Inside and Out: Intrapersonal and Interpersonal Emotion Regulation in Young-Adult Friendships

Samantha Ann Chesney
Marquette University

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EMOTION REGULATION IN YOUNG-ADULT FRIENDSHIPS

by

Samantha A. Chesney, M.S.

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ABSTRACT
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To date, the field of emotion regulation has been held captive by inquiries into processes that unfold at an intrapersonal, or individual, level. As such, experts know a great deal about how individual choices to engage in a particular regulatory strategy are related to psychosocial outcomes. Recently the spotlight for theoretical and empirical attention has shifted to address an inarguable truth: humans are social beings. Research must break from the view of emotion regulation as intrapersonal *or* interpersonal, instead employing person-centered approaches that represent both levels as an interdependent system. The current study evaluated emotion regulation as a dynamic system to explore the complex regulatory processes in young-adult friendships.

Pairs of female friends were recruited to model the bidirectional relationships between trait-level intra- and interpersonal regulation. Results of a latent profile analysis categorized participants as having one of four, intrapersonal emotion regulation profiles: *Adaptive regulators, Accepting regulators, High Regulators,* and *Maladaptive regulators*. These trait profiles were entered into a series of Actor-Partner Interdependence Models predicting participants' use of trait interpersonal regulation. Findings showed that the intrapersonal regulatory profiles were not associated with one's own, or a friend's, use of interpersonal strategies.

The friendship dyads also engaged in conversations about positive and negative shared experiences, and state-level regulatory processes were explored. Analyses indicated that participants believed their effect on regulating a friend's emotion was diminished in negative, as compared to positive, emotional contexts. Still, self-assessments confirmed that interpersonal regulation reliably influenced state affect. In particular, the strategy of enhancing positive affect was related to emotionality, regardless of the conversation valence. This interpersonal strategy was the only one that was also implicated in how participants felt about the overall quality of their friendship; stronger friendships were observed in those who more often used up-regulation of positive affect.

Thus, the current findings confirm that interpersonal regulation directed at up-regulating positive affect holds significance for how individuals feel during emotionally-charged conversations, as well as the quality they ascribe to their friendship. This is distinct from interpersonal regulation aimed at down-regulating negative affect, which appears to be less related to state affect and friendship quality.

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INTRODUCTION

Emotions—and the regulation of them—are both deeply personal and inescapably social. Effective emotional management is not a product solely of self-regulation, but instead results from the ability to integrate moments of intrapersonal and interpersonal regulation. Thus, a break from the binary lens of evaluating emotion regulation at either the individual *or* the social level is overdue. If the field of affective science were to employ integrated analyses that account for these two interdependent systems, research could address the inherent duality of a person's attempts to regulate their emotional state during meaningful social experiences. The current study takes a dynamic systems approach to the conceptualization of emotion regulation and examines how emotionally-charged events unfold at both the individual—*intrapersonal*—and at the social—*interpersonal*—level.

Beginning at the intrapersonal level, the field of emotion regulation established a foundation for how lone regulatory strategies tend to influence a person's psychosocial well-being. For example, a substantial amount of literature indicates that suppressing the expression of emotion is generally ill-advised (Butler et al., 2003; John & Gross, 2004). However, the prevailing tradition of assessing only one strategy outside of the context of other regulation methods and inherent social regulatory processes is likely producing inchoate conclusions. Fortunately, recent studies have encouraged the evolution of assessments and analyses, such as "profiles" of emotion regulation that represent multi-strategy classifications of typical intrapersonal regulation (Chesney & Gordon, 2016; De France & Hollenstein, 2017; Dixon-Gordon, Aldao, & De Los Reyes, 2015). Additionally, growing attention has been put towards developing models of interpersonal

regulatory processes (Coté, 2005; Niven, Totterdell, & Holman, 2009; Zaki & Williams, 2013), as well as novel attempts at the empirical application of these models. However, the adult emotion regulation literature continues to lag in the depth with which it understands the labyrinth that persons navigate to regulate their emotional experiences. In particular, many studies neglect that an overwhelming majority of the human emotional experience occurs within a social context (Gross, Richards, & John, 2006). Given the duality of emotion regulation as inherently individual *and* social, the present investigation joins these two domains to present a unified investigation of regulatory proceedings during emotional events.

Emotions as the Pilot of the Human Condition

Emotions can function as a guide for individuals to navigate their lives, and—as such—they provide the potential for unparalleled growth. How people feel tells them whether the surrounding environment is supporting and benefitting them, or rather if it is working against them in some way. In response, individuals may act and react appropriately to improve their relational place in the world (Greenberg, 2015; Lazarus, 1991). The intimate coupling of this response to internal affective states is made evidently clear by findings that connect significant impairments in one's abilities to problem solve and make decisions with emotional desensitization due to brain damage. Damasio (1994) reported on a man who evidenced no intellectual impairments, and yet made the decision to drive to a needless appointment during a snowstorm, down icy roads and perilous conditions. He was the only patient who chose to attend his appointment that day; he was the only one without fear of the danger that his decision had put him in. It appeared that he could no longer respond to his "gut feelings" that may have directed

him to an alternative, safer choice. Further, when attempting to reschedule his appointment, he was nearly unable to choose between a pair of dates. His emotional systems were no longer able to direct his decision making toward a preferred option.

In addition to intrapersonal, self-serving functions, emotions also have interpersonal-level significance for adult relationships. Social scientists have proposed that the primary function of emotion is to serve as relational, dynamic evolutionary adaptations—or solutions—to the ubiquitous social problems that humans face as social beings (Keltner & Kring, 1998). In this view, emotion allows individuals to find preferred relational conditions, in turn presenting social benefits. Evidence for this is observed in at least three key ways. First, internal emotion states and dispositions are communicated and displayed in ways that are universally and automatically interpreted by others (Ekman, 1993). They may indicate the status of the ongoing relationship, such as whether it is characterized by dominance, and social intentions, such as intent to harm or comfort (Fridlund, 1992; Keltner & Kring, 1998). Second, findings on the interpersonal dynamics of emotion have indicated how one's emotional expression can evoke innate, complementary emotional responses in others, resulting in coordinated change in social relations (Dimberg & Öhman, 1996; Hatfield, Cacioppo, & Rapson, 1993; Keltner & Kring, 1998). A third social consequence of emotion is that it has the power to influence others' behavior. Indeed, research indicates that the anticipation of a particular emotional response from another can serve to increase or decrease a specific social behavior. For example, some theorists assert that laughter at the end of a verbal expression serves as a positive reinforcement for the social interaction that immediately precedes it (Bachorowski, Smoski, & Owren, 2001).

Thus, it is inarguable that our internal affective states guide our social selves and hold the power to improve our social relations while also promoting individual growth. Naturally, there is a large degree of variability in the emotion-demanding social situations that a person may encounter in a day—interacting with any number of different people, in any number of different roles, that each require a particular emotional interaction for "success". While our abilities to respond emotionally to our environment are essential for growth, emotions certainly, "are neither simple nor infallible guides, and they are not providers of pure bliss" (Greenberg, 2015; pg. 17). This is particularly true for individuals who tend toward misguided emotionality, such as those who believe emotions are something to be feared, avoided, or dismissed. Thus, it naturally follows that the field has been curious about the social outcomes associated with how people differentially manage their emotionality. Research and theory have invested in a better understanding of what differentiates those who emotionally prosper from those who emotionally perish. Emotional intelligence attempts to be a factor that encompasses multiple aspects of how our emotion-related awareness and abilities can inform our actions for better or for worse. Mayer & Salovey (1997) propose that a major component of the overall adaptability of an emotional response is emotion management, which refers to the ability to regulate emotions to suit one's needs. As such, the current project focuses on how processes of emotion regulation present a fundamental fork at which individuals diverge down a road of living an adaptive or maladaptive emotional life.

Intrapersonal Emotion Regulation

To date, the field of affective science has been primarily concerned with the ways people regulate themselves on an individual level. Separate from social regulatory

processes, regulation within an individual—or *intrapersonal* emotion regulation—refers to the ways in which people internally manage, experience, and express their affective states (Gross, 1998b). Regardless of whether the strategies used to achieve emotional goals are conscious or unconscious, the result is an influence on one's internal emotional state and/or environmental situation (Campbell-Sills & Barlow, 2007). As such, intrapersonal regulatory processes consider how an isolated individual could attempt to modify the type, magnitude, and expression of an emotional experience (Gross, 1998b). Fundamentally speaking, however, humans do not enact regulatory processes in isolation; we are naturally social beings whose regulation occurs in social environments up to 98% of the time (Gross et al., 2006). The literature attending to this offers promising indications that the specific regulatory strategies used by individuals can significantly affect social relationships.

For example, acceptance—one's ability to non-judgmentally experience an emotion, thus minimizing unnecessary attempts to defend against the emotion (Hayes, 1994)—has been shown to reduce an individual's subjective distress after an emotionally-charged experience (Campbell-Sills, Barlow, Brown, & Hofmann, 2006). This illustrates the benefit of employing this strategy after distressing interpersonal circumstances. Cognitive reappraisal, which refers to the process of altering our perceptions of a situation to subsequently change our emotional experience (Gross, 1998a), is commonly associated with better social outcomes than use of expressive suppression, defined as withholding behavioral expressions of affect so as to manage an emotional experience. Specifically, use of cognitive reappraisal to manage emotion, instead of suppressing emotional expression, is related to higher rapport in relationships,

higher perceived social support, higher peer-rated likability, and decreased negative perceptions of interpersonal interactions (Butler et al., 2003; Gross & John, 2003). This may be due in part from suppression stunting the social communication functions of emotion by creating incongruence between internal state and external expression (Rogers, 1951). Detectable by social partners, this dissonance reduces social connectivity, impairs relationship quality (Gross & John, 2003), and also results in poorer memory for conversations and emotional reactions during social interactions (Richards, Butler, & Gross, 2003).

While studies establish that intrapersonal emotion regulation is a critical element in determining social outcomes, additional research confirms that no one regulatory strategy can invariably guarantee a successful interpersonal exchange. There is a theoretical and an empirical consensus that individuals generally rely on multiple regulatory strategies to manage a given emotional response (Brans, Koval, Verduyn, Lim, & Kuppens, 2013), and the outcome of a regulatory action depends on the dependent interplay among the many employed strategies. Therefore, it is shortsighted to continue to identify individual strategies as "good" or "bad". Primary support for this comes from the research that indicates the effectiveness of adaptive strategies (i.e., those which ameliorate negative emotions) is intertwined with the use (or non-use) of maladaptive strategies (i.e., those which increase distressing emotions; Aldao, Jazaieri, Goldin, & Gross, 2014; Aldao & Nolen-Hoeksema, 2012b).

Two competing hypotheses have been proposed to explain the relationship between adaptive and maladaptive strategies: the *compensatory hypothesis* and the *interference hypothesis* (Aldao & Nolen-Hoeksema, 2012b). The interference hypothesis

asserts that employment of maladaptive strategies monopolizes regulatory resources (i.e., attentional focus) and interferes with the benefits of adaptive strategies. Alternatively, a compensatory relationship between adaptive and maladaptive strategies would indicate that adaptive methods are most ameliorative when maladaptive methods are also being used, since the negative effects of the maladaptive strategies are dampened by more adaptive approaches.

Currently, the compensatory hypothesis holds promising support from the literature. A cross-sectional study of community participants found that adaptive strategy use was associated with lesser symptom severity *only* when engagement in maladaptive avoidance strategies was *high* (Aldao & Nolen-Hoeksema, 2012b). Additional support for this hypothesis was found in a clinical treatment study of individuals diagnosed with social anxiety disorder, which found that adaptive strategies were generally more effective at managing emotional symptoms when participants used relatively equal levels of maladaptive strategies (Aldao et al., 2014). One interpretation of these findings is that individuals who tend to regulate by using a variety of strategies are engaging in regulatory flexibility, which is understood as one's ability to identify the needs of an emotional situation and flexibly transition between regulation strategies to employ the most adaptive process. Some experts argue that this approach most effectively serves one's emotion management needs, as intrapersonal regulatory flexibility is commonly associated with psychosocial health and adjustment, especially during episodes of emotional distress (Bonanno & Burton, 2013; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004).

Since an individual has a flexible repertoire from which to choose any number of regulatory strategies, a natural next step is understanding how the course of regulation is multiply determined by those strategies which are—and those which are not—put into action. Studies have improved their assessments by mapping the diversity of emotion regulation as a compound *profile*. Profiles of emotion regulation characterize a person's trait-level approach to intrapersonal regulation across assorted regulatory strategies. One investigation of emotion regulation profiles in a community sample (Chesney & Gordon, 2016) identified four distinct regulatory profiles: *Adaptive Regulation, Active Regulation, Detached Regulation,* and *Maladaptive Regulation*. The Adaptive and Maladaptive profiles were labeled according to their disproportionate reliance on strategies that typically result in desired psychosocial outcomes (i.e., acceptance, cognitive reappraisal, and problem solving) or undesired psychosocial outcomes (i.e., avoidance, expressive suppression, and rumination), respectively. These two profiles are arguably the most stable across samples. An extension of this work demonstrated that distinct groups of undergraduates could also be identified as having adaptive or maladaptive approaches to emotion regulation (Chesney, Timmer-Murillo, & Gordon, under review). The presence of adaptive and/or maladaptive profiles is likewise in work by other research groups analyzing repertoires of varying numbers and types of regulatory strategies (De France & Hollenstein, 2017; Dixon-Gordon, Aldao, et al., 2015; Eftekhari, Zoellner, & Vigil, 2009). Perhaps the next most replicated are the High Regulator and Low Regulator profiles. Regardless of whether the profile analysis includes only two strategies (Eftekhari et al., 2009) or is much more inclusive with seven strategies (Dixon-Gordon,

Aldao, et al., 2015), it appears that there are observable groups of individuals who report very high or very low reliance on all measured regulatory methods.

