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Extrinsic Emotion Regulation at the Global and Daily Level: Strategy Choice and Associations with Regulator Well-Being

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ABSTRACT

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by

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Master of Philosophy in Psychological and Brain Sciences

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Extrinsic emotion regulation (i.e., the goal directed process of managing someone else's emotions) can influence not only the target, but also the regulator. Through effective extrinsic emotion regulation (ER), a regulator can strengthen their relational bonds, leading to subsequent enhancement of regulator well-being at the trait and state level. The aim of this study was to examine the associations between extrinsic ER strategy use (situation modification, attentional deployment, reappraisal, suppression) and regulator well-being, and the contextual predictors of extrinsic ER in daily life. Undergraduates (N = 198) completed a trait survey assessing extrinsic ER and well-being outcomes, followed by 14 days of momentary surveys (7x/day, every 2 hours) reporting on their current emotion, extrinsic ER, and social interactions. Trait extrinsic ER was not consistently predictive of global indicators of regulator well-being, but situation modification and suppression predicted greater regulator daily negative affect (NA). Momentary use of attentional deployment predicted lower NA, while reappraisal and suppression predicted greater

NA. In terms of contextual predictors, there was a positive association between the presence of close others and extrinsic ER aimed at modifying a target's emotional experience. Situations containing more negativity were associated with greater use of all extrinsic ER strategies, whereas those requiring more cognitive demand were associated with a lower likelihood of extrinsic ER, though greater time and effort once implemented. This research could shed light on the contextual factors that regulators consider when deciding how to respond to others during emotional episodes, and implications for the regulator's emotional well-being.

1. Introduction

When interacting with a friend who is upset, you can respond in any number of ways to help manage their emotions. These goal-directed attempts by a regulator to help an external target change the nature, duration, or intensity of their emotional experience or expression is referred to as *extrinsic emotion regulation* (Nozaki & Mikolajczak, 2020; Reeck et al., 2016; Zaki & Williams, 2013). For instance, the friend may have learned that they did not get a job after 3 rounds of interviews. In response you could tell them it probably worked out for the best because they would have had to relocate. Alternatively, you may try to turn their attention elsewhere, by inviting them out to see a movie to get their mind off their disappointment for a while. What contextual factors does the regulator consider when determining how to respond? And what are the implications for the regulator in these social exchanges? In the present study, we seek to address these questions about how extrinsic emotion regulation (ER) is employed at the trait level and in daily life, and the implications for the regulator.

1.1 Emotion Regulation in Interpersonal Contexts

Emotion regulation is crucial to well-being and interpersonal functioning. Difficulties with ER are consistently implicated in mental health (Joormann & Gotlib, 2010). The way people regulate their own emotions in daily life is tied to life satisfaction, depressive symptoms, and relationship satisfaction (Cameron & Overall, 2018). Moreover, these associations spill over into interpersonal contexts (Butler et al., 2003). For instance, one meta-analysis found that greater suppression of emotional expression was associated with more negative first impressions and lower social support (Chervonsky & Hunt, 2017). Emotions play a functional role, influencing individuals' behavior and the course of social interactions (Keltner & Lerner, 2010). As such,

how emotions are regulated in social contexts is critical to the building and maintenance of social bonds, which could contribute to one's well-being outcomes.

There is a growing appreciation for examining ER from an interpersonal perspective. People often share their emotional experiences with others (Rimé, 2009), facilitating opportunities to involve external parties in the regulation process. During these social exchanges one can regulate intrinsically or extrinsically. Intrinsic ER involves the regulation of one's own emotions whereas extrinsic ER involves helping someone else manage their emotions (Zaki & Williams, 2013). Much of the research on ER in interpersonal contexts focuses on intrinsic regulation in which one utilizes social resources to help manage their own emotions (Barthel et al., 2018; Liu et al., 2021). However, our social exchanges may also involve efforts towards helping others regulate their emotions. Researchers are just starting to examine the effects of extrinsic ER (Hofmann et al., 2016; Niven et al., 2019), and most of this research utilizes trait measures or laboratory designs that do not always translate to daily interactions (Koval et al., in press). Since extrinsic ER is inherently social in nature, and the opportunity only arises in social interactions, it is important to examine how it unfolds in daily life and features of the contexts in which different interpersonal regulatory behaviors occur.

Most existing work on extrinsic ER focuses on effects for the target of regulation attempts without considering ways the regulator could be affected (Niven et al., 2019). As suggested by theoretical and empirical work, in such interpersonal interactions both the target of the regulation attempts (Zee & Bolger, 2019) and the regulator themselves may be affected (Niven et al., 2012). To better understand the consequences of emotional social exchanges, it is crucial to examine the consequences of extrinsic ER on the regulator. In doing so, it is essential to examine extrinsic ER

at both the trait and state level to get a sense of the immediate and long-term effects of such regulatory behaviors given that the effects of ER can vary temporally (Gross, 2002).

The front matter includes all material that appears before the beginning of the body of the text. Number all front matter pages (except the title page and the optional copyright page) with lowercase roman numerals, starting with ii, centered just above the bottom margin. Each of the following sections should begin on a new page.

1.2 The Consequences of Extrinsic Emotion Regulation on the Regulator

Prior research has established that intrinsic ER is predictive of well-being (Gross & John, 2003), but what about extrinsic ER? Helping others manage their emotional experience may be a rewarding experience for the regulator. Humans have a natural capacity to care for, nurture, and protect others, especially during times of need (Bowlby, 1988). Neurological studies support this idea, showing that the provision of social support activates brain regions associated with pleasure and rewards for the supporter (Inagaki & Orehek, 2017). Importantly, it is the provision of emotional support, more than instrumental support, that consistently predicts regulator well-being (Morelli et al., 2015). Experimental research also shows that helping others can be beneficial for the provider. In one intervention, participants completed acts of kindness exercises for 3 weeks, and reported greater reductions in depression and increases in life satisfaction relative to a control condition (Mongrain et al., 2018). These effects persisted even 2 months later, suggesting that these helping behavior changes had long-lasting effects on the participants' well-being. The findings collectively align with the idea that helping others can be a rewarding experience for the regulator. For instance, regulators may feel proud of being helpful and supportive of others during times of emotional distress. Short term, extrinsic ER may be

associated with increases in positive affect and decreases in negative affect, while long-term these behaviors could build social resources that produce a payoff in terms of returned love, support, and security (Clark, 1983), increasing one's life satisfaction.

The Model of Social Regulation of Emotion (Reeck et al., 2016) specifies the process involved in regulating another person's emotions, which involves identifying the need to regulator, selection, and then implementation of an extrinsic ER strategy. The regulator must first detect the need to regulate the target's emotion, then weigh aspects of the situation to determine whether and how they would like to help someone regulate their emotions. Extrinsic ER behaviors can provide the target cues about the regulator's engagement, support, investment, and reputation. When implemented effectively, extrinsic ER can foster relationship building processes, but if done ineffectively, it could lead to interpersonal conflict, which may result in negative consequences for both the regulator and target. Furthermore, while extrinsic ER can be rewarding and yield interpersonal benefits, it can also be cognitively demanding, depleting the regulator's resources and energy (Martínez-Íñigo et al., 2013).

One factor that may determine whether and how people engage in extrinsic ER is the nature of their relationship with the target. Individuals may be more willing and able to engage in extrinsic ER with close others because they know that person better and are more committed to helping them. Closeness and familiarity may facilitate knowing what the target needs, and an increased willingness to put forth more time, effort, and energy towards maintaining their relationships (Halford et al., 2007). One way in which to do this is to provide emotional support in the form of extrinsic ER. Neurological research suggests that extrinsic ER utilizes the same brain regions as intrinsic ER like the left anterior temporal pole and inferior temporal gyrus, but extrinsic ER also engages rostral prefrontal cortex, right anterior insula, and areas of the cingulate gyrus, regions

of the brain that are associated with mentalizing and empathy (Hallam et al., 2014). People may be more motivated to empathize in the presence of close others, leading to greater extrinsic ER efforts and perhaps increased use of strategies perceived to be most effective in managing others' emotions.

