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# Impact of Situational Context on Gratitude and its Affective Outcomes

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Impact of Situational Context on Gratitude and its Affective Outcomes

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A dissertation submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy

In

Clinical Psychology

Seattle Pacific University

School of Psychology, Family, & Community

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### Abstract

Previous research indicates gratitude is associated with positive affective outcomes (Wood, Froh, & Geraghty, 2010). However, researchers have primarily examined gratitude across long periods of time, and exclusively in the context of positive events. Additionally, few researchers have examined the impact of situational factors on state gratitude during specific moments. The purpose of this study was to assess the affective effects of state gratitude in specific positive versus negative events, and to examine how situational factors facilitate gratitude in a naturalistic setting. Participants included 148 (72% women) undergraduate students ( $M$  age = 19.26,  $SD$  = 1.63). Across eight weeks, participants recorded the best and worst event of each week while completing measurements of emotional experiences anchored to those events. Multilevel modeling was used to test the effects of weekly gratitude on weekly negative affect (NA), positive affect (PA), and depression symptoms. All variables were anchored to the best and worst events of each week, except depression symptoms. Events were also coded as dependent or independent and interpersonal or non-interpersonal. Results showed that person-centered weekly state gratitude predicted higher levels of weekly state PA in the context of both best ( $B = .515, p < .001$ ) and worst events ( $B = .600, p < .001$ ). Person-centered weekly gratitude did not predict weekly NA in either context, but gratitude linked to the best event predicted significantly lower weekly depressive symptoms ( $B = -.109, p = .023$ ). Analysis of situational factors showed that participants were more likely to endorse gratitude following the best event when the event was coded as independent ( $B = 1.634, p < .001$ ) or interpersonal ( $B = 1.193, p < .001$ ), with a significant interaction ( $B = -.899, p = .046$ ) indicating the highest level of gratitude when the event was both independent and interpersonal. There were no effects for situational factors on gratitude following the worst event. These results demonstrate the unique within-person effects of state gratitude in response to both positive and negative events. This study also offers evidence that positive events characterized as independent and interpersonal elicit the highest level of gratitude in a naturalistic setting.

Keywords: gratitude, affect, depressive symptoms; context-specific

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## CHAPTER I

### Introduction and Literature Review

Since the birth of positive psychology, gratitude has been hailed as a foundational construct with the potential for contributing to and cultivating enhanced well-being (Seligman & Csikszentmihalyi, 2000). Extant studies suggest that gratitude is associated with a variety of positive correlates and consequences, including desirable affective outcomes (Wood, Froh, & Geraghty, 2010). However, researchers have primarily examined the benefits of trait gratitude or general experiences of gratitude across long periods of time such as an entire day, week, or month. The impact of experiencing gratitude at the state level during specific events is largely unknown; specifically, the immediate or state-level benefits experienced within the context of the event that elicited gratitude are relatively unexplored. Additionally, few researchers have examined the impact of situational factors on state gratitude as experienced during specific positive or negative experiences in the flow of naturalistic life events. Therefore, the purpose of this paper is twofold: (a) to assess the affective effects of state gratitude in specific positive versus negative situational contexts and (b) to examine how situational factors, such as whether events are interpersonal or not and independent or dependent on one's own behavior, facilitate or inhibit the experience of state gratitude in naturalistic settings.

In this paper, I will first define gratitude and its core components including distinguishing features, assessment at the trait and state levels, and general benefits of experiencing gratitude. Next I will review positive affect, negative affect, and depression as affective outcomes of state gratitude. Lastly, I will introduce contextual (event valence) and situational (independence and interpersonal) variables that may impact the experience of state gratitude and its subsequent affective outcomes.