Outcome studies underscore the value of emotion regulation profiles by showing that an individual's profile is systematically associated with reports of psychosocial problems. Indeed, individuals whose profiles are characterized by maladaptive strategy use are more likely to report symptoms of psychopathology (i.e., depression, anxiety, and posttraumatic stress) than those individuals whose profiles are characterized by high use of adaptive strategies (Chesney & Gordon, 2017; Dixon-Gordon, Aldao, et al., 2015; Eftekhari et al., 2009) or overall average use of all strategies (i.e., *Average* regulators; De France & Hollenstein, 2017). The outcomes associated with having a High Regulator or Low Regulator profile are yet unclear. While some studies indicate that frequent use of many strategies is related to elevated levels of psychological difficulties (Dixon-Gordon, Aldao, et al., 2015), other studies indicate that it is in fact low global regulation that is correlated with worse psychological health (Eftekhari et al., 2009). Still other studies find little-to-no differences between high regulators and average regulators (De France & Hollenstein, 2017). Despite the connections between individual regulatory strategies and interpersonal factors such as rapport and social support (Gross & John, 2003), investigators have not yet included social outcomes in their evaluations of regulatory profiles. More studies are needed to develop a reliable understanding of what a particular emotion regulation profile implies for psychological and social well-being.

Other contextual aspects of strategy use, such as the setting in which the regulation occurs and the individual with whom it is occurring, have also proven critical for differentiation of positive and negative outcomes (Aldao, 2013; Aldao & Nolen-

Hoeksema, 2012a; Doré, Silvers, & Ochsner, 2016). For example, intrapersonal emotion regulation profiles vary according to whether an individual is considering their approach to an emotionally-challenging scenario that is socially-related, achievement-related, or non-specific (Dixon-Gordon, Aldao, et al., 2015). While these results offer another example of how important it is to consider regulatory flexibility, they also allude to the importance of considering both intrapersonal and interpersonal aspects of emotion regulation. Regrettably, a review of the literature (Campos, Walle, Dahl, & Main, 2011) reported that less than 12% of studies published since 2001 have assessed emotion regulation in the physical or imagined presence of another person. This proportion is in stark contrast to figures estimating that regulation occurs in a social setting up to 98% of the time (Gross et al., 2006), which strongly suggest that emotional success results from flexibly invoking moments of both intrapersonal *and* interpersonal regulation. Integrating the inherent duality in these processes allows for an evolved concept of emotion. An example is seen in a study investigating the likelihood for engaging in anger-inducing activities, which indicated that preference for such activities was greater when the individual was anticipating social confrontation (Tamir, Mitchell, & Gross, 2008). A solely intrapersonal evaluation of an emotional context may lead to the ubiquitous avoidance of an unpleasant emotion such as anger. Integrating an interpersonal context allows the more nuanced conclusion that an appropriate level of anger is adaptive in confrontations, thus allowing for a richer understanding of the influences that give way to processes of emotion and emotion regulation.

Interpersonal Emotion Regulation (IER)

Processes of interpersonal emotion regulation (IER) choreograph an intricate dance that involves multiple actors and reactors, each with their own strengths and weaknesses, as well as their own needs and motivations. Not only is each person continually expressing and regulating their own emotions, they are balancing attempts to regulate their partner's emotional state as well. Although there is yet to be a universally-accepted set of characteristics that define IER, collective agreement is mounting that it involves a number of necessary, additive features that distinguish it from intrapersonal regulation. For example, IER often involves up-regulation of emotion, in addition to the down-regulation typically sought in intrapersonal regulation. Further, interpersonal interactions often necessitate the regulation of positive *and* negative affect, which stands in contrast to an individual typically focusing their internal regulation efforts on negative affect (Levenson, Haase, Bloch, Holley, & Seider, 2014). Recently, some experts have argued that IER can only occur in the live presence of another person (Zaki & Williams, 2013), and thus studies that ask an individual to imagine the presence of another may eventually be excluded from what is considered a valid assessment of IER.

Operationalizing IER also requires clear boundaries that distinguish it from an array of closely related concepts. For example, whereas IER refers to short-term processes that can acutely increase *or* decrease positive *or* negative affect, the related processes of coping and social support are typically longer-term processes meant to reduce general distress (Dixon-Gordon, Bernecker, & Christensen, 2015). Additionally, IER is defined as active processes that are enacted with the express intent to alter affect (Zaki & Williams, 2013). Therefore, these processes are distinct from indiscriminate

social interactions such as generic social support, which may or may not have the goal of emotional change (Dixon-Gordon, Bernecker, et al., 2015; Zaki & Williams, 2013), as well as stress buffering, where affective change may result from the passive presence of another person (Coan, Schaefer, & Davidson, 2006). The active, intentional nature of IER is also distinct from emotional contagion, an individuals' automatic inclination to mimic the verbal expressions and non-verbal movements of others to sync each other's emotionality (Hatfield et al., 1993). While IER can offer emotional synchrony and stability, it also encompasses up- or down-regulation intended to destabilize others. Thus, IER must also be distinguished from coregulation, which describes processes enacted to achieve optimal emotional stability for all persons (Butler & Randall, 2013).

Models of IER. Early models addressing social regulation primarily focused on communication during emotional exchanges (Coté, 2005; Kappas, 1991). One major contribution of these models was the understanding that dynamic feedback loops exist between partners, which would eventually go on to inform theoretical distinctions and dimensions of interpersonal regulation. Contemporary models conceptualizing IER according to our current understanding (Niven et al., 2009; Zaki & Williams, 2013) have only recently emerged. These representations of IER attempt to characterize the complex regulatory pathways that exist between two individuals who are experiencing and expressing emotion. A complete model of interpersonal regulation must arguably address the duality inherent in social regulation by incorporating the dynamic processes at both the intrapersonal and interpersonal level. The prevailing model meeting this requirement was recently proposed by Zaki and Williams (2013) and is continuing to gain support from experts in emotion regulation.

Zaki and Williams (2013) organize IER processes along two dimensions. The first dimension distinguishes a regulatory process according to whether it is intended for intrapersonal, or self, regulation of the individual (i.e., *intrinsic* regulation) or interpersonal regulation of another person (i.e., *extrinsic* regulation). The second dimension differentiates processes according to whether they are response-dependent or response-independent. Response-dependent processes involve a goal that depends on a prescribed response from the regulatory target. For example, an individual may experience up-regulation of positive affect after sharing feelings with another individual, but only if the other person responds supportively. On the other hand, response-independent processes do not require a particular response. For example, individuals might label and express their emotional state aloud, which could itself regulate their affect without any response from another person (Zaki & Williams, 2013). Therefore, this framework classifies all IER processes in one of four categories, depending on whether they are defined as intrinsic or extrinsic *and* response-dependent or response-independent.

It is worth pointing out that this and other models of IER focus almost entirely on trait-level regulation and fail to adequately address state-level processes. Expanding theoretical and empirical work to understand IER processes that are being employed in the moment during a regulatory episode may delineate how individual differences relate to emotional and social outcomes. For example, previous research shows how differences in interpretation can lead one individual to feel positive about their situation while another feels invalidated, thereby experiencing an increase in negative affect (Dixon-Gordon, Bernecker, et al., 2015). Thus, although studies have begun to touch on

related mechanisms for how state-level interpersonal processes may alter affect, future analyses at the state-level may offer unique insights as to how social regulation may be successful—and perhaps the even larger number of ways in which it could fail. For example, in a given context and for a given person, is it most effective for that person to focus their regulatory energy on themselves, on another person(s), or on the relationship between these dynamics? Regrettably, insight in this area is critically limited by the lack of appropriate instruments currently available to assess IER strategies and processes.

Measurement and Outcomes of IER. Historically, assessments that were originally designed to measure related constructs, such as communication and attachment, have been borrowed by those interested in assessing IER. For example, the *Managing Affect and Differences Scale* (MADS; Arellano & Markman, 1995), a measure of communication strategies during conflict, has been used to measure IER-relevant processes such as up- and down-regulation of a partner's affect. As this measure was initially designed to assess communication style, it only captures a limited portion of the dynamic features of interpersonal regulation and is not well-aligned with contemporary IER models. Still, this and other highly-related work substantiates that interpersonal regulatory processes have considerable implications for psychosocial wellness, including depression and anxiety (for reviews, see: Hofmann, 2014; Keltner & Kring, 1998; Marroquín, 2011). Research by Lopes and colleagues (2005) demonstrated that global IER abilities, as measured by the Mayer-Salovey-Caruso Emotional Intelligence Test (Mayer, 2002), were associated with reciprocal friendship nominations. Via self- and other-reports, these authors also indicated relationships between effective IER and ratings of interpersonal sensitivity and prosocial tendencies. Specific components of IER,

including emotional awareness, situation evaluation, and strategic regulatory responding, have negative relationships to relationship conflict—a finding that appears to be even stronger than the relation of IER to positive dimensions of relationship quality (e.g., support, companionship, and nurturance; Lopes et al., 2011). As such, it appears that being able to effectively regulate one's own emotions, as well as engage in interpersonal regulation, influences social connectivity and one's ability to resolve interpersonal conflict.

Currently, only two measures have been explicitly validated for the measurement of IER processes. The first to be published was the *Emotion Regulation of Others and Self* scale (EROS; Niven, Totterdell, Stride, & Holman, 2011), which assesses how often an individual uses intrapersonal regulation to manage their own emotion and interpersonal regulation to manage the emotion of others. Along each of these dimensions, this measure also assesses for regulatory actions that are intended to improve affect and worsen affect. Thus, regulation is measured according to four subscales: intrapersonal affect-improving (i.e., deliberately improving one's own affect); intrapersonal affect-worsening (i.e., deliberately worsening one's own affect), interpersonal affect-improving (i.e., deliberately improving another's affect); and interpersonal affect-worsening (i.e., deliberately worsening another's affect). Unfortunately, the research supporting the scale construction of this measure is limited, as there is little theoretical and empirical foundation for the appropriateness of an affect-worsening dimension of IER. These items are rarely endorsed and may actually be measuring constructs closer to criticism and negative self-perception. Further, the affect-improving items have yet to demonstrate meaningful relationships with affect, and thus

the validity of the items in this domain are concerning as well (Hofmann, Carpenter, & Curtiss, 2016).

In response to these limitations, an alternative to the EROS has recently been published. Hofmann and colleagues (2016) developed the *Interpersonal Emotion Regulation Questionnaire* (IERQ) by taking an empirical, qualitative approach. Their method involved asking participants to respond to open-ended questions about interpersonal regulation to generate items and a resulting model of interpersonal regulation that is unlike previous models. Specifically, Hofmann and colleagues' theoretical and empirical conceptualization of IER focuses on a person's tendencies to regulate emotion by relying on others, without explicit intention to elicit that regulation. In effect, this creates an assessment of intrinsic IER, as established theoretically by Zaki and Williams (2013), measuring how much individuals turn to others to help them regulate their own emotionality. Unlike Zaki and William's model, however, the IERQ does not address extrinsic regulation (i.e., regulation of another person's emotionality). Additionally, it does not differentiate between response-dependent and response-independent regulation, but instead includes a combination of these dimensions in an attempt to comprehensively evaluate how a respondent utilizes others to regulate their own emotions (Hofmann et al., 2016).

The IERQ includes four domains of IER, including: 1) Enhancing Positive Affect, a tendency to be around others to increase happiness and positivity; 2) Perspective Taking, looking to others for reminders that things could be worse; 3) Soothing, relying on others for love and comfort; and 4) Social Modeling, leaning of and using others' strategies for managing an emotional situation. Therefore, this measure is able to assess

regulatory flexibility across multiple strategies that cover both positive and negative affect as well as up- and down-regulation. Unfortunately, published outcomes associated with these four strategies of IER is limited to only one study that reports on correlational relationships with demographics, psychological symptom reports, and self-report measures of emotion regulation (Hofmann et al., 2016). With regards to demographics, results indicated direct relationships between three of the IER strategies and age, but no relationship of any strategy to gender. Data on psychological symptom reports showed that each IER strategy except enhancing positive affect was directly correlated with symptom reports of depression and social anxiety. Also, use of soothing and social modeling strategies was directly related to symptoms of generalized trait anxiety. The authors also reported on the relationships of the four IER strategies to several measures of emotion regulation. Pairwise relationships between each of the IERQ subscales were all characterized by significant, positive correlations. Each IER strategy also directly correlated with the two interpersonal subscales of the EROS measure. Thus, it appears that individuals who use IER tend to use multiple strategies for interpersonal regulation. With regards to intrapersonal emotion regulation, the relationships are more nuanced. It seems that individuals who use the four IER strategies measured in the IERQ have more difficulties overall with intrapersonal regulation and generally tend to use more intrapersonal strategies. For example, this study reported positive correlations between the IER strategies and both intrapersonal subscales of the EROS, as well as reported use of cognitive reappraisal. However, the use of other intrapersonal strategies, such as expressive suppression, appears to be unrelated to use of these IER strategies (Hofmann et al., 2016). Therefore, additional research on the relationships between intrapersonal

and interpersonal strategies would be beneficial for understanding how regulation at these levels may be working together to manage emotion.