1.3 Emotion Regulation Strategies

The regulator can enlist any number of strategies when helping others manage their emotions. To categorize the ways in which a regulator might engage in ER, the process model of emotion regulation (Gross, 1998b) highlights how emotions unfold over time and therefore can be regulated at different points along this timeline. Research consistently shows that that the earlier one can intervene in the emotion generation process, the more effective the regulation attempts (Gross, 1998a). Intrinsically, one can regulate their emotions by modifying a situation to alter its emotional impact (i.e., *situation modification*), guiding their attention toward or away from specific aspects of a situation (i.e., *attentional deployment*), changing the way they think about and give meaning to a situation (i.e., *cognitive change*), or modulating how one responds to an emotion once they are experiencing it (i.e., *response modulation*). *Situation modification* and *attentional deployment* occur early in the emotion generation process and have been shown to be effective in downregulating negative affect (Van Bockstaele et al., 2020). *Reappraisal*, a form of cognitive change in which one changes the meaning they give to a situation, is associated with the increases in positive affect and decreases in negative affect, and positive interpersonal functioning (Gross & John, 2003). *Expressive suppression* (i.e., the inhibition of emotion expression) is a commonly studied type of response modulation that has been associated with negative well-being and poor interpersonal outcomes (Gross & John, 2003), suggesting that this strategy when used intrinsically can inhibit the creation of social bonds. A meta-analysis

investigating the effectiveness of ER strategies on modifying emotional outcomes similarly found that attentional deployment and reappraisal were effective at managing emotions, while expressive suppression was not (Webb et al., 2012). This review did not include examinations of situation modification, in part because there are a limited number of experiments testing how people use this strategy to regulate how they feel (Livingstone & Isaacowitz, 2015). Taken together, these findings suggest that situation modification, attentional deployment, and reappraisal are effective ER strategies when used intrinsically, but suppression is not.

The same strategies used to regulate emotions intrinsically can be implemented extrinsically, that is, to manage someone else's emotions. The process model of ER posits that emotions can be regulated as they unfold, with antecedent-focused strategies targeting the input of information, and response-focused strategies being implemented after an emotional response has fully unfolded (Gross, 1998b). In interpersonal contexts, the regulator must infer the emotional state of the target individual in order to effectively help them regulate (Reeck et al., 2016). By the time the regulator intervenes, the target's emotional experience may or may not have fully unfolded. Therefore, an alternate categorization of strategies may be useful when they are applied extrinsically. We suggest that when helping others manage their emotions, a regulator can try to influence a target's emotional *experience* or a target's emotional *expression*. When trying to modify a target's situation (i.e., extrinsic situation modification), redirect their attention (i.e., extrinsic attentional deployment), or offer alternative ways to view the situation (i.e., extrinsic reappraisal), the regulator likely is doing so to change the target's emotional experience. However, when a regulator encourages a target not to express how they feel inside (i.e., extrinsic suppression), they are focused more on modifying the target's emotional expression, rather than their internal experience.

The utilization of different extrinsic ER strategies may have implications for the regulator's well-being (Cohen & Arbel, 2020). Extrinsic ER focused on helping someone else regulate their emotional experience requires some degree of mentalizing and empathy (Hallam et al., 2014). These behaviors may facilitate relationship building processes (Clark, 1983; Dunn & Schweitzer, 2005), which are integral to maintaining one's well-being. At the daily level, the regulator may be more able to pick up on the need to regulate and put more effort towards their regulation attempts in interactions with close others with whom they are motivated to maintain a good relationship. Since modifying an emotional experience takes more discernment than just trying to modulate an emotional response, regulators may be more likely to utilize emotion-focused extrinsic ER with close others, relative to non-close others. For instance, if a friend or partner is upset, a regulator could engage with the target to try and modify the situation that's causing negative emotions, direct their attention elsewhere, or offer alternative ways of viewing the situation to alter its emotional impact. These interactions may require prosocial responding on the part of the regulator, with these active emotional helping behaviors facilitating relationship building processes by fostering feelings of connectedness (Inagaki & Orehek, 2017) and reducing stress responses (Inagaki & Eisenberger, 2016). While researchers have begun to explore how regulators engage in experience-focused extrinsic ER, there is less research on how regulators might try and modulate a target's emotional responses in social situations. Since intrinsic suppression is disruptive to interpersonal communication (Butler et al., 2003), we speculate that extrinsic use of suppression could also be disruptive to social rapport and have negative consequences for the regulator. While extrinsic suppression may be an effective strategy to implement when a target is experiencing intensely negative emotions because it could help to de-escalate a situation, this strategy is negatively associated with emotional intelligence

(Little et al., 2012). This suggests that those who utilize more extrinsic suppression are also less able to recognize and manage emotions. As such, we predict that extrinsic suppression will be associated with poorer well-being indices. We posit that the use of different extrinsic ER strategies will be differentially associated with regulator well-being at the trait and state-level.

1.4 The Present Study

In this study we seek to understand the associations between extrinsic ER and the regulator's well-being, both globally and in daily life. To our knowledge, this would be the first study to examine extrinsic ER processes at the trait and state level, allowing us to compare how the effects of habitual use might differ from daily use and delineate within-person and between-person effects. In other words, using repeated measures data would allow us to look at variability within individuals (i.e., within-person effects) in addition to differences between individuals (i.e., between-person effects). Examining extrinsic ER at the daily level also provides an opportunity to gain initial insight into contextual predictors of such interpersonal behaviors. As such, a secondary aim of this study is to examine whether social and psychological aspects of context predict extrinsic ER strategy use in daily life. These aims will be addressed in a sample of undergraduates using a cross-sectional trait survey and experience sampling method (ESM) surveys.

Since research indicates that trait findings do not always map onto daily findings (Koval et al., in press), utilizing both methods with the same sample will allow us to examine both immediate and broader associations between extrinsic ER and well-being. Helping others regulate may be rewarding for the regulator and elicit feelings of social connectedness with others (Inagaki & Orehek, 2017), so we predict that greater use of extrinsic ER aimed at modifying a target's emotional experience will be associated with greater regulator well-being outcomes at the trait

level and state level (i.e., greater positive affect and lower negative affect). Since extrinsic suppression is associated with poorer abilities to detect and manage emotions (Little et al., 2012), and the inhibition of emotion expression is disruptive to interpersonal communication (Butler et al., 2003), we predict that extrinsic suppression will be associated with poorer regulator well-being at the trait and state level.

It is also important to understand the contexts in which these strategies are used in daily interactions with others. To better understand how extrinsic ER is used in daily life, we will also examine social contextual predictors of extrinsic ER strategy selection. Relationship closeness may influence the implementation of extrinsic ER because one may be more aware of a close other's emotional state and be more motivated to help them regulate during times of need to facilitate relationship building processes. As such, we predict that spending more time in interactions with close others (relative to non-close others only) will be associated with greater attempts to help others manage their emotional experiences (i.e., situation modification, attentional deployment, reappraisal).

2. Methods

2.1 Participants

Two hundred and two undergraduates were recruited to complete this two-part study with a baseline survey and experience sampling method (ESM) surveys. To participate, participants had to have a smartphone (for the ESM component) and not be traveling so that the software application could accurately send out notifications for the ESM surveys. We excluded 4 participants under the age of 18, resulting in a final sample size of 198 (M_{age} = 19.4, *SD* = 1.8; 64% women, 34% men, 1% non-binary, 0.5% genderqueer, 0.5% prefer not to answer). Of these participants, 3 did not complete the ESM portion because 1 dropped out of the study before the daily surveys began and the remaining individuals did not respond to any ESM surveys (0% compliance). Therefore, we had a final sample size of 195 for the ESM portion of the study. The sample was diverse in its racial/ethnic breakdown: 36% White, 34% East Asian, 15% Hispanic, 12% Black, 7% South Asian, 4% Southeast Asian, 2% Middle Eastern, 0.5% Other. Ten percent of our sample endorsed more than 1 of these categories.