## Gratitude

### Definition

Gratitude is a prosocial emotion that can be conceptualized as both an attribution-dependent state and a trait. State gratitude is a temporary affect that occurs when an individual recognizes the presence of a positive experience or outcome and attributes it to an external cause (Emmons & McCullough, 2003; Weiner, 1985). Trait gratitude refers to the propensity to recognize and be mindful of such situations when they occur, and to experience feelings of gratitude regularly (McCullough, Emmons, & Tsang, 2002). Gratitude may be differentiated from other emotions by its core cognitive appraisals, by how it is experienced subjectively, and by its theorized action tendency.

**Cognitive appraisal.** The emotion of gratitude is the result of a core foundational cognitive appraisal: the recognition that an individual is the recipient of a positive experience or outcome and the recognition that there is an external cause for that outcome (Emmons & McCullough, 2003; McCullough, Kilpatrick, Emmons, & Larson, 2001). For this reason, gratitude has been called an *other-praising* emotion (Algoe & Haidt, 2009). Typically, the external cause is appraised as an outcome generated by another person (or benefactor); however, research suggests that it is also possible for an individual to consider nonhuman sources (e.g., God, animals, the cosmos) as benefactors (Solomon, 1977; Teigen, 1997). Additionally, previous studies indicate that when another person is the perceived external cause of the positive outcome, further cognitive appraisals may also impact the experience of gratitude. One study examined the impact of benefit appraisal, or specific attributions about the aid received (Wood, Maltby, Steward, Linley, & Joseph, 2008); individuals reported higher levels of gratitude when they appraised the aid provided as based upon genuine desire to help, costly to the benefactor, and

higher in value for the recipient. Separately, Algoe, Haidt, and Gable (2008) discovered that when individuals perceived the benefactor as being responsive or empathic to the needs of the beneficiary, the beneficiary was more likely to feel grateful.

**Subjective state and related emotions.** Previous researchers have indicated that state- and trait-level gratitude have not yet been linked to a specific pattern of physiological features or unique facial expressions (Algoe & Haidt, 2009; McCullough et al., 2002). However, gratitude is clearly linked to a characteristic subjective emotional experience. Individuals endorse words such as “grateful,” “thankful,” and “appreciative” when describing experiences of gratitude (Emmons, McCullough, & Tsang, 2003). The experience of gratitude is considered to have a positive valence and is associated with other positive emotions such as happiness, pride, and hope (Emmons & McCullough, 2003; Overwalle, Mervielde, & De Schuyter, 1995). Furthermore, a confirmatory factor analysis indicated that self-reported ratings of trait-level gratitude are related, but not equivalent to, other positively valenced emotions (e.g., dispositional happiness, vitality, optimism, and hope), with the previously described cognitive appraisal as the distinguishing feature (McCullough et al., 2002).

**Action tendency.** Gratitude has been theorized to elicit a distinctive action tendency, making particular behaviors more likely. Upon appraising oneself as the recipient of a valued gift from an external source, people are thought to experience a strong motivation to reciprocate kindness to the benefactor, pay forward the good experienced to others, or engage in otherwise prosocial behavior (McCullough et al., 2001). Previous researchers demonstrated that trait gratitude is indeed associated with prosocial behaviors as measured by self-report and observer ratings of prosocial characteristics (McCullough et al., 2002); specifically, individuals with higher levels of trait gratitude were perceived as more empathic and provided greater help (both

concrete and emotional) to peers in the last month. Using an experimental design, Bartlett and Desteno (2006) also identified a relationship between state-level gratitude and a desire to behave in a prosocial manner. In a study in which participants received and distributed small amounts of money, Tsang (2006) compared the effects of receiving a positive outcome by chance to receiving a favor. Results showed that individuals who received an intentional favor from another person behaved more generously by allocating more resources to their benefactor. Emmons and McCullough (2003) also demonstrated that individuals who completed daily gratitude exercises (monitoring and reflecting on positive events) over prolonged periods (e.g., 2 weeks) reported offering more emotional support to others compared to those in two alternative conditions characterized by documenting hassles through each day and reflecting on ways one may be better off than others (i.e., downward social comparison).