The Current Study

Since emotionality and emotion regulation serve multifaceted functions, current research must move beyond the intrapersonal-level analyses that have dominated the field to facilitate our understanding of regulation at the interpersonal-level as well. The current study piloted a novel IER paradigm to simultaneously assess intrapersonal and interpersonal factors of emotion regulation in young-adult, same-gender, female friendships. Given the importance of emotional flexibility (Bonanno & Burton, 2013), participants engaged in an in vivo conversation task that required a variety of regulatory abilities to effectively up-regulate and down-regulate varying affective states. Intrapersonal emotion regulation was assessed using a profiles approach that encompassed the use of six different regulatory strategies. IER was defined per the theoretical and empirical conceptualization put forth by Hofmann and colleagues (2016), as it is the most current and comprehensive to date. Following the theoretical model of Zaki and Williams (2013), interpersonal regulation was differentiated throughout as intrinsic (i.e., when a person uses someone else to regulate their own emotions) or extrinsic (i.e., when a person attempts to regulate someone else) regulation. Additional measures evaluating affect during the social task were taken, and friendship quality was assessed to evaluate the relationship between emotion regulation and participants' perceptions of their relationship strength. This study evaluated the following research questions:

Research question 1 – Trait-level intra- and interpersonal emotion

regulation. The first research aim presents a generalized, trait-level analysis. Critically, there is yet to be a parsimonious model of trait emotion regulation that accounts for both intrapersonal and interpersonal regulatory factors. The models analyzed herein addressed the need for improved conceptualization of the dynamics at play during social emotion regulation. Each was measured and tested using the Actor-Partner Interdependence Model (APIM; Cook & Kenny, 2005; Figure 1; see Data Analysis section for additional description) of dyadic relationships, which accounts for the interdependence between the two individuals in a friendship dyad (Kenny, Kashy, & Cook, 2006).

Four models were assessed (Figure 2), one evaluating each of the IERQ subscales, to estimate the degree to which trait-level intrapersonal emotion regulation influences trait-level use of an intrinsic IER strategy. All models accounted for multiple strategies of intrapersonal emotion regulation by classifying an individual according to their profile of emotion regulation. Trait intrinsic IER was assessed with the subscales of the IERQ (Hofmann et al., 2016). All models evaluated the following questions:

a. *Does an individual's intrapersonal emotion regulation profile influence how they use others to regulate emotion (i.e., engage in intrinsic IER)?* In the current models, this is called an *actor effect* because it evaluates the effect that occurs when one's score on a predictor variable (intrapersonal regulation) affects that same person's score on a given outcome (interpersonal regulation; Kenny et al., 2006). Previous literature indicates that the IER strategies of perspective taking, soothing, and social modeling are positively correlated with a variety of intrapersonal strategies, as well as global difficulties with emotion regulation

(Hofmann et al., 2016). Therefore, it was hypothesized that those participants with intrapersonal regulatory profiles characterized by use of many different strategies or by use of maladaptive strategies would endorse greater engagement in these three intrinsic IER strategies, as compared to those with profiles characterized by generally low intrapersonal regulation or by use of adaptive strategies. Alternatively, the limited findings on the IER strategy of enhancing positive affect show no predictable relationships with intrapersonal regulation and regulatory difficulties (Hofmann et al., 2016). Therefore, no hypothesis could be made regarding the relationship of this IER strategy to one's intrapersonal regulatory profile.

b. *Does an individual's intrapersonal emotion regulation profile influence the way that their friend uses others to regulate emotion?* In the current models, this is called a *partner effect* because it evaluates the effect that occurs when one's score on a predictor variable (intrapersonal regulation) affects their friend's score on a given outcome (interpersonal regulation; Kenny et al., 2006). No studies have yet investigated the associations between one person's regulation and the intrinsic IER of those interacting with that person. Therefore, whether one's individual regulation translates to their effectiveness in regulating others is purely speculative. However, given findings on intrapersonal regulatory profiles which indicate that those with maladaptive profiles demonstrate consistently poorer psychosocial health, it was hypothesized that a more maladaptive intrapersonal profile would predict decreased reliance on that individual for regulation (i.e., decreased use of intrinsic IER by a friend). Given the further uncertainty

introduced by whether adaptive strategies effectively ameliorate emotional difficulties when contextualized with maladaptive strategies (Aldao et al., 2014; Aldao & Nolen-Hoeksema, 2012b), no hypothesis could be made regarding the relationship between adaptive profiles and a friend's intrinsic IER.

Research question 2 – State-level intrinsic IER and affect. In contrast to the first aim, which evaluated trait-level regulatory processes, the remaining aims pertained to state-level IER and addressed important questions about regulation during a particular event. Specifically, the second aim addressed whether state intrinsic IER influences affect, effectively asking, *"Does relying on my friend to regulate help me manage my own emotions?"* In other words, does how I use my friend to regulate myself predict how I feel in the moment? Although no study has evaluated how these interpersonal strategies influence state affect, one study has indicated that use of perspective taking, soothing, and social modeling is directly related to trait symptoms of depression and use of soothing and social modeling is directly related to trait symptoms of anxiety (Hofmann et al., 2016). Given that these psychopathological symptoms tend to be related to state affect, even in non-clinical samples (Crawford & Henry, 2004), it was hypothesized that perceptions of increased interpersonal regulation by a friend would be related to higher self-rated negative, and lower self-rated positive affect.

Research question 3 – State-level IER and friendship quality. If dynamic regulatory processes have the power to influence state affect during an emotionally-charged interaction, and state instances may illustrate a pattern of behavior between individuals, then it is reasonable to believe that measures of state IER may also relate to overall quality of a friendship. Therefore, the third aim addressed whether the state IER

occurring during emotionally-charged conversations was indicative of overall perceived friendship quality (see Figure 3). This aim was split into two parts, based on the target of regulation (i.e., intrinsic or extrinsic IER).

    a. *Intrinsic IER: Does how I rely on my friend for emotion regulation relate to how I describe the quality of our friendship?* Essentially, do I feel good about this friendship because of how I use my friend to regulate myself? No studies have yet investigated how a particular instance of state intrinsic IER influences ratings of overall friendship quality. However, a trait-like tendency to rely more heavily on others to regulate your emotions is positively correlated with an anxious attachment style (i.e., a tendency to worry about being abandoned in close relationships; Hofmann et al., 2016). Therefore, it was hypothesized that greater use of a friend to regulate one's own emotionality (as measured in the emotional conversation task of this study) would be indicative of poorer perceived friendship quality.

    b. *Extrinsic IER: Does how my friend relies on me for emotion regulation relate to how I describe the quality of our friendship?* In other words, do I feel good about this friendship because of how my friend uses me to regulate herself? Although findings in the attachment domain indicate that an individual's perception of their relationship effectiveness is related to their use of other's IER (Hofmann et al., 2016), no studies have yet investigated the outcomes associated with an individual's extrinsic regulation of others. Still, it may be argued that believing your friend is relying on you to regulate could increase feelings of interpersonal closeness, thus influencing perceptions of your

relationship. Therefore, it was explored whether the degree to which a person perceives their friend's use of themselves to regulate was related to perceived friendship quality.

METHOD

Participants

A total of 98 participants (49 dyads) were recruited from the Marquette University Psychology Subject Pool, which advertises research opportunities to undergraduates currently enrolled at the university. All participants were required to self-identify a "close", same-gender friend to attend the laboratory session with them. Inclusion criteria included the following: 1) dyads have been friends for at least 4 months (to ensure they have had a sufficient amount of social interaction necessary to complete the laboratory task effectively); and 2) 18 years of age or older. One mixed-gender dyad was run in error, and therefore was excluded from all analyses. Another dyad indicated after participating that they did not understand study instructions, and therefore their responses were inapplicable; this dyad was also excluded. Finally, for the purposes of the current dissertation study, only female dyads were included in the following analyses. This was due to the potential for gender differences in emotion experience and expression (Niedenthal & Ric, 2017) and the low recruitment of males ($n = 10$; 5 dyads), making gender-based analyses inappropriate. The final analytic sample included 84 participants (42 dyads).

Mean age of participants was 18.86 years ($SD = 0.73$, range = 18-21). The racial distribution of the sample was as follows: 71.4% Caucasian/White, 10.7% Hispanic/Latino, 4.8% African American/Black, 4.8% Asian, and 8.3% other/mixed race. Most participants (94%) self-identified as heterosexual. All participants' marital status was single, and each participant reported that they have never been in a romantic relationship with the person with whom they participated. The length of time that dyad

members were friends prior to participating was strongly positively skewed; the median

friendship length was eight months (mean = 20.96; *SD* = 38.29; range = 5 – 228). All

study methods and procedures were approved by the institutional review board of

Marquette University, Milwaukee, Wisconsin.

Materials

Intrapersonal emotion regulation measures.

Acceptance. The Difficulties in Emotion Regulation Scale (DERS; Gratz &

Roemer, 2004) is a 36-item measure designed to assess a respondent's difficulties with

various components of emotion regulation. The 6-item Nonacceptance of Emotional

Responses subscale served as the measure of *Acceptance* strategies (Cronbach's α =

0.90) in the current study. Items on this subscale assessed one's ability to accept feeling

"upset," and not becoming angry, embarrassed, ashamed, or guilty for feeling that way.

Respondents were asked to report the extent to which they believe each item applies to

them using a scale ranging from 1 = *almost never, 0-10%* to 5 = *almost always, 91-100%*.

Cognitive reappraisal and expressive suppression. The Emotion Regulation

Questionnaire (ERQ; Gross & John, 2003) is a 10-item measure that asks participants to

respond to statements about aspects of their emotional life to assess ongoing, routine use

of cognitive reappraisal and expressive suppression. As measured by the items on these

subscales, *Cognitive Reappraisal* (Cronbach's α = 0.86) assesses behaviors such as

changing one's thought processes when wanting to feel more or less positive or negative

emotion. *Expressive Suppression* (Cronbach's α = 0.72) assesses behaviors such as

keeping one's emotions to oneself and being careful not to express either positive or

negative emotion (Gross & John, 2003). Each subscale was used to examine the respective strategy of emotion regulation.

   Avoidance and problem solving. A subset of the 48-items from the Coping Responses Inventory (CRI; Moos, 1993), which assesses both cognitive and behavioral strategies used in response to recent stressors, was administered to assess for *Avoidance* and *Problem Solving*. Following previous research on avoidance as a predictor of psychopathology (Chesney & Gordon, 2016; Holahan, Moos, Holahan, Brennan, & Schutte, 2005), the current study evaluated use of *Avoidance* strategies by summing the Cognitive Avoidance and Emotional Discharge subscales (Cronbach's α = 0.76 and 0.52, respectively). This composite index (Cronbach's α = 0.74) indicated how often a respondent has made cognitive attempts to avoid thinking about a stressor (e.g., tries not to think about the problem) and how often a respondent has made behavioral attempts to reduce distress through expression of negative feelings instead of dealing directly with a stressor (e.g., exhibits strong, emotional behaviors). The Problem Solving subscale (Cronbach's α = 0.72) of this measure was used to evaluate the use of *Problem Solving*. Items for this subscale detailed techniques such as making a plan (and following through), trying multiple ways to solve a problem, and understanding what has to be done before trying hard to resolve the issue.

   Rumination. A subset of the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski & Kraaij, 2006), an 18-item measure designed to understand how respondents cope with negative or unpleasant events, was administered to evaluate *Rumination* (subscale Cronbach's α = 0.72). Participants responded to items on a scale ranging from 1 = *(almost) never* to 5 = *(almost) always* to assess how often a respondent

is thinking about, being preoccupied with, and wanting to understand how he/she feels about his/her experiences.

Interpersonal emotion regulation (IER) measures.