2.2 Procedures

First, participants came into the laboratory and provided informed consent before completing a baseline survey assessing basic demographics, well-being, and individual differences in extrinsic ER strategy use, among other measures not relevant to the current study. After the baseline survey, an experimenter guided participants in downloading an application called SEMA3 on their smartphone, and then administered a tutorial of the ESM surveys so that participants could ask questions about survey items. Participants received a total of 98 short surveys over the following 14 days, which they received every 2-hours within a 12-hour window of the

participant's choice. Participants had 30 minutes from the initial notification to complete the survey. The survey expired if it was not completed within 30 minutes.

Participants were compensated course credits for their participation, which was prorated based on their ESM compliance rates. To receive full compensation the participants had to complete at least 80% of the total ESM surveys. In order to encourage high compliance, participants also received monetary compensation. They received 5 cents for each survey completed, with an extra $1 for 80% compliance, and those that completed more than 90% were entered into a drawing to win 1 of 2 $50 gift cards. Compliance was moderate, with an average completion rate of 73% (*SD* = 21%, range 1-99%). Participants were also given access to their data through the SEMA application upon completion of the surveys, allowing them to see their pattern of responses through the duration of the study.

2.3 Measures

First, participants came into the laboratory and provided informed consent before completing a baseline survey assessing basic demographics, well-being, and individual differences in extrinsic ER strategy use, among other measures not relevant to the current study. After the baseline survey, an experimenter guided participants in downloading an application called SEMA3 on their smartphone, and then administered a tutorial of the ESM surveys so that participants could ask questions about survey items. Participants received a total of 98 short surveys over the following 14 days, which they received every 2-hours within a 12-hour window of the participant's choice. Participants had 30 minutes from the initial notification to complete the survey. The survey expired if it was not completed within 30 minutes.

2.3.1 Baseline Trait Measures

Extrinsic ER

We used a modified version of the Interpersonal Emotion Management Questionnaire (IEMQ; Little et al., 2012) to assess habitual extrinsic ER strategy use. Participants reported their level of agreement on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) regarding their behaviors towards close others in situations when another is experiencing negative emotions. Four strategies were assessed, including situation modification (5 items; "I modify the elements of the situation that are having an undesired impact on others"; $\alpha = .85$), attentional deployment (5 items; "I refocus the conversation towards aspects of the situation that others should find more appealing"; $\alpha = .83$), reappraisal (5 items; "I try to influence the emotions of others by changing how they think about the situation they are in"; $\alpha = .81$), and expressive suppression (5 items; "I encourage others to keep their emotions to themselves"; $\alpha = .83$).

Well-being

To index subjective well-being, we created a composite of 2 trait measures: The Satisfaction with Life Scale (SWLS; Diener et al., 1985) and the Center for Epidemiological Studies Depression Scale-10 (CES-D; Andresen et al., 1994). For life satisfaction, participants reported the extent to which they disagreed or agreed with a series of 5 statements (e.g., "In most ways my life is close to my ideal") on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). For depressive symptoms, participants indicated how often they felt or behaved (e.g., "I felt depressed") for 10 items during the past week on a scale of 0 (*rarely of none of the time; less than 1 day*) to 3 (*most or all of the time; 5-7 days*). In line with the preregistered analysis plan, we created a well-being composite since their intercorrelation was moderately high ($r = -0.56$). Scores for life satisfaction and depressive symptoms were z-scored, and then depressive symptoms were reverse-scored before the two measures were averaged and z-scored again to

create 1 standardized measure for well-being. In exploratory analyses, we also examined separate effects for both life satisfaction and depressive symptoms.

2.3.2 ESM Measures

Current Affect

Participants reported the extent to which they were experiencing positive and negative emotions on a scale of 1 (*not at all*) to 7 (*extremely*). They were instructed to report their emotions at the time of the prompt using the following two items: "I felt positive emotions" and "I felt negative emotions."

Extrinsic ER

Individual items from the IEMQ (Little et al., 2012) were used to assess the same 4 strategies at the state level for extrinsic ER in daily life. For the ESM survey, we selected the single items with the highest average factor loading for each strategy subscale based on the original scale validation paper by Little and colleagues: situation modification ("I changed the situation to alter its emotional impact on them"; ICC 0.60), attentional deployment ("I focused their attention away from the troubling aspect of the problem"; ICC = 0.54), reappraisal ("I changed the meaning they were attaching to a situation"; ICC 0.55), and suppression ("I told them not to express their emotions"; ICC = 0.63). Participants reported how often they used each strategy to regulate others' emotions since the last prompt on a scale of 1 (*never*) to 7 (*all of the time*).

Social Context

Participants reported who they interacted with since the last prompt. They could either indicate that they did not interact with anyone or specify who they had interacted with (e.g., romantic partner, friend, stranger). Instances in which participants indicated that they did not interact with other people since the last prompt were coded as N/A as this indicated they did not have a social

interaction in which they could have engaged in extrinsic ER. For all other instances, we created a dummy variable to indicate whether the participant had spent time interacting with close others (or not) since the last prompt. Instances in which participants reported interacting with a romantic partner, friend, and/or family member were coded as interactions with a close other (1) while instances without any of these 3 selections were coded as interactions with non-close others only (0).

Situational Context

As an exploratory measure, we also asked participants to report on situational context using an ultra-brief measure of the Situational Eight DIAMONDS (Rauthmann & Sherman, 2016). The DIAMONDS is a validated scale that was developed in the personality literature to broadly assesses psychological situation characteristics and has been shown to be predictive of behavior (Rauthmann et al., 2014). This measure provides a single taxonomy with which researchers can begin to accumulate knowledge and compare findings about how aspects of the situation may predict behaviors in daily life. Participants rated the extent to which various characteristics applied to the situations they had been in since the last prompt on a scale of 1 (*never*) to 7 (*all of the time*). The Situational Eight DIAMONDS were captured using single-item measures developed and validated by Rauthman & Sherman (2016) specifically for work with ESM surveys: Duty ("work had to be done"), intellect ("deep thinking was required"), adversity ("somebody was being threatened, accused, or criticized"), mating ("potential romantic partners were present"), pOsitivity ("the situation was pleasant"), negativity ("the situation contained negative feelings), deception ("somebody was being deceived), and sociality ("social interactions were possible or required").

2.4 Analysis Plan

This study, including all hypotheses and the analysis plan, was preregistered on the Open Science Framework (OSF) prior to data analysis (https://osf.io/vy3pz/). All analyses were conducted using the statistical program R (Version 4.1.2). To examine the bivariate relationships between extrinsic ER and well-being, we first calculated zero-order correlations between all trait measures (Table 1). We utilized multiple regression to predict subjective well-being from trait-level extrinsic ER, with all 4 strategies (i.e., situation modification, attentional deployment, reappraisal, and suppression) as simultaneous predictors, and then examined gender effects in exploratory analyses by first adding a dummy-coded gender variable (0 = man, 1 = woman) as a covariate, then another model in which we added gender as a moderator.

Since the primary variable of interest from the daily surveys was extrinsic ER, only instances in which participants reported having interacted with someone since the last prompt (71% of prompts) were included for analysis, since an interaction is required for extrinsic ER. All participants reported having at least 1 social interaction, so our sample size remained the same after excluding prompts with no interactions.

To account for the nested structure of the ESM data (i.e., surveys nested within individuals), we used multi-level modeling (MLM) procedures to test the hypothesized effects involving daily extrinsic ER. Analyses were run as random effects models with random intercepts for each participant and random slopes for each within-person effect. Using MLM, we predicted positive affect (PA) and negative affect (NA) in separate models, separated into within-person and between-person components of the extrinsic ER predictors by person-mean centering to obtain within-person effects and grand-mean centering the person-means to get between-person effects.