### **Comparison to other positive states.**

The aforementioned core features of gratitude help to discriminate it from other positively valenced emotions, including both the general state of joy and specific related *other-praising* emotions that are associated with increased attention and motivation directed toward other people. First, Algoe and Haidt (2009) demonstrated that gratitude and related other-praising emotions are similarly distinct from joy, a general positive emotion that is triggered by perceived progress toward a goal and is typically associated with a subjective sense of high energy and celebration. Joy does not require an interpersonal exchange to trigger it; gratitude, on the other hand, is often interpersonal in nature, triggered by actual or perceived actions of others.

Moreover, gratitude is distinct from other-praising emotions such as admiration and moral elevation (Algoe & Haidt, 2009). Admiration is a response to witnessing superior skill or talent that typically motivates the individual to work on self-improvement. Moral elevation is a

response to witnessing acts of moral beauty, virtue, or uncommon moral excellence, and motivates the individual to help others and emulate the moral virtue witnessed. Individuals experience admiration when witnessing others' display of talent or other non-moral abilities, whereas moral elevation is theorized to be triggered by witnessing another person doing moral good toward a third party (not the self). In contrast, gratitude is thought to be triggered by perceiving oneself as a recipient. Regarding action tendencies, Algoe and Haidt (2009) found that gratitude was the only positive emotion (relative to joy, admiration, and elevation) associated with the choice to interact with the prosocial individual (benefactor) and that individuals in a gratitude condition had a greater desire to give back to others. In contrast, admiration was linked with a desire to work towards one's own goals and moral elevation was associated with a desire to perform or imitate good deeds, in line with theorized action tendencies. Results from this study indicate that gratitude is a unique construct, with distinct motivations and action tendencies when compared to related positively valenced and other-praising emotions.

### **Trait and State Gratitude**

**Trait.** As previously described, gratitude may be characterized as both a trait and attribution-dependent state. Trait gratitude refers to a greater tendency to recognize and be mindful of situations in which the individual benefits from the actions of another. A grateful disposition can be further understood as a reduced threshold for recognizing beneficiary outcomes, which may be associated with additional emotional experiences or facets related to gratitude including intensity, frequency, span, and density (McCullough et al., 2002). Intensity refers to the tendency for high trait individuals to feel gratitude more intensely in a given moment than someone less disposed toward gratitude. Those more disposed toward gratitude

may also experience that emotion more often throughout the day (frequency) and may feel grateful for a greater number of circumstances at a given moment (span). Lastly, density refers to a greater number of persons to whom one feels grateful in the context of a single outcome. These various facets suggest a person's ability to experience gratitude in any given moment is impacted by general tendencies and characteristics that comprise trait gratitude. Furthermore, several measures have been developed over the past fifteen years that assess levels of trait gratitude.

Currently, there are three primary measurement tools to assess trait gratitude: the Gratitude Questionnaire (GQ-6; McCullough et al., 2002), the Appreciation Scale (AS; Adler & Fagley, 2005), and the Gratitude, Appreciation, and Resentment Test (GRAT; Watkins, Woodward, Stone, & Kolts, 2003). A confirmatory factor analysis examining all three measures in the same model supported a one-factor structure across all three measures, suggesting that gratitude and appreciation are best conceptualized as a broad unitary personality trait (Wood et al., 2008). All three self-report measures assess the general tendency toward a grateful disposition, reflecting a self-concept or personality variable. Although previous researchers provide evidence that gratitude may be conceptualized and measured as a trait, it bears noting that such measures assess the tendency or disposition to experience gratitude without reference to the context in which it may be experienced. Trait measurement is related, but distinct from measurement of the extent to which an individual experiences grateful states in particular moments and situational contexts (McCullough, Tsang, & Emmons, 2004).