Trait interpersonal emotion regulation. The 20-item Interpersonal Emotion Regulation Questionnaire (IERQ; Hofmann et al., 2016) assesses a respondent's trait tendencies to use other people to help them regulate their emotions. Items were developed and validated in non-clinical samples, and four subscales capture varying interpersonal regulatory processes. The *Enhancing Positive Affect* subscale (Cronbach's $\alpha = 0.89$) includes items such as *"Because happiness is contagious, I seek out other people when I'm happy."* The *Perspective Taking* subscale (Cronbach's $\alpha = 0.83$) measures items such as *"Having people remind me that others are worse off helps me when I'm upset."* The *Soothing* subscale (Cronbach's $\alpha = 0.88$) includes items such as *"I look to others for comfort when I feel upset."* The *Social Modeling* subscale (Cronbach's $\alpha = 0.91$) assesses items such as *"Hearing another person's thoughts on how to handle things helps me when I am worried."* Each subscale includes five unique items rated on a five-point Likert scale from 1 = *Not true at all for me* to 5 = *Extremely true for me*. Items were summed to create subscale scores (range 5 – 25) that indicate the extent to which that individual uses others to help them regulate their emotions in these four specific ways.

State interpersonal emotion regulation. Modeling the interpersonal regulatory domains measured by the IERQ (Hofmann et al., 2016), and recognizing the importance of measuring both intrinsic *and* extrinsic regulation as suggested by Zaki & Williams (2013), the eight-item Interpersonal Emotion Regulation – State questionnaire (IER-state;

Figure 4) was developed for the current study and intended to measure participants'

perception of the moment-to-moment IER occurring in each of the conversations. Each

participant responded on a five-point Likert scale to indicate their perception of state

regulation during the conversations from 1 = *Not true at all for me* to 5 = *Extremely true*

for me. Specifically, four items were used to assess how much their partner's

interpersonal regulation attempts affected their own emotional state, thus measuring state

intrinsic IER (range = 4 – 20). For example, enhancing positive affect was measured by

the item "*During this conversation, I enjoyed being around my friend because their*

positivity is contagious", and soothing was assessed by the item "*During this*

conversation, I turned to my friend for comfort and consolation." An additional four

items were used to assess how much a participant believed they were being relied upon to

influence their partner's emotional state, thus measuring state extrinsic IER (range = 4 –

20). Here, the item on enhancing positive affect stated, "*During this conversation, my*

friend enjoyed being around me because my positivity is contagious." Perspective taking

was measured by the item, "*During this conversation, my friend felt better because I let*

them know that there's no reason to worry, since their situation could be worse." All

items are presented verbatim in Figure 4.

State affect measures.

Affect Check-in – Paper Version. State positive and negative affect were

assessed during the Regulatory Task (see Procedure section) with an Affect Check-in

paper form that was created for the purposes of this study. The assessment presented six

visual analog scales, anchored at the ends by *Not at All* and *Very Much,* and asked

participants to "mark on the line how much you're feeling each of these emotions right

now." Each of the six lines was accompanied by an emotion: the positive feelings included happy, joyful, and emotionally connected, and the negative feelings included distressed, upset, and frustrated.

Affect Check-in – Electronic Version. State positive and negative affect were assessed during the Video Review (see Procedure section) with an electronic version of the Affect Check-in form. This version assessed the same six emotions as the paper version (happy, joyful, emotionally connected, distressed, upset, and frustrated), but did so in a Likert-style format (0 = *not at all*; 10 = *very much*) due to limitations of the electronic format. Participants provided state affect ratings for themselves (i.e., self-rated affect) and their friend (i.e., friend-rated affect) to report "how much each word reflected how [you were/your friend was] feeling during this segment."

Friendship quality measure. Friendship quality was assessed using the short form of the McGill Friendship Questionnaires–Friend's Functions (MFQ-FF; Mendelson & Aboud, 1999), which measures six friendship functions: stimulating companionship, help, intimacy, reliable alliance, self-validation, and emotional security. Respondents were instructed to indicate the degree to which they believe that these functions are met by the friend with whom they are participating. Likert scale responses for each item range from 1 = *never* to 8 = *always*, with higher scores indicating greater fulfillment of friendship functions by the friend. For the current study, items were averaged to create a mean score measuring overall friendship quality (Cronbach's α = 0.96).

Conversation topic prompts. Participants independently completed a form to identify potential conversation topics to discuss during the Regulatory Task (see Procedure section). Every individual provided a free-response to each of the following

prompts: 1) "Please identify 3 positive shared memories that you have with the friend with whom you are participating in this study. These should be memories that you could easily spend at least 5 minutes talking about with your friend." And 2) "Please identify 2 negative/stressful shared memories that you have with the friend with whom you are participating in this study. These should be conflicts that are still upsetting to you. Also, they should be things that you could talk about for at least 5 minutes with your friend."

Procedure

After meeting inclusion criteria, dyads attended one, 90-minute session together, for which they received partial course credit for their time. Advanced psychology undergraduate and graduate research assistants administered all measures and procedures. Each participant underwent an informed consent process, which included an overview of the study. Participants were told that they would first complete a series of self-report measures. Second, they would participate in a regulatory task where they would have a series of video-recorded conversations with their friend. Third, they would complete the study by reviewing the videos of their conversations while providing information about how they were feeling while talking with their friend. The regulatory task and video review are described in detail below.

Regulatory task. Next, each friendship dyad completed the regulatory task. Participants were introduced to the procedure, and then asked to sit across from one another, where each participant's face and upper body was in clear view of a video camera. This portion of the procedure consisted of three, five-minute conversations between the dyads about the shared experiences that they provided in the self-report measures. The first conversation was regarding a positive experience (i.e., Conversation

P$_1$), the second conversation was regarding a negative experience (i.e., Conversation N), and the final conversation was about a new positive experience that they had not yet discussed (i.e., Conversation P$_2$). Before and after each conversation, participants independently completed the paper version of the Affect Check-in form.

Participants began by discussing the story of how they met to become more comfortable and practice for the upcoming conversation tasks. No recordings or measurements were taken during this practice period, and the prompt was purposefully worded to parallel the instructions given for the conversations where measurements of affect and emotion regulation would be taken. The dyads were offered the following instructions to describe this portion of the task:

"To get us warmed up, why don't you two talk to each other a bit about how you met? You can walk through the events of the story, like you are retelling it to another friend who wasn't there. Talk to each other about what you were thinking and feeling throughout."

To set up the first conversation, Conversation P$_1$, the research assistant read aloud each of the dyad's positive shared experiences, and the dyad decided on their first positive conversation topic. The dyads were instructed that the memory they choose should be one that continues to make them feel good/happy/excited, and one that they believe they could get back into the moment of. The research assistant provided the following instruction to direct the dyad's conversation:

"Great! So now I'll give you five minutes where I leave the room and you talk about [topic]. Talk to one another as you normally would—don't feel like you need to be "professional", just talk like you were sitting on your couch at home.

Please try to fill the whole time by walking through the events of the story, like you are retelling it to another friend who wasn't there. Talk about what you were thinking and feeling at the time. Be sure to specifically explain to each other: what about this experience makes you happy? How did you know—what did you feel in your mind and your body? The idea is to get back into that memory as much as possible and re-experience the happiness that comes along with it. I'll come back in 5 minutes."

The research assistant then began the video recorder and exited the room for five minutes while the participants recounted their positive shared memory. Upon reentry, the research assistant stopped the video recorder and read to the participants each of the negative/conflictual topics that were provided at the first session. Participants were encouraged to choose one of the provided topics that is still distressing, and one that they could get back into the moment of, for their second conversation, Conversation N. Although the participants were always allowed to choose their conversation topics, when possible, the research assistant encouraged participants to choose a particular topic that seemed to be especially appropriate for the study (e.g., a past conflict between the members of the dyad). Once the dyad decided on a topic, the research assistant provided the following instruction to direct the dyad's conversation:

"As before, please try to fill the whole time by walking through the events of the story, like you are retelling it to another friend who wasn't there. Talk about what you were thinking and feeling at the time. Be sure to specifically explain to each other: what about this experience makes you upset? How did you know—what did you feel in your mind and your body? What did you do, or want to do? Did

you want to yell? Or cry? Talk about how your friend made you feel [sad/angry/etc.], too. The idea is to get back into that memory as much as possible and re-experience the anger or distress that comes along with it. Try to really get back into that emotional place."

The research assistant then began the video recorder and exited the room for five minutes while the participants recounted their negative shared memory. Upon reentry, the research assistant again stopped the video recorder and read to the participants the remaining positive topics, thus requiring the third conversation to be of a different topic than the first for the final conversation, Conversation P$_2$. Once the dyad decided on their topic, the research assistant provided the same instruction as before the first positive topic to direct the dyad's conversation (see script above). The research assistant then began the video recorder and exited the room for five minutes while the participants recounted their positive shared memory. After five minutes, the research assistant reentered the room and stopped the video recorder.

Video review. For the final portion of the session, participants were moved into separate rooms to complete the following video review and coding procedures on independent computers. Participants were informed that the study was looking at how the emotions of others influence how we feel, and therefore they would watch the videos of their conversations and answer some questions about how they were "feeling and managing their emotions throughout the conversations". The video playback was controlled remotely by the research assistant. At 30-second intervals throughout each video, the research assistant paused the video playback and participants provided their responses to the electronic version of the Affect Check-in form. At the end of each

conversation, the participants completed the IER-state to report how they perceived their own interpersonal regulation, as well as their friend's interpersonal regulation, during that specific conversation (Figure 4).

Data Analysis

All data conformed to statistical normality. Latent profile analysis model specifications were conducted in Mplus 7, Version 1.4 (Muthén & Muthén, 1998-2017). All other analyses were conducted with SPSS (Version 24) and used alpha = 0.05 to identify statistical significance.

Latent profile analysis (LPA). A growing body of literature on emotion regulation emphasizes the benefits of using a person-centered approach in statistical analyses (Dixon-Gordon, Aldao, et al., 2015; Doré et al., 2016; Gabriel, Daniels, Diefendorff, & Greguras, 2015). In contrast to a variable-centered approach, which uses continuous variables to establish relationships with outcomes separately and across people, person-centered approaches focus on constellations of variables working as a system within people to influence outcomes. These analyses have the potential to be particularly influential for understanding emotion regulation, as person-centered techniques such as latent profile analysis (LPA) have the power to identify systems of regulatory strategies, thus building a better understanding of the relationships between strategies and their multi-dimensional links to antecedents and outcomes (Gabriel et al., 2015). More specifically, LPA uses the patterns of means on a set of observed indicator variables (i.e., emotion regulation scales) to categorize individuals into distinct, latent classes (i.e., profiles). Therefore, a resulting profile will characterize a homogenous group of individuals who employ similar responses on the indicator variables.

Herein, LPA was used to statistically group participants according to how often they used six emotion regulation strategies: acceptance, cognitive reappraisal, problem solving, avoidance, expressive suppression, and rumination. These groups represent an individual's emotion regulation *profile*, whereby individuals in the same group use similar strategies to regulate their emotions, and individuals in different groups use relatively dissimilar strategies to regulate. This maximizes within-profile homogeneity, while allowing for heterogeneity between the emergent profiles. Although a hierarchical cluster analysis was proposed for creating the emotion regulation profiles, latent profile analysis was chosen due to the ability of this analysis to provide fit statistics to guide the decision on the most appropriate group solution.

The six identified emotion regulation subscales were used as indicator variables. A widely used (see Clark & Muthén, 2009; Morin, Morizot, Boudrias, & Madore, 2011), inductive approach to model specification was taken. In this procedure, the first analysis specified a two-profile model; then, iterative models were run, adding one profile at a time, until the increase in model fit no longer merited the reduction in parsimony produced by adding additional latent groups (i.e. profiles).

To evaluate model fit, eight statistics were examined: log-likelihood (LL), Akaike information criterion (AIC; Akaike, 1973), Bayesian information criterion (BIC; Schwarz, 1978), sample-size-adjusted BIC (SSA-BIC; Sclove, 1987), entropy (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993), Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test, adjusted Lo-Mendell-Rubin likelihood ratio test (adjusted LMR; Lo, Mendell, & Rubin, 2001), and bootstrap likelihood ratio test (BLRT).

Fit statistics for each model were evaluated in relation to the other models. Lower numbers for the LL, AIC, BIC, and SSA-BIC indicate a better fitting model (Nylund, Asparouhov, & Muthén, 2007). Higher entropy values (i.e., values approaching 1) indicate better model classification of individuals into groups (Celeux & Soromenho, 1996). Finally, the VLMR, LMR, and BLRT present significance tests whereby significant p values ($p < 0.05$) for these likelihood ratio tests specify that the estimated model provides a better fit than a model with one fewer profiles (Nylund et al., 2007). Additionally, theoretical considerations were made when determining the best fitting profile structure. This combination of techniques allowed for the determination of the number of profiles that most appropriately fit the data (i.e., profile enumeration). The analysis also provides the estimated probabilities of a participant having each of the profiles specified by the model. Individuals were assigned a profile according to which was most fitting to their regulation pattern across the six strategies (i.e., had the highest posterior probability of profile membership).

The Actor-Partner Interdependence Model (APIM). Given that the friendship dyads will be the fundamental unit of study for this research question, the bidirectional effects between friends' emotion regulation were tested using the Actor-Partner Interdependence Model (APIM; Figure 1) of interpersonal relationships. This analysis allowed the current study to investigate issues of mutual influence of dyad partners on one another by investigating both between-dyad and within-dyad variability (Kenny et al., 2006). As the dyad members in the current study are indistinguishable (i.e., there is no theoretical or empirical factor that can be used to order, or differentiate, the two

persons; Kenny et al., 2006), each of the four APIM estimations herein have only one *actor effect* and one *partner effect*.

