
the worrying confederate and less worry for those who interacted with the accepting
confederate. This may not have resulted in affective changes. Those who were induced to
worry may have reported less use of worry following the confederate acceptance
interaction, however, they may not have actually experienced affective changes if they
were mimicking only surface-level attributes of their partner (e.g., worry or non-worry).

Interestingly, the individual differences analyses suggest that high habitual
worriers may be more susceptible to the contagion effects of worry than low habitual
worriers. I found that for low habitual worriers, the experimental manipulations did not
create significant differences among participants when predicting the subsequent use of
worry; however, for those with chronic worry, I observed an interaction between
induction type and ER strategy, such that during the acceptance block (but not the worry
block), participants who interacted with the worrying confederate reported greater worry
during the video than those who interacted with the accepting confederate. This suggests that for those who have low chronic worry, the type of person one interacts with does not particularly influence the choice of future ER strategies. Those with worry as a more consistently used strategy in their repertoire, however, are more influenced by interacting with another worrying person.

Meta-analytic work may provide an explanation for this finding, as individuals with GAD, of which worry is a central feature, have an attentional bias towards threatening stimuli, such that they identify threats more readily (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007). Further, an experimental paradigm of attention modification suggests that induced attentional bias to engagement with threat results in increases in worry (Hirsch et al., 2011). Indeed, current theories of those with pathological levels of worry (e.g., GAD) respond faster to and identify more threats in their environment than those without pathological levels (e.g., Borkovec et al., 2004). The current finding may support this theory. It is possible that these high worry individuals may be more vulnerable to the contagion effects of worry because they are more vigilant to cues that may signal danger (i.e., another person’s use of worry). They also may be more attuned to the facial expressions of another person, as research suggests that those high in anxiety recognize fear better than those low in anxiety (Surcinelli, Codispoti, Montebarocci, Rossi, & Baldaro, 2006). Thus, these high habitual worriers may have greater vigilance to cues and more accuracy in identifying expressions that signal danger, which prompt greater subsequent use of worry.

The findings from this study also help to enrich our understanding of the relationships between interpersonal ER and mental health outcomes. Both co-rumination
and co-worry have been linked to increased symptoms of depression and anxiety (e.g., Dombrowski, 2014; Rose, 2002; Rose et al., 2007). Furthermore, rumination may spread through the intrapersonal adoption of the strategy by another (e.g., Haeffel & Hames, 2014; Stone & Gibb, 2015). Understanding interpersonal ER is critical towards improving mental health outcomes, as difficulties in interpersonal relationships are observed in disorders such as depression (Hames, Hagan, & Joiner, 2013), anxiety disorders (Rappaport, S, & D’Antono, 2014), obsessive-compulsive disorder (Rappaport et al., 2014), and eating disorders (Arcelus, Haslam, Farrow, & Meyer, 2013). Further, interpersonal difficulties and problems with interpersonal ER have been theorized to contribute to the development and maintenance of symptoms of anxiety (e.g., Hofmann, 2014) and depression (e.g., Marroquín, 2011). Individuals who are ineffective or inappropriately use interpersonal ER may experience difficulties in managing their symptoms or experience exacerbations. My findings suggest that those high in habitual worry, which may serve as a proxy for symptoms of GAD, are more vulnerable to contagion effects. It is possible that those who experience greater difficulties in ER may be more vulnerable to the effects of maladaptive strategies used interpersonally, more likely to adopt such strategies, more likely to experience negative affect, and subsequently experience increased intensification of symptoms of psychopathology or maintenance of current symptoms. As such, it is critical to learn more about other patterns of interpersonal ER across different forms of psychopathology.

Given the differential effects on the use of ER strategies and on affective experience, it becomes important for future studies to assess the consequences on contagion effects on downstream processes of emotion processing such as physiology
and behavioral response. For example, there is a vast literature showing that worry leads to increases in physiological reactivity and decreases in physiological flexibility (i.e., heart rate variability; Borkovec et al., 2004) and a growing literature suggesting that acceptance is associated with greater physiological flexibility (e.g., Aldao & Mennin, 2012). On an interpersonal level, there is also work suggesting that social support can reduce physiological reactivity (Thorsteinsson & James, 1999; Willemen, Goossens, Koot, & Schuengel, 2008), and that the use of suppression during a conversation leads to increase in partner’s physiological reactivity (Butler et al., 2003).

Equally important is the examination of behavioral outcomes of interpersonal ER (e.g., Aldao & Christensen, 2015; Christensen & Aldao, 2015). Dysregulated behaviors (e.g., aggression, overeating, substance use) are of particular interest given that they form the core of many mental health conditions (e.g., alcohol and substance use disorders, eating disorders, borderline personality disorder; American Psychiatric Association, 2013), yet comparatively little is known about social facilitation of such behaviors. For example, recent studies suggest that people tend to eat more in groups than alone (see review in Herman, 2015); however, much remains to be understood about the role interpersonal ER may play in the implementation of dysregulated behaviors. Future studies may examine how the use of different strategies interpersonally increases or reduces the likelihood of engaging in dysregulated behaviors.