To account for social context, we predicted state use of extrinsic ER strategies in separate models from the proportion of time in which they interacted with close others, which was calculated from a dummy-coded variable indicating whether an individual's interactions had involved a close other (1) or not (0). These values were then person-mean centered to obtain within-person effects and then the person-means were grand-mean centered to obtain between-person effects. Higher social interaction variables represented a greater proportion of interactions where close others were present, with zero representing the average proportion of time spent interacting with close others.

As seen in Figure 1, the state extrinsic ER variables (i.e., ESM ratings of situation modification, attentional deployment, reappraisal, suppression) were highly skewed. There was a high proportion of ESM surveys where participants indicated no extrinsic ER strategy use (60% of prompts containing social interactions). Due to the skewed distribution of these outcome variables, we had to deviate from our pre-registered analysis plan in two ways because MLM model assumptions were violated. First, we utilized hurdle models for analyses where state extrinsic ER was the outcome because this class of models helps to account for data with excess zeros. Hurdle models are 2-part models that specify one process for zero-counts of the outcome variable (i.e., a score of 1 on the state extrinsic ER variables), and a second conditional model for positive counts (i.e., scores of 2-7 on the state extrinsic ER variables). Zero-count models predict the probability of a zero outcome, or no regulation occurring. The output can be converted to an odds ratio (OR) representing the odds of a zero outcome (e.g., no regulation) given the predictor, with an OR greater than 1 indicating a likelihood of no regulation, while an OR lower than 1 indicates a likelihood of regulation occurring. The conditional or positive count model only considers positive counts, or the extent of extrinsic regulation attempts within instances that an

individual reported using an extrinsic ER strategy. The output of the positive count models can be converted to an incident rate ratio (IRR), with an IRR of 1 indicating that the rate of regulation occurring does not differ based on the predictors of the model, while a value greater than 1 would indicate that as the predictor increases, the rate of regulation is increases, and an IRR below 1 would indicate that as the predictor increases, the rate of regulation occurring decreases. Hurdle models were used to examine the associations between the social context (e.g., time spent with close others) and extrinsic ER strategy use (i.e., the likelihood that the predicted strategy was not used and, in cases where the strategy was deployed, the extent to which it was used). Finally, in exploratory analyses we examined whether situational context predicted extrinsic ER strategy use in daily life. Hurdle models were used again due to the skewed nature of the extrinsic ER variables (Figure 1). Model fit analyses revealed that the truncated Poisson distribution fit the models best, and were thus used in our hurdle model analyses. The second deviation from the preregistered plan was required for models where state extrinsic ER strategies were predicting daily affect outcomes. We attempted to utilize a hurdle approach in these models such that each strategy was separated into a dummy-coded variable (0 = no regulation and 1 = regulation) and a continuous variable to represent instances of regulation. However, these models did not converge so in these MLM models, the strategies were simply dichotomized such that 0 = no regulation and 1 = regulation since including them as continuous predictors violated normality assumptions.

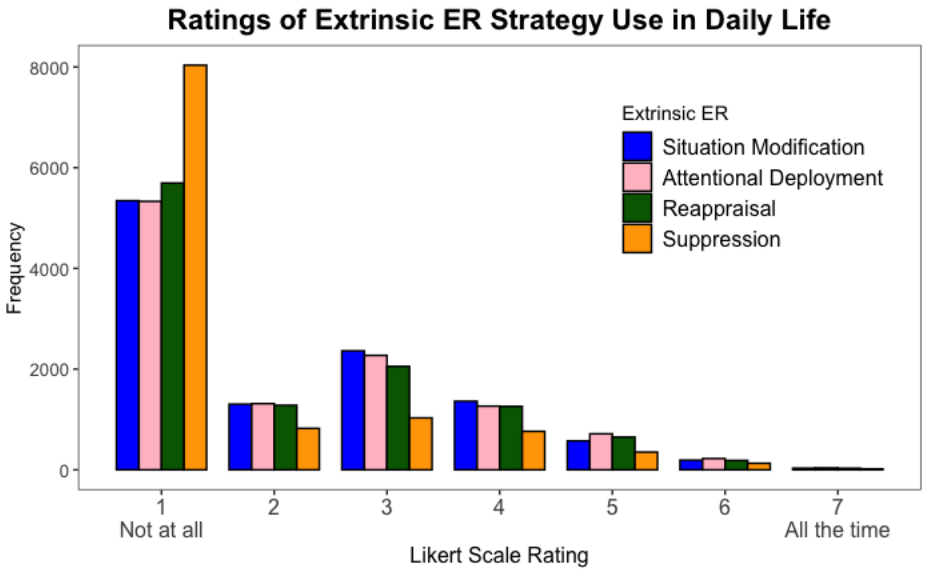

Figure 1.

Frequency of Likert scale ratings for extrinsic ER across all participants in experience sampling surveys where social interactions were reported in momentary surveys.

3: Results

3.1 Descriptive Statistics and Correlations

Descriptive statistics, including the means, standard deviations, and correlations between trait variables are shown in Table 1. We did not find any statistically significant correlations between any of the extrinsic ER strategies and well-being outcomes. The experience-focused extrinsic ER strategies (i.e., situation modification, attentional deployment, reappraisal) were endorsed more than the expression-focused extrinsic ER strategy of suppression. In 60% of prompts in which a social interaction was reported, participants reported using at least one of the extrinsic ER strategies, with strategies targeting emotional experience (i.e., situation modification, attentional deployment, reappraisal) being used more than the one targeting emotional expression (i.e., suppression).

Table 1

Means, Standard Deviations, and Pearson Correlations of Trait-Level Variables

Variables	*M*	*SD*	1	2	3	4	5	6
1. Well-Being (std)	0.00	1.00						
2. Life Satisfaction	4.93	1.21	.88**					
3. Depressive Symptoms	10.05	5.18	-.88**	-.56**				
4. Situation Modification	4.91	1.02	-.11	-.10	.09			
5. Attentional Deployment	4.72	1.21	-.05	-.05	.04	.31**		
6. Reappraisal	4.50	1.25	.03	.05	.00	.12	.31**	
7. Suppression	1.54	0.85	-.00	-.02	-.01	-.07	-.01	.09

Note. M and *SD* are used to represent mean and standard deviation, respectively. * $p < .05$. ** $p < .01$.

3.2 Trait-level: Does Extrinsic ER Predict Well-Being and Daily Affect?

Multiple regression analyses revealed that habitual extrinsic ER strategy use did not predict individual well-being (see Table 2). None of the extrinsic ER strategies were significantly associated with trait well-being. We also examined whether extrinsic ER was associated with life satisfaction and depressive symptoms, and again found only null effects.

As preregistered, we also ran exploratory analyses examining whether trait-level use of extrinsic ER predicted daily affect (see Table 3). Multi-level analyses revealed that both trait situation modification and trait suppression were associated with higher state negative affect (situation modification: $b = 0.12$, $p = .045$; suppression: $b = 0.17$, $p = .01$). Trait use of extrinsic ER was not predictive of state positive affect for any of the strategies (ps > .075).

3.2.1 Gender

In exploratory analyses we examined whether gender might affect the links between extrinsic ER and regulator well-being since prior research suggests there may be gender differences in ER (Nolen-Hoeksema & Aldao, 2011). First, we ran t-tests to determine whether there were gender differences in trait-level use of extrinsic ER strategies (see Table 4). There were no gender differences in trait-level use of situation modification, attentional deployment, or reappraisal (ps = .082-.449), but men reported greater use of extrinsic suppression than women, $t(192) = 3.19$, $p = .002$, d = 0.48. Because we found a gender difference in the use of one of the extrinsic ER strategies, we added gender as a covariate in our multiple regression models examining the association between extrinsic ER and well-being outcomes, which did not change our findings (see Table 3). Finally, we added gender as a moderator. There was only a significant gender by reappraisal interaction in predicting depressive symptoms ($\beta = 0.43$, $p = .011$). Simple slopes

analyses revealed that extrinsic reappraisal was associated with lower depressive symptoms for men, b = -1.25, t = -2.14, p = .03, but not women b = 0.54, t = 1.45, p = .15. These effects held when controlling for gender as a covariate. We did not find any other statistically significant gender interactions.