The actor effect evaluated whether one's emotion regulation profile (the predictor variable) affects that same person's score on an IERQ subscale total (the outcome variable). Therefore, the indistinguishable partners of the dyad are accounted for within one, overall actor effect per dyad. Using the standardized regression estimates as indicators of predictive relationships, this analysis tested whether there were significant actor effects (i.e., a significant estimate characterizing the relationship between a person's intrapersonal emotion regulation profile and their IERQ subscale score). The partner effect tested whether one friend's emotion regulation profile affects the IERQ subscale score of the other friend in the dyad. Again, the members of the dyad are indistinguishable, and therefore the effects of each person on their friend are accounted for within one overall partner effect per dyad. Standardized regression estimates indicated whether there were significant partner effects present in the model (i.e., a significant estimate characterizing the relationship between an individual's emotion regulation profile and their friend's IERQ subscale score). Each of the four APIM analyses (Figure 2), each differing only according to which IER strategy functioned as the outcome, were estimated using multilevel modeling in SPSS.

RESULTS

Preliminary Results

Means, standard deviations, reliabilities, and bivariate correlations between each of the relevant emotion regulation scales are presented in Table 1. All correlations between the IER strategies were positive and significant (rs = .26 – .50, p's < .05). With regard to the correlations between intrapersonal and interpersonal regulation, individuals who rely more frequently on problem solving were more likely to report greater use of all interpersonal regulatory strategies. Further, individuals describing greater expressive suppression reported greater reliance of others to enhance their positive affect and less reliance on others for interpersonal soothing. Use of cognitive reappraisal was positively correlated with relying on others to enhance positive affect, and rumination was positively correlated with interpersonal regulation via social modeling.

Manipulation check. Self-rated affect was significantly different during the positive conversations as compared to the negative conversation. A single-factor, repeated measures (rm) ANOVA showed the expected differences in positive affect, $F(1.58, 129.70) = 158.02$, $p < .001$ (sphericity assumption violated; Greenhouse-Geisser corrected values reported), such that positive affect was greater during the conversations in which individuals recalled a positive shared memory (mean differences = 2.59 and 2.84, both $p < 0.001$). Another single-factor, rm ANOVA indicated the expected differences in negative affect, $F(1.06, 86.80) = 93.25$, $p < .001$ (sphericity assumption violated; Greenhouse-Geisser corrected values reported), such that negative affect was greater during the conversation about a negative shared memory (mean differences = 2.69

and 2.74, both $p < 0.001$). Self-rated affect was statistically equivalent in the two

conversations about positive topics ($ps > .10$).

Conversation effects. The paradigm used in the current study introduced the

potential for within-subject differences in interpersonal regulation across the three

conversations (i.e., due to time or conversation valence). Therefore, single-factor rm

ANOVAs were run to test for state-level differences in the degree to which individuals

were engaging in interpersonal regulation during each conversation. One test was run to

evaluate intrinsic IER-state ratings (sum of items #1-4; Figure 4) and one test was run for

extrinsic IER-state ratings (sum of items #5-8; Figure 4). The intrinsic ratings analysis

indicated no significant differences across the conversations, $F(2, 81) = 0.05$, $p = .953$,

partial $\eta^2 = 0.001$, indicating that there were no differences in the degree to which an

individual was using their friend to regulate their own emotion across the three

conversations. The analysis of extrinsic IER-state ratings did, however, evidence

significant differences across the three conversations, $F(2, 81) = 14.91$, $p < .001$, partial

$\eta^2 = 0.27$. Follow-up tests showed that the extrinsic regulatory engagement ratings made

for the negative conversation were significantly lower than for the positive conversations

(mean differences $= 1.71$ and 1.80, both $p < 0.001$; see Figure 5). Therefore, individuals

reported that they had less of an influence on regulating their friend's emotions during the

conversation in which they discussed a negative shared experience as compared to either

of the conversations about positive shared experiences.

Research Question 1 – Trait-level Intra- and Interpersonal Emotion Regulation

Latent profile analysis (LPA). Table 2 provides the fit statistics for each tested

LPA. The four-profile solution was determined to provide the best fit to the data. This

solution provided the lowest AIC value. Although a smaller number of profiles (i.e., two-
and three-profile solutions) was supported by the BIC, and a higher number of profiles
(i.e., five- and six-profile solutions) was supported by the LL and SSA-BIC, the small
decreases in these values do not provide decisive evidence for a model with fewer or
greater than four profiles (Kass & Raftery, 1995). As such, the four-profile model
provides the best solution when these differing statistics are taken into account. The
entropy value (entropy = 0.85) indicated that this solution classified 85.3% of individuals
in the correct latent profile and is above the cutoff of 0.80 for a high level of entropy
(Clark & Muthén, 2009). While only the two-profile solution had a significant VLMR
and adjusted LMR, arguing for this model, the BLRT for the four-profile solution was on
the cusp of significance ($p = .05$). Given that all three values were non-significant for the
five-profile solution, in combination with the other fit statistics, the a four-profile model
was retained as the best fit of all of models tested.

The results of the four-profile LPA are displayed in Figure 6. To display the
results more clearly, raw values on each strategy were *z*-score standardized. Positive
values indicate that use of a strategy was above the sample mean and negative values
indicate that use of a strategy was below the sample mean. Groups were labeled
according to the pattern of emotion regulation present in each: 1) the *Adaptive regulation*
group ($n = 47$; 56.0%): values for typically adaptive strategies were above average and
values for typically maladaptive strategies were below average; 2) the *Accepting*
regulation group ($n = 12$; 14.3%): values for acceptance were above average and use of
all other strategies were below average; 3) the *High Regulators* group ($n = 5$; 6.0%): high
(>1 *SD* above the sample mean) use of multiple strategies (i.e., problem solving,

avoidance, and expressive suppression), whereas other profiles are within 1 *SD* above the sample mean on all strategies; 4) the *Maladaptive regulation* group ($n = 20$; 23.8%): values for typically maladaptive strategies were above average and values for typically adaptive strategies were below average.

The Actor-Partner Interdependence Models (APIMs). To examine the concurrent associations between trait intra- and interpersonal emotion regulation, four APIM models (Figure 2) were conducted. One's intrapersonal emotion regulation profile served as the categorical predictor variable (i.e., dummy coded 1-4) and the outcome was intrinsic interpersonal regulation, as measured by one of the four IERQ subscales in each model. The actor effect (i.e., the relationship between a person's regulatory profile and their *own* intrinsic IERQ subscale score; denoted as "a" in Figure 1) and partner effect (i.e., the relationship between a person's regulatory profile and their *friend's* intrinsic IERQ subscale score; denoted as "p" in Figure 1) for each model are presented below.

Enhancing Positive Affect. One's emotion regulation profile was not associated with either one's own use, $F(3, 71.49) = 2.37$, $p = .078$, or a friend's use, $F(3, 71.49) = 1.29$, $p = .285$, of the interpersonal strategy of enhancing positive affect.

Soothing. An individual's emotion regulation profile was not associated with how much they use, $F(3, 76.47) = 1.45$, $p = .236$, or their friend uses, $F(3, 76.47) = 0.08$, $p = .969$, soothing to interpersonally regulate their emotions.

Perspective Taking. Emotion regulation profiles were not associated with either their own use, $F(3, 76.47) = 0.94$, $p = .428$, or their friend's use, $F(3, 76.47) = 0.29$, $p = .833$, of interpersonal perspective taking.

Social Modeling. One's emotion regulation profile was not related to one's own use, $F(3, 71.49) = 1.32$, $p = .274$, or a friend's use, $F(3, 71.49) = 0.42$, $p = .737$, of social modeling IER.

Research Question 2 – State-level Intrinsic IER and Affect

To investigate whether state interpersonal emotion regulation predicts self-rated affect, the four items on the IER-state that assessed the intrinsic regulatory effect were simultaneously entered as predictors in a multivariate linear regression predicting self-rated positive and negative affect (Tables 3, 4, and 5). Thus, this question tested whether the way(s) in which a person uses their friend to regulate are directly related to their affect. Affect was calculated as the overall average of the ratings made during the video review for each conversation. Positive affect reflected average happiness, joy, and emotional connectedness during a conversation; negative affect reflected average distress, frustration, and upset during a conversation.

Conversation P₁. For the first positive conversation topic, only the IER-state item reflecting the interpersonal regulatory strategy of enhancing positive affect (i.e., *"During this conversation, I enjoyed being around my friend because their positivity is contagious."*) was a unique predictor of self-rated affect at the multivariate level, $F(2, 78) = 4.95$, $p = .009$. Parameter estimates indicated that this item predicted positive affect ($\beta = .33$, $p = .002$), but not negative affect ($\beta = -.16$, $p = .129$). Full regression statistics for the overall model are presented in Table 3.

Conversation N. For the negative conversation topic, again only the IER-state item of enhancing positive affect predicted self-rated affect at the multivariate level, $F(2, 77) = 12.70$, $p < .001$. Parameter estimates showed that this item was a significant

predictor for both positive (β = .50, p < .001) and negative affect (β = -.42, p < .001).

Full regression statistics are presented in Table 4.

      Conversation P₂. For the second positive conversation topic, affect was again only predicted by the IER-state item on enhancing positive affect, $F(2, 77)$ = 6.93, p = .002. As in the negative conversation, parameter estimates showed that this item was a unique predictor for positive (β = .31, p = .004) and negative affect (β = -.30, p = .008). Full regression statistics are presented in Table 5.

Research Question 3 – State-level IER and Friendship Quality

      Part A – Intrinsic IER. Analyses were conducted to assess whether the way(s) that an individual uses their friend to regulate their own emotions was directly related to perceived relationship quality. Specifically, multiple linear regression was used to evaluate whether the intrinsic IER-state items predicted self-reported friendship quality, as measured by the MFQ-FF (see Figure 3 – Part A). The IER-state items were simultaneously entered as four individual predictors, and each item represented the average for that item across the three conversations because the dependent variable (friendship quality) was not expected to demonstrate a differential relationship to IER based on the context of the conversation. Results indicated that the intrinsic regulatory affect ratings significantly predicted friendship quality, R^2 = .15, $F(4, 79)$ = 3.37, p = .013. It was found that the item measuring the friend's effect on enhancing positive affect was the only item to emerge as significant, positively predicting friendship quality (β = .25, p = .039). The item reflecting the interpersonal regulatory strategy of social modeling (i.e., *"During this conversation, I used my knowledge of how my friend deals*

with their emotions to help me know what to do.") was a trending predictor of friendship quality ($\beta = .27$, $p = .053$).

Part B – Extrinsic IER. It was also investigated whether the way(s) that a friend uses one's own self to regulate emotion could predict self-reported relationship quality. Again, multiple linear regression was used. The extrinsic IER-state items (simultaneously entered as four individual predictors, each representing the average for that item across the conversations) predicted MFQ-FF scores (see Figure 3 – Part B). Findings showed that extrinsic IER-state ratings were predictive of friendship quality, R^2 = .14, $F(4, 79) = 3.13$, $p = .02$. Parameter estimates indicated that the item measuring one's own effect on enhancing positive affect (i.e., *"During this conversation, my friend enjoyed being around me because my positivity is contagious."*) was the only unique predictor of friendship quality ($\beta = .25$, $p = .046$).

DISCUSSION

Recently the spotlight for theoretical and empirical work in emotion regulation has shifted to pay credence to an inarguable truth: humans are communal beings. While our emotions are indeed privately rooted deep within ourselves, they are at the same time inescapably social. The current study broke from the binary view of emotion regulation as intrapersonal *or* interpersonal, instead putting person-centered approaches into action so that variables at both levels of analysis could be represented as an interdependent system in pairs of young-adult friends. Results of a latent profile analysis (LPA) revealed four, trait-level intrapersonal emotion regulation profiles: *Adaptive regulators, Accepting regulators, High Regulators,* and *Maladaptive regulators* (Figure 6). Findings from a series of Actor-Partner Interdependence Models (APIM; Figure 2) showed that one's intrapersonal regulatory profile was not associated with one's own, or a friend's, trait-level use of interpersonal enhancing of positive affect, soothing, perspective taking, or social modeling.

State-level analyses of the regulatory task completed by the friendship dyads indicated that participants considered their capability to regulate a friend diminished in unpleasant emotional contexts, as their perceived use of extrinsic regulation during negative conversations was lower than regulation during positive conversations. Still, self-assessments of state affect across the conversations confirmed that interpersonal emotion regulation (IER) affected emotion during these conversations. The interpersonal strategy of enhancing positive affect was reliably related to emotionality, regardless of the conversation valence. Notably, this strategy was the only one that was also implicated in how participants felt about the overall quality of their friendship. Stronger

friendships were observed in those dyads who more often relied on their friend to enhance their positive affect or perceived greater ability to increase their friend's positive affect.