Limitations

This thesis had several limitations that ought to be addressed in future research. First, the sample consisted only of female, undergraduate students. I restricted this sample to remove the confounding effects of gender, due to the noted differences in
patterns of co-rumination observed among women as compared to men (e.g., Rose, 2002; Rose et al., 2007), so it is unclear if the same relations observed in this sample would hold for males. Future research should examine if similar patterns of emotion and ER transmission are also present across both genders. For instance, it has been suggested that women may experience more emotion contagion compared men (e.g., Hatfield et al., 1994); however, these findings may be limited (e.g., Wild, Erb, & Bartels, 2001). For example, in one study, researchers found that women showed greater imitative responses and verbally reported emotional contagion than men to happy vs. angry faces, but not to happy vs. sad faces (Sonnby-Borgström, Jönsson, & Svensson, 2008). In regards to gender differences in interpersonal ER, in a study examining co-worry, men who reported higher levels of co-worry reported lower symptoms of depression and anxiety, while women reported higher levels of symptoms. Taken together, these findings suggest the importance of examining gender as a moderator.

The use of undergraduate students also restricted the variability among individual differences in maladaptive ER. As such, the analyses may have lacked the power to detect how these differences interacted with the experimental manipulation to predict outcomes. Future studies may seek to examine the effects of the experimental manipulation in clinical samples that are associated with increased bids for external ER sources. This could include disorders with noted increased reassurance-seeking behaviors, such GAD (Beesdo-Baum et al., 2012), depression (Starr & Davila, 2008), and obsessive-compulsive disorder (Parrish & Radomsky, 2011).

Finally, this study utilized only disgust-eliciting film clips. I focused on the emotion of disgust because it been frequently studied in the context of interpersonal
situations, as it has been theorized to help solidify in-group bonds in response to violation of group norms (c.f. Peters, Kashima, & Clark, 2009). Furthermore, people are significantly more likely to share disgust content than happy content (Peters et al., 2009). Future studies may expand beyond the regulation of disgust to the regulation of other emotions, such as fear or sadness. It may also expand type of regulatory partner to include friends, parents, or romantic partners to assess if contagion effects differ according to type of dyadic relationship.

Conclusion

The present study provides an important conceptual step forward for our understanding of contagion effects of the interpersonal use of ER strategies by consisting of an experimental manipulation of intrapersonal and interpersonal ER. The findings speak to an asymmetry in outcomes with more prominent effects occurring on use of worry and affect. Furthermore, it suggests that the contagion effects are stronger in influencing future use of a maladaptive strategy (worry) than an adaptive strategy (acceptance). Future research may expand upon this study by examining other forms of interpersonal ER, altering the medium through with the interpersonal interaction is delivered, and assessing these relationships in clinical populations. This line of inquiry has important potential implications for improving our interventions for those with difficulties with ER and helping to facilitate more effective use of social support.
References


39


Appendix A: Fast Friends Prompts

1. If you were able to live to the age of 90 and retain either the mind or body of a 30-year-old for the last 60 years of your life, which would you want?

2. Your house, containing everything you own, catches fire. After saving your loved ones and pets, you have time to safely make a final dash to save any one item. What would it be? Why?

3. What do you value most in a friendship?

4. For what in your life do you feel most grateful?

5. If you could wake up tomorrow having gained any one quality or ability, what would it be?
Appendix B: Emotion Regulation Induction Transcripts

Worry Induction

Before you watch the video again, we will ask you to try your best to focus your attention on each of the ideas you will be listening to over the next few minutes.

Listen to each item carefully. As you do so, use your imagination and concentration to focus your mind on each of the ideas. We will ask you to think about these ideas, focusing on the feelings that you are having. Spend a few moments visualizing and concentrating on each item. Please continue until the computer tells you it is time to move on to the next part of the study. [15 seconds per prompt, 3 minutes]

1. Think About:

   How nauseated you will feel when you watch the rest of the video

2. Think About:

   How much you will dread watching the video

3. Think About:

   How difficult it will be for you to eat after the study is over

4. Think About:

   The disgusting content of the videos

5. Think About:
How provocative you find these videos

6. Think About:

How you might have nightmares

7. Think About:

How physically sick the video will make you feel

8. Think About:

The degree of helplessness you feel

9. Think About:

Yourself having to eat the disgusting things in the video

10. Think About:

What will happen if you lose control over feelings of disgust and nausea

11. Think About:

Your stomach churning from disgust

12. Think About:

How you will feel bad for hours after the experiment

Acceptance Induction

Before you watch the video again, we will ask you to try your best to focus your attention on each of the ideas you will be listening to over the next few minutes.

Listen to each item carefully. As you do so, use your imagination and concentration to focus your mind on each of the ideas. We will ask you to think about these ideas and accept them, without using any judgment, focusing that the feelings that you are having are temporary and will soon pass once the study is over. Spend a few
moments visualizing and concentrating on each item. Please continue until the computer tells you it is time to move on to the next part of the study.

1. Think About:
   Your physical sensations will soon pass

2. Think About:
   Your feelings as an echo, loud at first, then fading out

3. Think About:
   Not letting yourself get carried away by your emotions

4. Think About:
   How you are capable of observing without reacting

5. Think about:
   Your feelings as a breeze that comes and goes

6. Think About:
   Your anxious feelings melting away like snow in the springtime

7. Think About:
   Your emotional thoughts coming and going

8. Think About:
   How your thoughts right now don’t have to define your experience

9. Think About:
   Yourself as a beach and your feelings as the tides coming and going

10. Think About:
    The nausea you might feel is temporary
11. Think About:

Your feelings as a firework that is intense but quickly over

12. Think About:

Each of your emotions as a comet, passing through the night sky and out of view