Table 2

Multiple Regression Predicting Well-being Outcomes as a Function of Trait Extrinsic ER (and Gender)

	Well-being			**Life Satisfaction**			**Depressive Symptoms**		
	β	95%CI	*p*	β	95%CI	*p*	β	95%CI	*p*
Extrinsic ER Model									
Situation Modification	-0.11	[-0.26, 0.04]	0.155	-0.10	[-0.25, 0.05]	0.185	0.09	[-0.06, 0.24]	0.238
Attentional Deployment	-0.03	[-0.18, 0.12]	0.702	-0.03	[-0.19, 0.12]	0.663	0.02	[-0.14, 0.17]	0.811
Reappraisal	0.05	[-0.10, 0.20]	0.506	0.07	[-0.07, 0.22]	0.326	-0.02	[-0.16, 0.13]	0.843
Suppression	-0.01	[-0.16, 0.13]	0.844	-0.03	[-0.17, 0.11]	0.671	-0.01	[-0.15, 0.14]	0.941
Gender Covariate Model									
Situation Modification	-0.13	[-0.28, 0.02]	0.097	-0.10	[-0.25, 0.05]	0.194	0.13	[-0.02, 0.28]	0.098
Attentional Deployment	-0.01	[-0.17, 0.15]	0.894	-0.04	[-0.20, 0.12]	0.621	-0.02	[-0.18, 0.14]	0.798
Reappraisal	0.04	[-0.12, 0.19]	0.634	0.07	[-0.08, 0.22]	0.384	0.00	[-0.15, 0.15]	0.984
Suppression	-0.02	[-0.17, 0.13]	0.789	0.01	[-0.14, 0.16]	0.932	0.04	[-0.11, 0.19]	0.576
Gender	-0.17	[-0.49, 0.15]	0.288	0.11	[-0.21, 0.42]	0.505	**0.40**	[0.09, 0.72]	0.012
Gender Interaction Model									
Situation Modification	-0.15	[-0.43, 0.13]	0.287	-0.14	[-0.42, 0.14]	0.322	0.13	[-0.15, 0.40]	0.365
Attentional Deployment	-0.10	[-0.42, 0.21]	0.512	-0.08	[-0.40, 0.24]	0.615	0.10	[-0.20, 0.41]	0.507
Reappraisal	0.25	[-0.03, 0.53]	0.084	0.14	[-0.15, 0.42]	0.340	**-0.30**	[-0.58, -0.02]	0.034
Suppression	-0.16	[-0.48, 0.17]	0.339	0.10	[-0.23, 0.43]	0.561	**0.37**	[0.05, 0.69]	0.023
Gender	-0.09	[-0.32, 0.14]	0.451	-0.07	[-0.30, 0.16]	0.558	0.09	[-0.14, 0.31]	0.451
Situation Modification X Gender	0.04	[-0.29, 0.38]	0.801	0.06	[-0.28, 0.40]	0.724	-0.02	[-0.34, 0.31]	0.925
Attentional Deployment X Gender	0.12	[-0.25, 0.48]	0.521	0.06	[-0.31, 0.42]	0.768	-0.15	[-0.51, 0.20]	0.397
Reappraisal X Gender	-0.30	[-0.64, 0.03]	0.074	-0.11	[-0.44, 0.23]	0.533	**0.43**	[0.10, 0.76]	0.011
Suppression X Gender	0.13	[-0.18, 0.43]	0.413	0.13	[-0.17, 0.44]	0.399	-0.09	[-0.39, 0.21]	0.541

Note. β = standardized coefficients. 95%CI = 95% confidence intervals. Bolded text refers to statistically significant effects as indicated by *p* < .05

Table 3

Multi-level Models Predicting State Affect as a Function of Trait-Level Extrinsic ER (and Gender)

	Positive Affect			**Negative Affect**		
Predictors	Estimates	95%CI	*p*	Estimates	95%CI	*p*
Extrinsic ER Only Model						
(Intercept)	3.77			2.53		
Situation Modification	0.09	[-0.06, 0.23]	0.236	**0.12**	[0.00, 0.23]	0.045
Attentional Deployment	0.05	[-0.07, 0.18]	0.410	0.01	[-0.09, 0.11]	0.893
Reappraisal	0.07	[-0.05, 0.19]	0.248	0.05	[-0.04, 0.15]	0.256
Suppression	-0.12	[-0.29, 0.05]	0.175	**0.17**	[0.04, 0.31]	0.010
Gender Covariate Model						
(Intercept)	3.66			2.38		
Situation Modification	0.10	[-0.05, 0.26]	0.176	**0.15**	[0.03, 0.26]	0.014
Attentional Deployment	0.04	[-0.09, 0.17]	0.552	-0.01	[-0.12, 0.09]	0.798
Reappraisal	0.08	[-0.05, 0.20]	0.223	0.07	[-0.03, 0.16]	0.157
Suppression	-0.10	[-0.28, 0.08]	0.267	**0.19**	[0.05, 0.33]	0.008
Gender	0.17	[-0.15, 0.49]	0.302	0.22	[-0.02, 0.47]	0.075
Gender Interaction Model						
(Intercept)	3.69			2.42		
Situation Modification	-0.02	[-0.30, 0.27]	0.915	0.09	[-0.12, 0.30]	0.402
Attentional Deployment	0.12	[-0.16, 0.40]	0.396	-0.01	[-0.23, 0.20]	0.909
Reappraisal	0.11	[-0.14, 0.35]	0.386	-0.06	[-0.24, 0.13]	0.549
Suppression	-0.09	[-0.37, 0.19]	0.521	0.09	[-0.12, 0.31]	0.384
Gender	0.14	[-0.20, 0.48]	0.414	0.19	[-0.07, 0.44]	0.148
Sit Modification X Gender	0.17	[-0.16, 0.51]	0.316	0.07	[-0.18, 0.33]	0.583
Attn Deployment X Gender	-0.11	[-0.43, 0.21]	0.511	0.01	[-0.23, 0.26]	0.922
Reappraisal X Gender	-0.05	[-0.34, 0.23]	0.717	0.17	[-0.05, 0.39]	0.122
Suppression X Gender	-0.02	[-0.39, 0.35]	0.912	0.15	[-0.13, 0.43]	0.295

Note. All extrinsic ER strategies were grand-mean centered prior to analysis. Estimates are unstandardized coefficients. Bold text refers to statistically significant findings, as indicated by $p < .05$

Table 4

Group Differences in Trait Extrinsic ER by Gender

Variable	M_{men}	M_{women}	*t*	*p*	*d*
Situation Modification	5.08	4.82	1.65	0.100	0.25
Attentional Deployment	4.53	4.85	-1.75	0.082	-0.26
Reappraisal	4.6	4.46	0.76	0.449	0.11
Suppression	1.79	1.40	3.19	0.002	0.48

Note. M_{men} and M_{women} represent group means for men and women, respectively. *t* = t-statistic, *p* = p- value, *d* = Cohen's d.

3.3 State-level: Does Extrinsic ER Predict State Affect?

There were within and between person effects of state extrinsic ER strategy use on positive and negative affect in daily life. Results can be found in Table 5. There was a within-person effect of suppression on state negative affect ($b = 0.17$, $p = 0.003$), suggesting that people experienced more negative affect on occasions when they had engaged in more extrinsic suppression than usual. We also found between-person effects of suppression on positive affect ($b = -0.63$, $p = 0.042$) and negative affect ($b = 0.86$, $p < 0.001$); people that engaged in more extrinsic suppression in daily life reported lower positive affect and greater negative affect than people who engaged in less extrinsic suppression. Contrary to our hypothesis, there was a between-person effect of reappraisal on negative affect indicating that people who engaged in more extrinsic reappraisal also reported greater negative affect ($b = 1.77$, $p = .003$). As predicted, there was a negative between-person effect of attentional deployment on negative affect ($b = -1.20$, $p = .036$) indicating that people who used this strategy more reported less negative affect in daily life.