Trait-level Connections: Intrapersonal and Interpersonal Regulation

Following the only published study on the trait IER strategies measured by Hofmann and colleagues (2016), social emotion regulation strategies in the current study were all positively intercorrelated with one another. This offers additional support for the authors' conclusion that these methods of interpersonal regulation are highly related. While, the correlations in the current study were notably lower than the moderate-to-strong correlations in the initial validation study (r = .54 – .79; Hoffman et al., 2016), their interrelated use is gaining support. This study also supports previous findings (Hofmann et al., 2016) that interpersonal strategies focusing on changing negative emotion, including perspective taking, soothing, and social modeling, had extensive positive associations with intrapersonal strategies, as well as overall difficulties with emotion regulation (Table 1). In addition to the strategies presented by Hofmann and colleagues (2016), the current study also included problem solving as a variable of interest. Findings showed that these IER approaches targeting down-regulation of negative emotion are also associated with an increased reliance on intrapersonal problem solving. This aligns with assertions that emotions function as dynamic, evolutionary solutions to the universal social problems faced by humans (Keltner & Kring, 1998).

Notably, those individuals who are more active problem solvers also appear to more frequently rely on others to regulate positive emotion, as well as negative emotion, presumably in an attempt to find a preferred intrinsic and relational state. This is

misaligned with Hofmann and colleagues (2016) conclusion that the nature of the relationship between intrapersonal regulation and IER is dependent on whether the interpersonal strategy is targeting positive or negative emotion. This came from their findings on the strategy of enhancing positive affect, which was less reliably related to intrapersonal regulation and regulatory difficulties than the strategies aimed at changing negative affect. Indeed, while the strategy on increasing positivity evidenced mostly non-significant relationships in their study, the current study findings showed that relying on others to enhance positive affect was associated with multiple intrapersonal strategies. Thus, it appears that the inclusion of regulatory actions intended to increase positive affect is critical in advancing the field's understanding of the constellate relationships between individual and interpersonal strategies of emotion regulation.

Proposed Actor-Partner Interdependence Models (APIMs).

Intrapersonal emotion regulation profiles. The current study supports previous work indicating that individuals can be meaningfully grouped according to their multifaceted, intrapersonal emotion regulation patterns. Herein, each participants' trait regulation was characterized by one of four profiles: 1) *Adaptive regulation*; 2) *Accepting regulation*; 3) *High Regulators*; or 4) the *Maladaptive regulation*. The regulation pattern in each of these profiles has also been observed in previous studies (Chesney & Gordon, 2017; Chesney et al., under review; De France & Hollenstein, 2017; Dixon-Gordon, Aldao, et al., 2015; Eftekhari et al., 2009), and a particular consistency is noted for the Adaptive and Maladaptive profile styles. In other words, for many people across samples and methods, use of one adaptive strategy is associated with the use of other adaptive approaches and the non-use of maladaptive approaches. The opposite is also common,

such that there appears to be a significant subset of individuals whose pattern of regulation is dominated by several maladaptive strategies. Although the High Regulators profile only comprised a minority of the sample seen here, this group has comprised sizable proportions of previous samples (Chesney & Gordon, 2016; Dixon-Gordon, Aldao, et al., 2015; Eftekhari et al., 2009). The Accepting regulation profile is seen in previous research assessing individuals' typical social regulation patterns (Dixon-Gordon et al., 2015). Collectively these profiles highlight that, while regulatory patterns are indeed predictable, individuals often demonstrate the flexibility to use a variety of strategies to regulate emotion. A recent meta-analysis concluded that "the habitual use of adaptive [(and maladaptive)] strategies tend to covary with one another, albeit somewhat loosely" (Naragon-Gainey, McMahon, & Chacko, 2017; p. 412), and a good deal of empirical support exists that argues for regulatory flexibility as the key to successfully navigating emotional experiences (Bonanno & Burton, 2013; Bonanno et al., 2004). Therefore, while tending to rely on varied adaptive strategies is a common pattern seen for healthy individuals, alternative strategies—even the maladaptive ones—must be accessible, depending on the context of the situation and the needs of the individual.

Moreover, the field is quickly gaining evidence that a person's emotion regulation profile is linked to their well-being (Chesney & Gordon, 2017; Dixon-Gordon, Aldao, et al., 2015). Indeed, the "adaptive" and "maladaptive" patterns of regulation are named, in large part, due to the reliable relationships they demonstrate to interpersonal outcomes (Gross & John, 2003; Lopes et al., 2005). Further, research is beginning to demonstrate just how important interpersonal regulatory processes are for social relationships. As

such, it is critical to know how (or whether) the dynamic processes of emotion regulation interact, so as to better understand their complex associations to psychosocial outcomes.

Integrative regulatory models. When evaluating the APIMs of intra- and interpersonal regulation strategies (Figure 2), the current study found no support for predicting a dyad's interpersonal regulation from their trait intrapersonal regulation profile. This is contrary to the *actor effect* hypotheses, which proposed a relationship between an individual's intrapersonal emotion regulation profile and that same person's IER. Specifically, it was hypothesized that a High Regulator or Maladaptive intrapersonal regulatory profile would be associated with greater engagement in the intrinsic IER strategies of perspective taking, soothing, and social modeling, as compared to those with Adaptive or profiles characterized by generally low intrapersonal regulation (a profile which was not found in the current study).

While previously published bivariate relationships provide some collective evidence for this hypothesis (Hofmann et al., 2016), intrapersonal strategies still showed differential relationships to each of the IER strategies. Furthermore, half of the strategies included in the profiles (i.e., problem solving, avoidance, rumination) had not previously been examined in conjunction with the IERQ strategies, and varying relationships—many of which were non-significant at the bivariate level—continued to be seen in the current sample. Thus, one explanation of these null findings is that combining the intrapersonal strategies into a single profile is unintendedly causing the underlying differential relationships to cancel out. This aligns with the null relationship between one's regulatory profile and the strategy of enhancing positive affect, as no a priori hypothesis was made regarding the relationship of this strategy to the regulatory profiles due to its

variable and limited associations. Alternatively, it is possible that trait-level use of the measured intrapersonal strategies is not directly related to overall reliance on others for management of negative affect in these three, interpersonal ways. The function of the relationship between individual and social strategies may instead vary according to the nature of the emotional circumstance, and the field's need for contextualizing regulatory actions may be especially relevant in modeling these two levels of analysis.

Further, there were no *partner effects* found for any of the models, which indicates that there are no relationships between one individual's intrapersonal regulatory profile and their friend's reliance on them to assist with managing emotion. Here, hypotheses were speculative, but proposed that a Maladaptive profile would be associated with less reliance by a friend on that individual for regulation. Notably, however, the trait-level IER questionnaire did not prompt individuals to indicate how much they typically rely on the specific friend with whom they participated for regulation. Instead, participants responded globally to indicate their usual reliance on others to regulate, across all of their relationships. Therefore, the predictor variables represented specific characteristics of one individual, and the outcome variables considered characteristics of innumerable relationships with individuals who assist with regulating emotion. Given that relationships offer varying types, qualities, and degrees of emotional support, it is likely that non-significant relationships arose from attempting to use a specific variable (i.e., one friend's intrapersonal regulation) to predict an expansive, general outcome (i.e., a person's IER engagement across all relationships).

Additional considerations should be made when conducting an APIM, or similar analyses, in future research. First, though previous studies utilizing similar methods have

indicated that the current sample of 40 dyads was sufficient (Parkinson, Simons, & Niven, 2016), there is no universal sample size requirement for APIM (Kenny et al., 2006), and the complex analytical model presented here may require greater power to uncover the complex relationships between these variables. Second, given the importance of additional variables known to be related to both emotion regulation and interpersonal processes (e.g., defensiveness; Garofalo, Velotti, Zavattini, & Kosson, 2017), future studies should seek to systematically include such variables to establish whether they help to explain the interactions between individual and social emotion regulation processes.

Psychosocial Outcomes of State IER

Intrinsic Emotion Regulation. Intrinsic emotion regulation refers to instances where a person relies on someone else to regulate their own emotional state. This form of regulation was captured via self-assessments of how much a friend was influencing one's own affect. Hypotheses related to intrinsic regulation were partially supported. Although it was hypothesized that all forms of state IER would demonstrate relationships with state affect and overall friendship quality, the strategy of enhancing positive affect was the only regulatory method significantly associated with these outcomes. This supported the hypothesis that the relationships between IER and psychosocial correlates are dependent on the regulatory strategy.

With regard to state affect, findings herein support that the degree to which a person relies on a friend to enhance their positive affect was generally related to more desirable emotional outcomes, regardless of the emotional valence of a conversation. Thus, this strategy appears universally effective at increasing positive affect, and it is also

helpful for managing negative affect during and after an unpleasant emotional experience. This finding was contrary to the hypothesis that higher levels of intrinsic state IER would predict greater negative affect and lesser positive affect. This hypothesis was based on previous findings which indicate that the degree to which someone uses soothing and social modeling for regulation is directly related to symptoms of anxiety, and that these strategies along with perspective taking are related to more severe depression (Hofmann et al., 2016). However, these three strategies arguably target the reduction of negative affect, whereas the strategy of enhancing positive affect directly seeks to increase positive affect. Indeed, Hofmann and colleagues (2016) also concluded that IER focused on increasing positive affect functions differently, and has different outcomes, than IER focused on negative affect regulation. Given that these authors found that enhancing positive affect was generally unrelated to self-reported severity of anxiety and depression, whereas the other three scales of the IERQ indicated small-to-moderate relationships with symptom severity, perhaps positivity-related regulation is more effective at improving one's mood in the current sample of healthy individuals not experiencing clinically-elevated psychological distress.

Intrinsic IER targeting the enhancement of positive affect during the emotional conversation tasks was also important for how individuals rated the overall quality of their friendship. Specifically, greater reported use of a friend's positivity to increase one's own was found to be associated with stronger friendships. Given the proposed functionality of emotion to serve as relational, dynamic adaptations to the problems faced by all humans living inherently social lives (Keltner & Kring, 1998), this finding underscores the importance of further study on positive affect, and positive affect

regulation, as it relates to a person's ability to find ideal interpersonal conditions and experience social benefits. For example, the *broaden-and-build* theory of positive emotions outlines the complementary, but differential, features of negative and positive emotion (Fredrickson, 2001, 2004). While negative emotions narrow and focus an individual to prepare and activate them for action, positive emotions are proposed to broaden a person's cognitions and behaviors to build their resources for the future. IER may be a proximal mechanism through which positive affect affects the strength of social support resources, and therefore warrants further attention with regard to a contemporary understanding of emotion regulation. Empirical findings on happiness that indicate positive affect aids cognitive, behavioral, and social processes to improve outcomes during a task, as well as boosts resources for future social and cognitive demands (Aspinwall, 1998; Fredrickson, 1998), also fail to integrate complex, social regulatory processes. Moreover, these interpersonal processes are likely working in parallel with intrapersonal processes. Regulation studies have demonstrated a person's abilities to amplify their own positive affect via behavioral strategies, such as smiling despite feelings of sadness (Ekman, 1989), and cognitive strategies, such as engaging in positive rumination or attending to a positive present moment (Quoidbach, Berry, Hansenne, & Mikolajczak, 2010). As such, multifactorial psychosocial assessments of united intrapersonal and interpersonal up-regulation of positive affect will significantly improve the field's conceptualization of the mechanisms underlying adaptive emotionality.

Extrinsic Emotion Regulation. Extrinsic emotion regulation describes one person's attempts to regulate someone else's emotional state. This form of regulation was captured via self-assessments of how much a participant believed they were being

relied upon to influence their friend's affect. Although the current analyses did not

evaluate whether one's state affect was related to extrinsic IER, this possible connection

presents an important question for future study. It is unknown, for example, whether the

degree to which an individual perceives that they are able to increase a friend's positive

affect by spreading their own positivity may result in feelings of satisfaction, burden, or

have no significant effect on emotionality. Certainly, a great number of variables are

likely to differentiate the personal, affective consequences of regulating others, including

one's perception of their regulatory effect on another person. Findings from the current

study showed that individuals believed their regulation of their friend's emotions was less

during the negatively-valenced conversation as compared to the positively-valenced

conversations. This suggests individuals perceive that they have a diminished role in the

regulation of others during moments of negative emotionality. Notably, previous

research indicates that this lessened effect may be buffered by strong feelings of

relatedness. Specifically, research indicates that feeling similar to a friend can buffer

negative affect for some individuals (Chatterjee, Baumann, & Koole, 2017) and strongly

implicates the importance of evaluating the relationships between IER and characteristics

of the friendship.

Present hypotheses that extrinsic IER would be related to overall friendship

quality were partially supported. Although no previous literature suggested that a

particular IER strategy may be more related than another, again only the strategy of

enhancing positive affect was connected to friendship quality. The direct relationship

indicated that higher rated friendship quality was associated with one's perceived

effectiveness at increasing a friend's positive emotionality during a positive conversation.

This may be related to previous findings that people who smile more frequently and with more intensity are rated as better potential friends, with less social difficulties and emotional lability, than those who do not smile as much (Harker & Keltner, 2001; Reis et al., 1990; Shiota, Campos, Keltner, & Hertenstein, 2004). In combination with the results on intrinsic IER, this finding highlights the strategy of enhancing positive affect as most related to social and emotional outcomes and supports the argument that strategies focused on increasing positivity function differently than strategies focused on negative affect regulation.

Limitations and Future Directions

To fully acknowledge the duality of social regulation and unite the intrapersonal domain with the interpersonal domain of emotion, studies must address the current limitations associated with each level of analysis. The present study is also not without limitations. The current sample size was relatively small, especially for the advanced statistical analyses completed here (e.g., LPA, APIM). Future studies would benefit from larger sample sizes to ensure that statistical power is sufficient to address type II error. Further, a larger sample would address limitations that the characteristics of the current sample (e.g., female, undergraduate) impart on generalizing these results to other populations. It is probable that the average length of time that has passed since becoming friends is also a factor in the dynamic emotion systems studied here. As such, the current sample's median friendship length of eight months may be characteristic of a particular type of relationship—one that was recently formed upon the relatively distinct stressor of arriving to college and is still fairly nascent in development. Future studies would benefit

from investigating friendships of various qualities, in particular by varying the length of the friendships and the gender of friendship dyads.

Given that all data were collected at one timepoint, there was no possibility to analyze changes in emotion regulation strategy use or friendship quality over time. Future studies may investigate the natural changes in these processes over time, as well as the antecedents and consequences of change. Additionally, paradigms such as the one presented here allow for the addition of an intervention portion, whereby individuals experiencing emotional conflict might undergo education or role-play exercises targeted on addressing communication and emotion regulation. Especially when extended over series of sessions, translational studies such as these could inform our clinical understanding of the dynamic interpersonal processes in emotion.

The multi-strategy assessments of trait and state emotion regulation used in the current study are relatively novel, and therefore require continued investigation, improvement, and validation. However, they offer a promising direction to address the limited knowledge of emotional and social outcomes associated with IER, such as expanding on current measures which do not assess state regulation or extrinsic IER, and offer insight as to how social regulation may be successful or damaging. Additionally, this study included a novel laboratory paradigm to assess regulatory practice, allowing for questions to be asked about the natural state regulation occurring in a given emotional situation. While this paradigm would also benefit from continuing to work on bettering its implementation, this method is an important departure from measures of regulatory ability—which often restrict a person's regulation choice to a particular strategy to measure their "success". Adapting such work as Levenson and Gottman (1983)—who

developed a laboratory-based social task requiring multiple individuals to engage in emotionally-evocative conversations on topics of varying emotional valences—the current study employed multiple methods of assessing state and trait emotional experience, responding, and regulation between friends.

Conclusions

Emotions guide our internal selves, as well as our social and environmental relations. Considering constellations of regulatory strategies to represent how a person manages their emotionality within multiple, interdependent systems of regulation allowed the current study to more thoroughly examine links to regulatory antecedents and psychosocial outcomes. Herein, the issues of comprehensive strategy evaluation and assessment of social regulation in the actual presence of another person were addressed with a novel IER paradigm. Advanced, person-centered analyses allowed us to confirm that interpersonal regulation directed at up-regulating positive affect has significance for how people feel throughout the course of emotionally-charged conversations, as well as how strong they perceive the overall quality of a friendship. This is in contrast to interpersonal regulation intended to down-regulate negative affect, which appears to be less—if at all—related to these measures of state emotionality and friendship quality. Still, there is much work to be done, particularly with regard to understanding how intrapersonal and interpersonal regulation patterns are related. Future studies are encouraged to continue to develop creative affective paradigms that delve into the intricate dance of actors and reactors relying on their strengths, heeding their weaknesses, simultaneously attending to their own needs and the needs of others, and oscillating between moments of individual and social regulation.

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Table 1

Means, Standard Deviations, and Correlations of Relevant Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
Intrapersonal ER												
1. Acceptance	21.82	5.38	(.90)									
2. Cog. reappraisal	28.98	6.21	.24*	(.86)								
3. Prob. solving	12.50	3.13	-.01	.58***	(.72)							
4. Avoidance	16.12	5.72	-.42***	-.14	.01	(.74)						
5. Exp. suppression	12.80	4.62	-.24*	-.05	-.03	.36***	(.72)					
6. Rumination	6.19	2.07	-.23*	-.22*	.07	.14	-.11	(.72)				
Interpersonal ER												
7. Enhancing PA	22.12	3.29	-.03	.24*	.26*	.03	.25*	.16	(.89)			
8. Soothing	16.46	4.68	-.12	.20	.28**	.09	-.38***	.13	.43***	(.88)		
9. Perspective taking	12.05	4.79	.07	.17	.22*	.09	-.12	-.01	.28*	.45***	(.83)	
10. Social modeling	15.99	4.83	-.01	.08	.27*	.11	-.21	.22*	.26**	.44***	.50***	(.91)

Note. Reliabilities are in parentheses along the diagonal. *p < .05; **p < .01; ***p < .001.

Table 2

Fit Statistics for All Tested Latent Profile Analysis Models (N = 84)

Number of Profiles	% (n)		LL	AIC	BIC	SSA-BIC	Entropy	VLMR (p)	Adjusted LMR (p)	BLRT (p)
2	66.67 (56) 33.33 (28)		-1419.945	2877.890	2924.075	2864.140	0.882	0.0410	0.0459	< 0.0001
3	58.33 (49) 26.19 (22) 15.48 (13)		-1406.639	2865.277	2928.479	2846.461	0.794	0.7353	0.7428	0.0128
4	**55.95 (47) 23.81 (20) 14.29 (12)**	**5.95 (5)**	**-1391.689**	**2849.379**	**2929.596**	**2825.497**	**0.853**	**0.4308**	**0.4439**	**0.0500**
5	32.14 (27) 27.38 (23) 21.43 (18)	14.29 (12) 4.76 (4)	-1385.794	2851.588	2948.820	2822.639	0.828	0.6249	0.6292	1.0000
6	39.29 (33) 25.00 (21) 13.10 (11)	13.10 (11) 7.14 (6) 2.38 (2)	-1379.620	2853.239	2967.488	2819.225	0.830	0.4758	0.4803	1.0000

Note. LL = log-likelihood; AIC = Akaike information criterion; BIC = Bayesian information criterion; SSA-BIC = sample-size-adjusted BIC; VLMR = Vuong-Lo-Mendell-Rubin likelihood ratio test; adjusted LMR = adjusted Lo-Mendell-Rubin likelihood ratio test; BLRT = bootstrap likelihood ratio test. The model determined to provide the best fit to the data is in bold.

Table 3

Multivariate Regression Analyses for State-level Intrinsic IER Predicting State Affect – First Positive Conversation

IER strategy	Positive affect			Negative affect		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Enhancing Positive Affect	.80	.26	.33**	-.16	.11	-.17
Perspective Taking	.17	.15	.15	.07	.06	.17
Soothing	-.11	.15	-.09	.07	.06	.15
Social Modeling	.21	.16	.17	-.08	.06	-.16
R^2		.18			.09	
df		(4, 79)			(4, 79)	
F		4.44**			1.87	

Note. **p < .01.

Table 4

Multivariate Regression Analyses for State-level Intrinsic IER Predicting State Affect – Negative Conversation

IER strategy	Positive affect			Negative affect		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Enhancing Positive Affect	.80	.18	.50***	-.87	.24	-.42***
Perspective Taking	.06	.18	.04	.01	.25	.01
Soothing	-.10	.21	-.06	.45	.29	.21
Social Modeling	-.04	.18	-.02	.28	.24	.14
R^2		.24			.17	
df		(4, 78)			(4, 78)	
F		6.24***			3.94**	

Note. **$p < .01$; ***$p < .001$.

Table 5

Multivariate Regression Analyses for State-level Intrinsic IER Predicting State Affect – Second Positive Conversation

IER strategy	Positive affect			Negative affect		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Enhancing Positive Affect	.76	.26	.31**	-.24	.09	-.30**
Perspective Taking	.13	.20	.10	-.01	.07	-.02
Soothing	-.01	.19	-.01	.10	.07	.24
Social Modeling	.25	.18	.17	-.06	.06	-.12
R^2		.18			.13	
Df		(4, 78)			(4, 78)	
F		4.38**			2.91*	

*Note. *p* < .05; **p* < .01.*

Table 6

Multiple Regression Analyses for State-level IER Predicting Friendship Quality

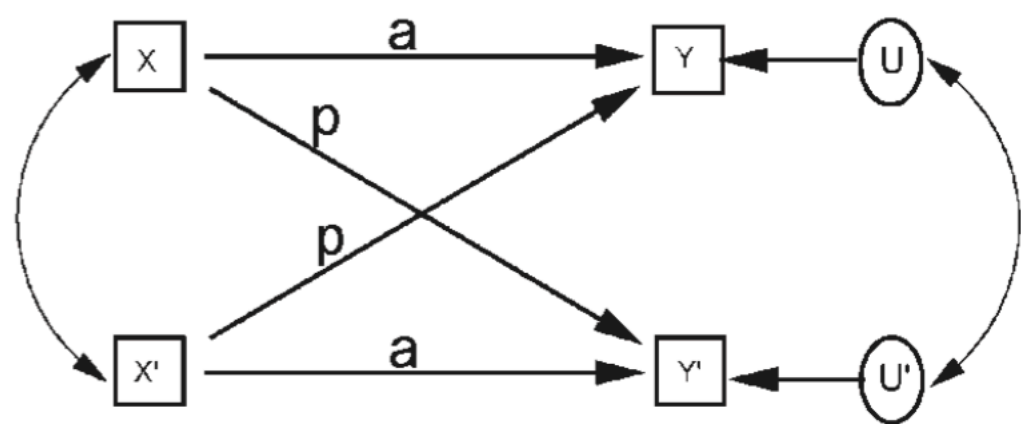| IER strategy	Intrinsic IER			Extrinsic IER		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Enhancing Positive Affect	.33	.16	.25*	.33	.16	.25*
Perspective Taking	-.12	.12	-.16	-.20	.12	-.26
Soothing	-.01	.12	-.01	.09	.12	.12
Social Modeling	.21	.11	.27	.18	.12	.21
R^2		.15			.14	
Df		(4, 79)			(4, 79)	
F		3.37*			3.13*	