Table 5

Multi-level Models Predicting State Affect from Extrinsic ER

	Positive Affect			**Negative Affect**		
Predictors (State)	Estimates	95%CI	*p*	Estimates	95%CI	*p*
(Intercept)	3.77			2.55		
Situation Modification (WI)	-0.02	[-0.13, 0.09]	0.773	0.06	[-0.02, 0.15]	0.126
Situation Modification (BW)	0.06	[-1.03, 1.15]	0.911	-0.14	[-0.84, 0.55]	0.686
Attentional Deployment (WI)	0.01	[-0.09, 0.11]	0.827	0.07	[-0.03, 0.17]	0.149
Attentional Deployment (BW)	1.29	[-0.33, 2.91]	0.118	**-1.20**	[-2.31, -0.08]	0.036
Reappraisal (WI)	0.04	[-0.07, 0.14]	0.512	0.07	[-0.03, 0.16]	0.174
Reappraisal (BW)	-1.28	[-3.04, 0.48]	0.153	**1.77**	[0.59, 2.95]	0.003
Suppression (WI)	-0.09	[-0.21, 0.02]	0.103	**0.17**	[0.06, 0.28]	0.003
Suppression (BW)	**-0.63**	[-1.23, -0.02]	0.042	**0.86**	[0.47, 1.26]	<0.001

Note. Extrinsic ER strategies were dummy coded prior to analysis, where 0 = no regulation, 1 = regulation. Values were then centered at the person-level to obtain within-person effects, and the person-level means centered to obtain between-person effects. WI = within-person, BW = between-person. Estimates represent unstandardized coefficients. Bold text indicates statistically significant effects where $p < .05$.

3.4 Does Social Context Predict Extrinsic ER Strategy Use in Daily Life?

We found that features of the social context predicted extrinsic ER strategy use in daily life. The results of the hurdle models (Table 6) indicated that there were both within- and between-person effects of social context on whether participants used situation modification, attentional deployment, and reappraisal; there were no effects of social context on whether suppression was used. In terms of within-person effects, when people reported spending a greater proportion of time in interactions involving close-others, they were more likely to engage in situation modification (IRR = 0.71, $p < 0.001$), attentional deployment (IRR = 0.61, $p < 0.001$), and reappraisal (IRR = 0.62, $p < 0.001$), but there were no differences in the likelihood of suppression. There was also a between-person of effect of social context on likelihood of using extrinsic strategies targeting emotional experience: People who tended to spend more time around close others were more likely to engage in situation modification (IRR = 0.64, $p = 0.003$), attentional deployment (IRR = 0.61, $p < 0.001$), and reappraisal (IRR = 0.52, $p < 0.001$). There was not a between-person effect of social context on suppression.

When regulation did occur, people engaged in less suppression when they spent a greater proportion of time in interactions with close others (IRR = 0.78, $p = 0.001$), showing a within-person effect. There was also a between-person effect of social context, such that people who spent more time with close others engaged in less situation modification (IRR = 0.51, $p = 0.018$) and suppression (IRR = 0.36, $p = 0.002$), when they did end up using these strategies.

3.5 Does Situational Context Predict Extrinsic ER Strategy Use in Daily Life?

As an exploratory measure, we also examined the association between situational context and state extrinsic ER. Results can be found in Table 7. Contexts which regulators deemed unfavorable (i.e., negativity, adversity, deception) yielded a greater likelihood of regulation. Negativity was associated with an increased likelihood of extrinsic ER and greater time and effort on their regulatory attempts across all strategies. Another context that yielded a similar pattern of behavior was the presence of current or potential romantic partners (i.e., mating). The presence of potential or current romantic partners was associated with an increased likelihood of extrinsic ER and greater efforts towards regulation.

There was a positive association between extrinsic ER strategy use and the presence of potential romantic partners. When it came to situations requiring deep thought (i.e., intellect), we found between-person effects for all strategies, indicating that people who engaged in a greater proportion of their time engaged in deep thought were also more likely to engage in extrinsic ER relative to those who spent less time engaged in deep thought. Duty was generally associated with an increase likelihood of extrinsic regulation. On the other hand, situations of positivity were associated with a lower likelihood of engaging in extrinsic ER, but once it was implemented, participants reported spending more time and effort helping others regulate. Finally, when participants reported more situations in which social interactions were necessary, they generally reported a greater likelihood of extrinsic regulation.

Table 6

Hurdle Models Predicting Extrinsic ER as a Function of Social Context (Close Others)

	Situation Modification				**Attentional Deployment**				**Reappraisal**				**Suppression**			
	Zero-Count		Positive Count		Zero-Count		Positive Count		Zero-Count		Positive Count		Zero-Count		Positive Count	
Predictors	**OR**	**95%CI**	**IRR**	**95%CI**	**OR**	**95%CI**	**IRR**	**95%CI**	**OR**	**95%CI**	**IRR**	**95%CI**	**OR**	**95%CI**	**IRR**	**95%CI**
Close:Non-Close (WI)	**0.71**	[0.62, 0.81]	0.90	[0.80, 1.01]	**0.61**	[0.54, 0.70]	1.04	[0.92, 1.18]	**0.62**	[0.54, 0.71]	0.99	[0.87, 1.12]	0.93	[0.80, 1.07]	**0.78**	[0.67, 0.91]
Close:Non-Close (BW)	**0.64**	[0.48, 0.86]	**0.51**	[0.29, 0.89]	**0.52**	[0.39, 0.70]	0.79	[0.48, 1.31]	**0.52**	[0.38, 0.69]	0.65	[0.40, 1.05]	1.36	[0.99, 1.86]	**0.36**	[0.18, 0.69]

Note. Hurdle models using truncated Poisson distributions. Close:Non-Close represents the proportion of time spent interacting with close others present relative to interactions where close others were not present. WI = within person effects, BW = between-person effects, IRR = incidence rate ratios, OR = odds ratio, 95%CI = 95% confidence intervals. Bolded text reference statistically significant associations, as indicated by 95% confidence intervals that do not cross 1.

Table 7

Hurdle Models Predicting Extrinsic ER Strategy as a Function of Situational Context