Note. *p < .05

Figure 1. The Actor-Partner Interdependence Model (APIM). X represents data for Person A, and X' represents the same variable's data for Person B. Y represents outcome data for Person A, and Y' represents the same outcome data for Person B. U and U' represents the residual (unexplained) portion of the outcome variable for Person A and B, respectively. Single-headed arrows represent predictive paths, whereas double-headed arrows indicate correlations. Paths labelled with an "a" show actor effects and paths labelled with a "p" show partner effects. Figure reproduced from Cook and Kenny, 2005.
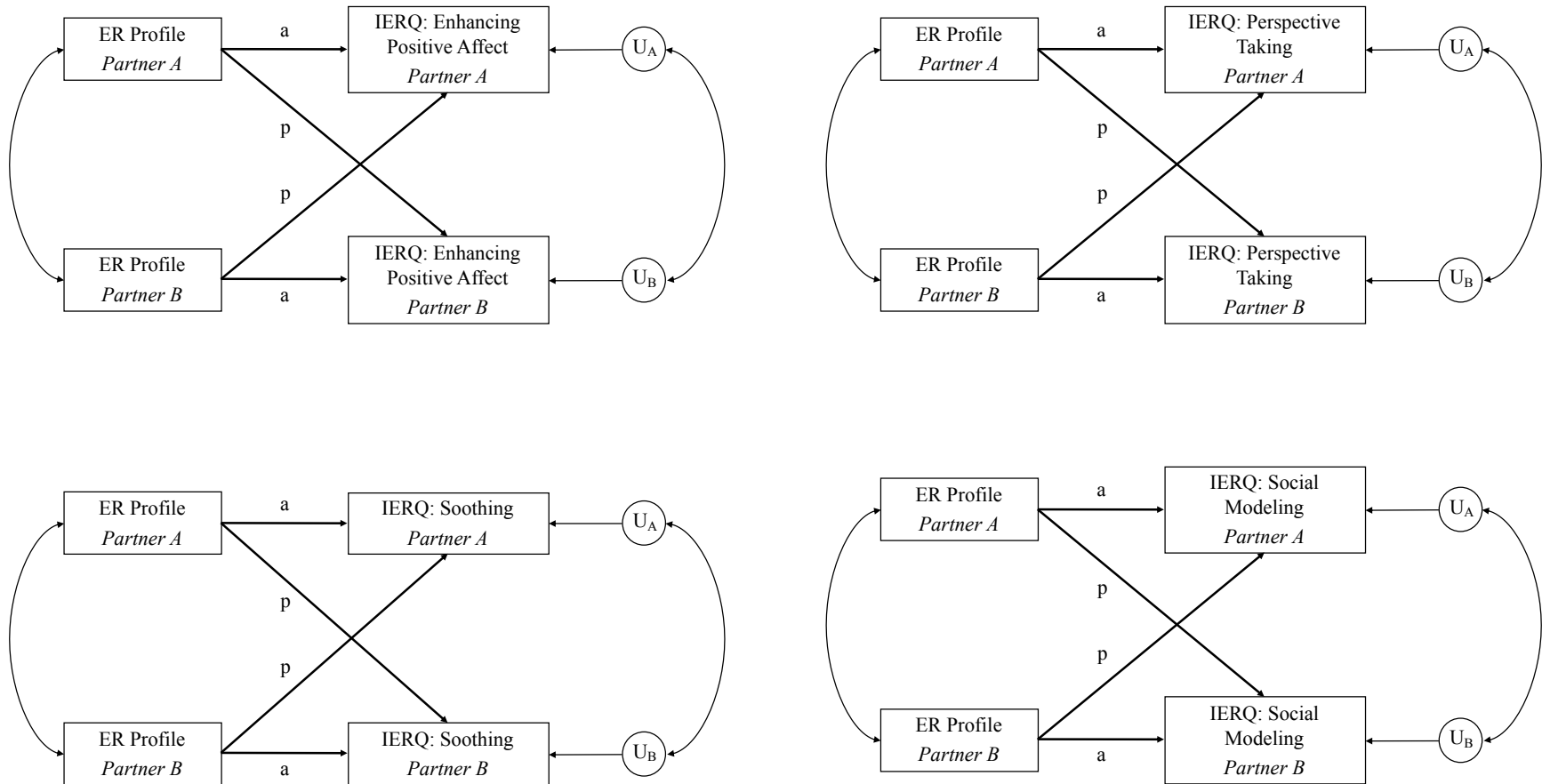
Figure 2. APIM analyses investigated in the current study (Research Question 1). One model was specified for each of the four interpersonal emotion regulation strategies measured by the Interpersonal Emotion Regulation Questionnaire: 1) enhancing positive affect; 2) soothing; 3) perspective taking; and 4) social modeling.
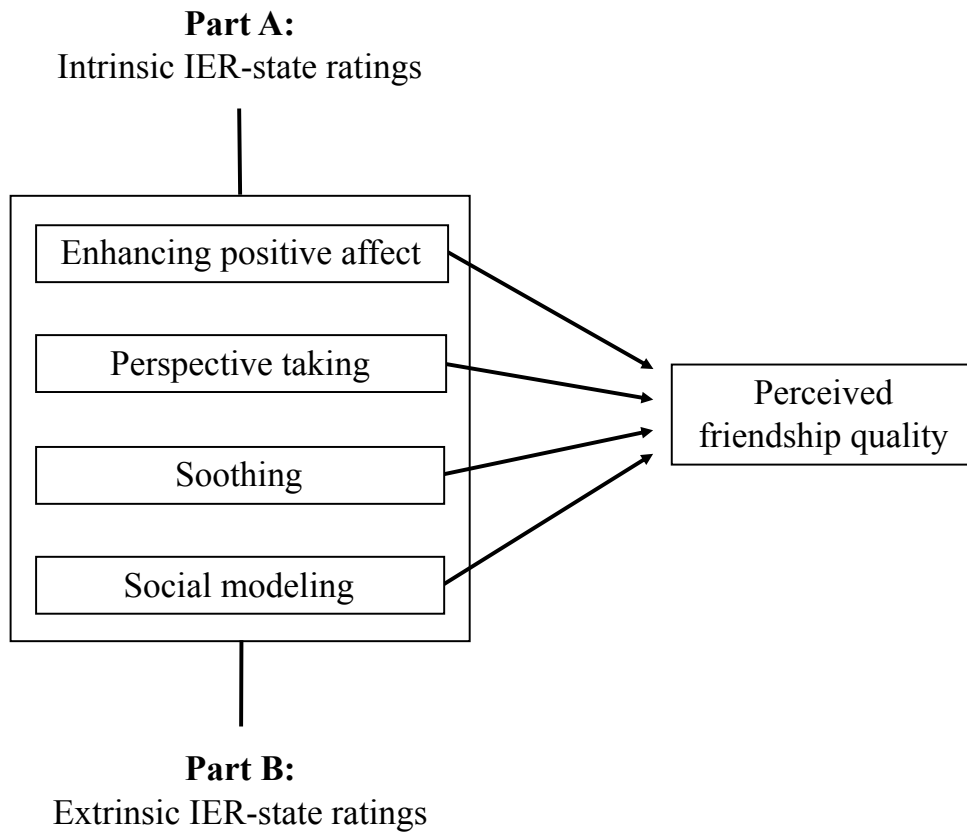
**Part A:**
Intrinsic IER-state ratings

Enhancing positive affect

Perspective taking

Soothing

Social modeling

Perceived
friendship quality

Part B:
Extrinsic IER-state ratings

Figure 3. Analyses for Research Question 3 – Parts (A) and (B).

IER strategy	**Intrinsic items** *Perceived regulatory effect of friend on one's self*	**Extrinsic items** *Perceived regulatory effect of one's self on friend*
Enhancing positive affect	#1. During this conversation, I enjoyed being around my friend because their positivity is contagious.	#5. During this conversation, my friend enjoyed being around me because my positivity is contagious.
Perspective taking	#2. During this conversation, I felt better because my friend let me know that there's no reason to worry, since my situation could be worse.	#6. During this conversation, my friend felt better because I let them know that there's no reason to worry, since their situation could be worse.
Soothing	#3. During this conversation, I turned to my friend for comfort and consolation.	#7. During this conversation, my friend turned to me for comfort and consolation.
Social modeling	#4. During this conversation, I used my knowledge of how my friend deals with their emotions to help me know what to do.	#8. During this conversation, my friend used their knowledge of how I deal with my emotions to help them know what to do.

Figure 4. The Interpersonal Emotion Regulation–State (IER-State) Questionnaire. This questionnaire, administered during the video review procedure, measured perceptions of interpersonal regulatory influence during the emotional conversation task. Participants independently answered all eight questions immediately after watching the video playback of each conversation. For a subset of analyses, the four items in each column were grouped according to whether they measured intrinsic or extrinsic regulation.
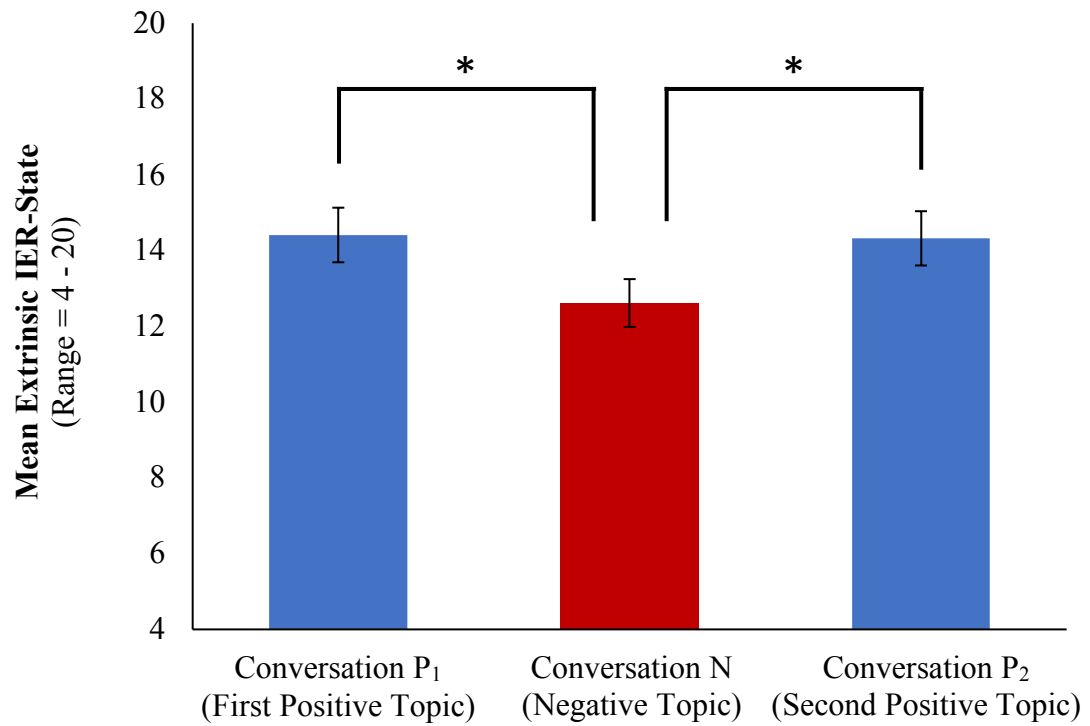
Figure 5. Conversation effects for state-level differences in interpersonal emotion regulation. Results indicated that degree to which individuals engaged in extrinsic regulation during the negative conversation topic (Conversation N) was significantly lower than during the positive conversations (Conversations P_1 and P_2; $*p < 0.001$). There were no significant differences for state-level intrinsic IER across the conversations.

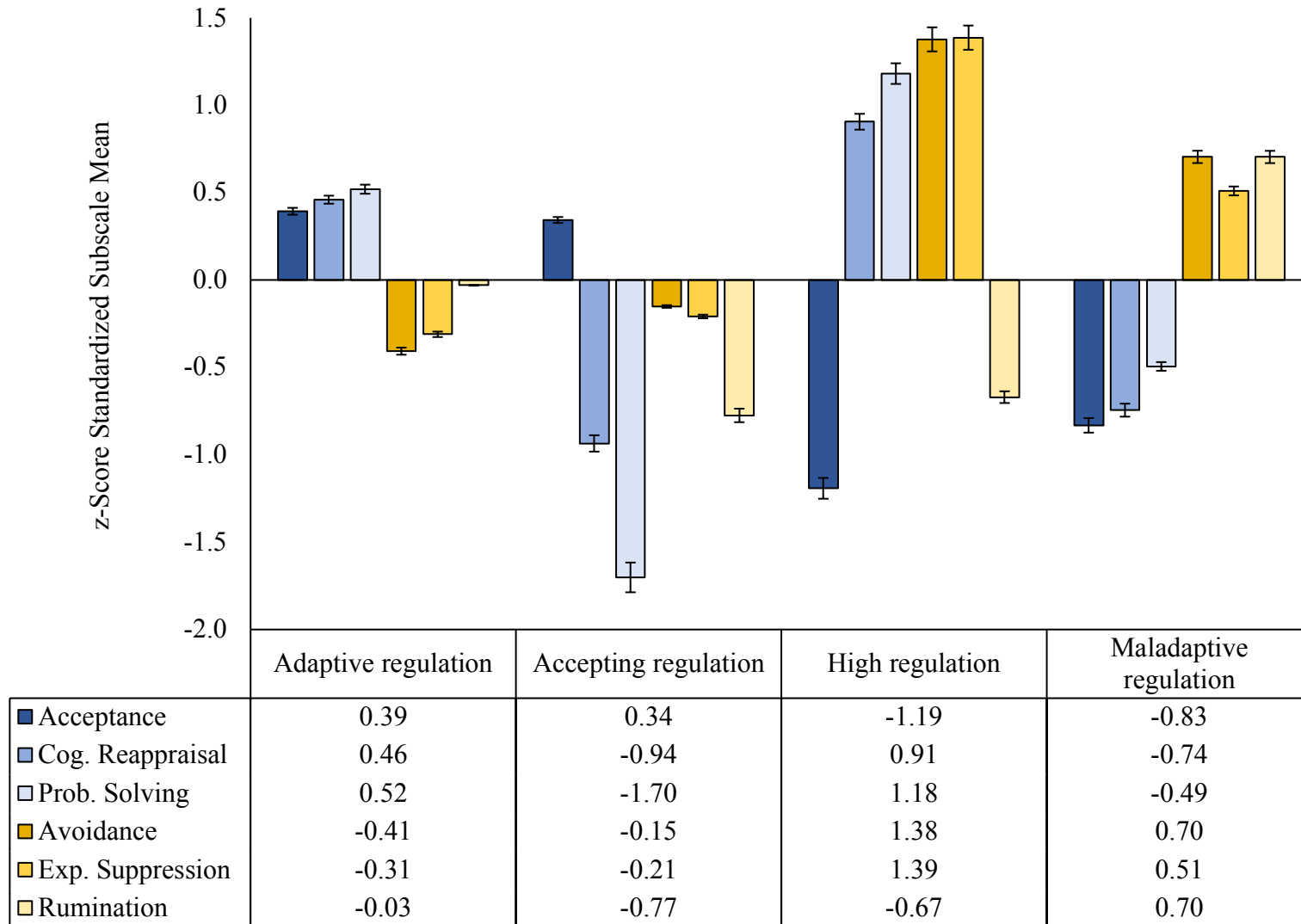|	Adaptive regulation	Accepting regulation	High regulation	Maladaptive regulation
■ Acceptance	0.39	0.34	-1.19	-0.83
■ Cog. Reappraisal	0.46	-0.94	0.91	-0.74
□ Prob. Solving	0.52	-1.70	1.18	-0.49
■ Avoidance	-0.41	-0.15	1.38	0.70
■ Exp. Suppression	-0.31	-0.21	1.39	0.51
□ Rumination	-0.03	-0.77	-0.67	0.70

Figure 6. Intrapersonal Emotion Regulation Profiles.