	Situation Modification				**Attentional Deployment**				**Reappraisal**				**Suppression**			
	Zero-Count		Positive Count		Zero-Count		Positive Count		Zero-Count		Positive Count		Zero-Count		Positive Count	
	OR	**95%CI**	**IRR**	**95%CI**	**OR**	**95%CI**	**IRR**	**95%CI**	**OR**	**95%CI**	**IRR**	**95%CI**	**OR**	**95%CI**	**IRR**	**95%CI**
Duty Model																
Duty (WI)	1.01	[0.99, 1.04]	**1.03**	[1.00, 1.05]	1.01	[0.99, 1.04]	1.02	[1.00, 1.04]	1.01	[0.98, 1.04]	1.03	[1.01, 1.05]	1.03	[1.00, 1.06]	1.07	[1.02, 1.12]
Duty (BW)	**0.69**	[0.66, 0.72]	**1.21**	[1.12, 1.31]	0.75	[0.72, 0.79]	1.11	[1.04, 1.19]	0.76	[0.73, 0.80]	1.12	[1.05, 1.21]	0.86	[0.82, 0.90]	1.15	[1.03, 1.29]
Intellect Model																
Intellect (WI)	0.98	[0.95, 1.01]	**1.06**	[1.03, 1.08]	0.99	[0.96, 1.02]	**1.03**	[1.01, 1.06]	0.98	[0.95, 1.01]	**1.07**	[1.04, 1.09]	0.99	[0.96, 1.02]	**1.10**	[1.05, 1.15]
Intellect (BW)	**0.48**	[0.46, 0.50]	**1.25**	[1.16, 1.34]	**0.54**	[0.51, 0.56]	**1.17**	[1.10, 1.24]	**0.53**	[0.51, 0.55]	**1.19**	[1.11, 1.26]	**0.55**	[0.53, 0.58]	**1.28**	[1.16, 1.42]
Adversity Model																
Adversity (WI)	**0.77**	[0.72, 0.81]	**1.10**	[1.07, 1.13]	**0.79**	[0.74, 0.83]	**1.08**	[1.06, 1.11]	**0.79**	[0.75, 0.84]	**1.10**	[1.07, 1.13]	**0.74**	[0.70, 0.78]	**1.13**	[1.09, 1.17]
Adversity (BW)	**0.21**	[0.20, 0.23]	**1.28**	[1.20, 1.35]	**0.24**	[0.23, 0.26]	**1.24**	[1.18, 1.30]	**0.24**	[0.22, 0.25]	**1.25**	[1.19, 1.31]	**0.13**	[0.12, 0.14]	**1.42**	[1.34, 1.50]
Mating Model																
Mating (WI)	**0.84**	[0.80, 0.87]	**1.07**	[1.04, 1.10]	**0.84**	[0.81, 0.88]	**1.06**	[1.04, 1.09]	**0.85**	[0.81, 0.88]	**1.07**	[1.04, 1.09]	**0.87**	[0.83, 0.90]	**1.13**	[1.08, 1.17]
Mating (BW)	**0.42**	[0.40, 0.44]	**1.23**	[1.16, 1.31]	**0.44**	[0.42, 0.46]	**1.18**	[1.12, 1.25]	**0.41**	[0.40, 0.43]	**1.22**	[1.15, 1.28]	**0.24**	[0.23, 0.26]	**1.33**	[1.25, 1.43]
pOsitivity Model																
pOsitivity (WI)	1.00	[0.97, 1.03]	**1.06**	[1.03, 1.10]	0.98	[0.95, 1.01]	**1.07**	[1.04, 1.10]	0.98	[0.95, 1.01]	**1.05**	[1.02, 1.08]	1.01	[0.98, 1.05]	**1.10**	[1.06, 1.15]
pOsitivity (BW)	**1.20**	[1.15, 1.25]	1.07	[0.98, 1.16]	**1.19**	[1.15, 1.24]	1.06	[0.99, 1.14]	**1.23**	[1.19, 1.28]	1.05	[0.97, 1.13]	**1.28**	[1.23, 1.34]	**1.17**	[1.04, 1.31]
Negativity Model																
Negativity (WI)	**0.90**	[0.87, 0.94]	**1.07**	[1.04, 1.10]	**0.89**	[0.86, 0.92]	**1.05**	[1.02, 1.08]	**0.88**	[0.85, 0.91]	**1.06**	[1.04, 1.09]	**0.94**	[0.90, 0.97]	**1.13**	[1.08, 1.18]
Negativity (BW)	**0.40**	[0.38, 0.42]	**1.33**	[1.24, 1.43]	**0.41**	[0.39, 0.43]	**1.24**	[1.17, 1.33]	**0.40**	[0.38, 0.42]	**1.29**	[1.21, 1.38]	**0.34**	[0.32, 0.36]	**1.44**	[1.32, 1.57]
Deception Model																
Deception (WI)	**0.68**	[0.64, 0.73]	**1.11**	[1.08, 1.14]	**0.72**	[0.68, 0.77]	**1.11**	[1.08, 1.14]	**0.72**	[0.67, 0.76]	**1.10**	[1.07, 1.14]	**0.66**	[0.63, 0.71]	**1.15**	[1.10, 1.20]
Deception (BW)	**0.18**	[0.17, 0.20]	**1.29**	[1.21, 1.36]	**0.22**	[0.20, 0.23]	**1.25**	[1.19, 1.31]	**0.21**	[0.19, 0.22]	**1.25**	[1.20, 1.31]	**0.12**	[0.12, 0.13]	**1.42**	[1.35, 1.49]
Sociality Model																
Sociality (WI)	**0.94**	[0.92, 0.97]	**1.07**	[1.04, 1.09]	**0.94**	[0.91, 0.96]	**1.04**	[1.02, 1.07]	**0.94**	[0.92, 0.97]	**1.06**	[1.03, 1.08]	1.01	[0.98, 1.04]	**1.14**	[1.08, 1.19]
Sociality (BW)	**0.94**	[0.90, 0.97]	**1.13**	[1.04, 1.23]	**0.95**	[0.92, 0.99]	**1.11**	[1.03, 1.20]	0.99	[0.95, 1.03]	**1.09**	[1.01, 1.17]	**1.28**	[1.22, 1.34]	1.11	[0.99, 1.24]

Note. WI = within-person effects, BW = between-person effects, IRR = incident rate ratio, OR = odds ratio, 95%CI = 95% confidence intervals. Bold text refers to statistically significant associations as indicated by 95% confidence intervals that do not cross 1.

4. Discussion

In this study, our aim was to examine how extrinsic ER strategies use is associated with regulator well-being, and which contextual features predict their use in daily life. We predicted that greater use of experience-focused extrinsic ER strategies would be associated with greater regulator well-being at the trait and state level. However, these hypotheses were largely not supported by the data. Daily use of extrinsic suppression was associated with poorer regulator affect in daily life. As predicted, there was a positive association between time spent interacting with close others and use of extrinsic ER strategies aimed at modifying a target's emotional experience (i.e., situation modification, attentional deployment, reappraisal).

4.1 Extrinsic ER Strategy Use and Well-Being

While trait extrinsic ER was not consistently predictive of trait well-being outcomes, daily use of some extrinsic ER strategies predicted daily affect. Suppression was associated with lower positive affect and greater negative affect, supporting the notion that expressive suppression is associated with a worse emotional profile (Gross & John, 2003) and has a negative impact on relationship building processes (Chervonsky & Hunt, 2017). A regulator may experience positive affect after extrinsic ER if they deem their attempts to help others regulate as "good", if they are successful in their attempts, or if they feel that they were freely able to provide the support (Inagaki & Orehek, 2017). Poor implementation of extrinsic ER, on the other hand, could increase the regulator's stress and increase negative affect. So, what is "good" extrinsic ER versus "bad" extrinsic ER? The limited associations between extrinsic ER and affect suggests that other factors need to be considered. Namely, the response of the target may influence the regulator's affect after a regulatory attempt (Zaki & Williams, 2013). The fact that daily use of

extrinsic ER was predictive of daily affect suggests that the regulators are more affected by extrinsic ER in the short-term. Overall, it may be the significance of the emotional interaction rather than the frequency that is predictive of more stable individual differences in the regulator. Also, we may need to investigate relational outcomes more so than regulator well-being independent of the relational context. Future research could examine relationship quality as a function of extrinsic ER strategy use and measure other aspects of extrinsic ER, such as frequency and perceptions of effort (i.e., how hard did you work to help others regulate) to disentangle which aspects of extrinsic might contribute more to regulator outcomes.

Contrary to our hypotheses, trait-level use of extrinsic ER strategies was not generally predictive of regulator trait well-being. The one exception was that trait-level extrinsic reappraisal was associated with lower depressive symptoms for men (but not women). This finding supports previous research suggesting that there are gender differences in emotion regulation, with men tending to be less aware of and engaging with their emotions than women (Nolen-Hoeksema & Aldao, 2011). Our research extends these findings to the consequences of extrinsic regulation for the regulator, suggesting that men who engage in more extrinsic reappraisal experience fewer depressive symptoms. Extrinsic reappraisal is a particularly involved extrinsic ER strategy that requires the regulator to mentalize, empathize, and engage with the target (Hallam et al., 2014) and may thus foster interpersonal closeness. This finding may indicate that men who use this strategy have stronger relational bonds because they provide more engaging emotional support to others. On the other hand, extrinsic reappraisal may help them develop their own reappraisal abilities, allowing them to manage their depressive symptoms more effectively over time (Doré et al., 2017). Gender did not moderate the effect of any other extrinsic ER strategies (i.e., situation modification, attentional deployment, suppression). While we cannot determine

causality due to the cross-sectional nature of the data, these findings suggest that using reappraisal to manage others' emotions may be uniquely beneficial for men in protecting them against depressive symptoms.

Although null effects should be interpreted with caution, there are several reasons why trait extrinsic strategy use may not have shown many associations with trait well-being. The decision to engage in extrinsic ER requires active responding in a particular situation. Those who are particularly effective regulators may be skilled at adapting their responses to the situation at hand (Doré et al., 2016), meaning they are able to implement the most effective strategy based on the context, rather than inflexibly relying on a particular strategy or set of strategies when helping others regulate (Haines et al., 2016). As such, there would not be a strong association between their own well-being and their responding to others in times of need, at least not at a strategy-specific level. Perhaps it would make more sense to examine the link between extrinsic ER and well-being from an effort perspective (Matthews et al., 2021). An alternate explanation is that individuals vary in their responding to others. There is research suggesting that people perceive others as having distinct regulatory functions (Cheung et al., 2015), reaching out to specific people for help with specific regulatory needs. While this research focused on intrinsic regulatory processes, these associations may also translate to extrinsic processes, such that a regulator might respond to different interaction partners with different regulatory strategies based on the nature of their relationship or the individual differences of the target. For example, a regulator might help a friend reappraise an upsetting situation at work, but help a romantic partner modify their situation when they have a bad day in order to get their minds off of the situation and decrease their negative affect. It is also possible that variability in extrinsic ER strategy use across relationships is more important. One study found that individuals who varied

extrinsic ER strategy use across relationships had less close relationships and lower positive mood than those who were more consistent in their extrinsic ER (Niven et al., 2012). These findings suggest that researchers need to move beyond focusing on mean-levels of strategy use and consider variability across contexts. Future research is needed to examine relationship-specific extrinsic ER strategy use and regulator well-being.

4.2 Contextual Predictors of Extrinsic ER Strategy Use

We found support for our hypothesis that interactions involving close others would be associated with greater use of all experience-focused extrinsic ER strategies. The hurdle models used in our analyses allowed us to examine the likelihood of regulation occurring versus not occurring (zero-count models), in addition to patterns of regulatory effort once a strategy was implemented (positive count models). We found both within-person and between-person effects such that time spent in interactions involving close others was associated with a greater likelihood of situation modification, attentional deployment, and reappraisal in daily life, and greater time and effort helping others regulate, relative to people who spent a greater proportion of time in interactions involving only non-close others. Interestingly, we found that while people were more likely to engage in situation modification with close others, they spent less time and effort utilizing this strategy with them. While this may seem counterintuitive at first, it may be because this strategy does not take as much time or effort to implement with close others because they know the target better. Situation modification with non-close others might take more trial and error, resulting in a greater amount of time and effort trying to help with situation modification. These findings highlight the differences in implementation of extrinsic ER in daily life, such that choosing to engage in extrinsic ER is not always predictive of how much time and effort one actually puts toward their regulation efforts.

We did not have a hypothesis about extrinsic suppression use in daily life and social context since research on this subject is limited. In our findings, closeness was not linked to the likelihood of using suppression, indicating that participants were no more or less likely to implement this strategy based on the closeness of their relationship with their interaction partners. However, when suppression was utilized, it was associated with a lower proportion of time spent in interactions with close others. That is, when people spent a greater proportion of time in interactions involving only non-close others, they reported greater time and effort in extrinsic suppression. People who spent a greater proportion of their time in interactions involving close others also reported lower use of suppression. These findings suggest that when suppression is utilized in social interactions, it occurs more during interactions only involving non-close others. These findings are in line with intrinsic ER research showing that expressive suppression of one's own emotions is more common in interactions with non-close others, relative to interactions with close others (English et al., 2017). While we cannot tie specific instances of extrinsic ER with a specific interaction partner, our findings suggest that the identity of the target influences regulator behavior. These findings would align with the notion that there is variability in the strategies people use to help others manage their emotions (Niven et al., 2012). Additional research examining the extent of this variability is necessary to more directly investigate this hypothesis.

As an exploratory measure, we also examined the situational predictors of extrinsic ER strategy use in daily life. We generally found greater likelihood of extrinsic ER being used in situations perceived to involve more negative emotions, deception, and adversity. Negativity was also associated with greater effort towards regulatory attempts. Situations perceived to involve more duty and intellect were associated with a lower likelihood of extrinsic ER, but increased time

spent regulating when it did occur. These findings suggest that while situations that contain more negative emotions and cognitive demand for the regulator may make them less likely to implement extrinsic ER with others, but when they do, they use more of their own resources to help others through emotional episodes. Situations perceived to be higher in positivity, on the other hand, were associated with a lower likelihood of extrinsic regulation. These findings support the notion that people feel less of a need to regulate when negative emotions are not the primary concern (Reeck et al., 2016).

4.3 Limitations and Next Steps

One limitation of our research is that we could not tie specific instances of regulation with a specific interaction partner or situational context. Since participants were asked to report on their interactions since the last prompt, we could not tie these features together. Future research should attempt to do so. One way this could be done is by using event-based reporting of ESM data where participants can either fill out a survey when a social interaction has occurred, or they could report on their last social interaction.

Also, we only have information from one person's perspective but extrinsic ER is an inherently social process where more than one person is required (Niven, 2017). Future research should look at dyadic contexts and get informant reports so that we can obtain perspectives from both the regulator and the target. Observational studies in the laboratory would be a helpful way to examine these behaviors because it would allow researchers to obtain both objective and subjective reports of regulatory behaviors and outcomes.

The highly skewed distribution of all four state extrinsic ER strategy variables forced us to deviate from our initial pre-registered analysis plan. To our knowledge, there is only one other

study that has examined extrinsic ER in daily life using momentary surveys (Tran et al., 2022). However, their study focused on goals, effort, and intentions of the regulator. Here, we focused on the frequency and extent of extrinsic ER strategy use. In measuring these variables on a continuous scale, we discovered that people do not report regulating others' emotions in most of their social interactions. Fortunately, we were able to find a novel modeling approach that could handle these non-normal outcome distributions. The hurdle models used for analysis provided a unique opportunity to examine such differential patterns of the implementation of extrinsic ER strategy use. While we did not measure effort in this study directly, these findings suggest that there is a difference between deciding how to regulate and how much time and effort one might put towards regulation once a strategy is implemented (Tran et al., 2022). Hurdle models can reveal nuances in extrinsic ER use in daily life that would not be possible with traditional MLM approaches. Despite the skewed data, we recommend continuing to examine extrinsic ER as a continuous measure to account for as much variability in extrinsic ER strategy use in daily life. Our findings suggest that asking participants about extrinsic ER strategy use in terms of time spent engaging in the strategy makes the data susceptible to highly skewed distributions. Perhaps it would be better to examine extrinsic ER from an effort standpoint (e.g., "how hard did you try to help them regulate?). It may also be better to examine extrinsic ER using daily diary procedures in which participant report on the highest point and lowest point in the day, an approach used in prior research to identify patterns in ER strategy use across contexts (English et al., 2017).

4.4 Conclusion

The aim of this study was to examine the associations between extrinsic ER strategy use and regulator well-being at the trait and state level, and the contextual predictors of extrinsic ER in

daily life. We found that extrinsic ER strategy use was not predictive of trait well-being, but it was differentially associated with daily negative affect. Furthermore, the findings suggest that experience-focused extrinsic ER strategies are used more with close others while expression-focused strategies (such as suppression) may be used more with non-close others. Finally, there was preliminary evidence that psychological features of the situation may also be linked to varying degrees of extrinsic ER strategy use. Building on prior work and theorizing regarding emotion regulation flexibility by examining interpersonal interactions, these findings shed light on how context shapes our responses to others' emotions and how those behaviors may also have consequences for our own well-being.

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