**State.** State gratitude refers to an acute emotional experience that occurs when an individual recognizes the presence of a positive outcome attributable to an external cause in a specific context (McCullough et al., 2001). Rosenberg (1998) proposed that state-level emotions are distinct from trait-level emotions because they are discrete psychological changes as a

reaction to the environment. Several researchers demonstrated that state gratitude can vary as a function of both situational factors and appraisals of the benefit received (see aforementioned Cognitive Appraisals section; Bartlett & Desteno, 2006; Wood et al., 2008). Previous researchers have assessed state gratitude using brief measurements, such as mean levels on rating scales for three gratitude-related words (“grateful,” “thankful,” and “appreciative”; Emmons & McCullough, 2003). Alternative measurements include rating the intensity of gratitude after a behavioral experiment (Overwalle et al., 1995; Veisson, 1999) and asking participants to describe their emotional experiences while coding for the number of gratitude-related words (Weiner, Russell, & Lerman, 1979). Measurements that identify this discrete psychological experience are important because they may offer incremental information beyond trait-level gratitude. Furthermore, Kluemper, Little, and DeGroot (2009) demonstrated that state-level emotions can predict relevant outcomes above and beyond trait-level emotions. Therefore, the assessment of state-level gratitude provides an opportunity to examine the contextual influence on one’s experience of gratitude and its subsequent outcomes.

However, there exists variability in the ways that previous studies have measured state gratitude. Some extant studies included brief measurements that assessed the degree to which participants felt grateful across an entire day (Emmons & McCullough, 2003), an index which is different than a trait measurement, but still devoid of context and separate from the experience of gratitude in response to a specific situation. Reported gratitude across discrete periods of time (day, week, month) may fluctuate as a function of the events experienced during that time, but such reports are superordinate to the emotional reaction of a situation and therefore not context-specific given that situational factors have rarely been assessed simultaneously. Thus, levels of gratitude across an entire day may represent a separate, higher order classification of gratitude,

rather than a state-level emotion anchored to a specific situation (Rosenberg, 1998). Similar to trait gratitude, a higher order classification is significantly impacted by the characteristics of the individual and does not allow for the examination of contextual influence on discrete emotional experiences (McCullough et al., 2004). Therefore, attempts to better understand state gratitude above and beyond trait levels should include measurements that are rooted within a specific context or situation.

### **Benefits of Gratitude**

Many correlational and experimental studies have highlighted the benefits of experiencing both trait- and state-levels of gratitude. However, the majority of studies have examined trait gratitude. Several correlational studies have shown that trait gratitude is associated with higher levels of indicators of subjective well being such as happiness and life satisfaction (Toussaint & Friedman, 2009; Wood et al., 2010). Researchers also identified relationships of trait gratitude with favorable constructs such as other positive personality traits, positive relationships, and physical health. In a review of studies that included personality characteristics, Wood and colleagues (2010) found that trait gratitude was correlated with other positive traits such as emotional warmth, gregariousness, activity seeking, trust, and altruism. Furthermore, trait gratitude was also negatively correlated with undesirable characteristics such as anger, hostility, depression, and emotion vulnerability. As previously described, trait gratitude is linked to engaging in prosocial behavior and increased social support (see Action Tendencies). Additionally, researchers have detected positive links of trait gratitude with self-rated physical health (Hill, Allemand, & Roberts, 2013).

Far fewer researchers have examined the impact of state gratitude and many used methods of measurement that are not context-specific (i.e., anchored to a specific experience).



For example, Emmons and McCullough (2003) demonstrated experimentally that participants who completed weekly gratitude exercises over 10 weeks (e.g., writing five things in one's life for which one is thankful) reported on average higher overall well-being, fewer somatic symptoms, and increased exercise. Similarly, Froh, Yukewicz, and Kashdan (2009) demonstrated a positive relationship between state gratitude across an entire day and optimism, life satisfaction, social support, and prosocial behavior in adolescents. This type of study, as well as laboratory studies manipulating gratitude (e.g., Wood et al., 2008), although important, does not yield information about context-specific experiences of gratitude and associated outcomes in the flow of one's life in naturalistic settings. Given that existing literature primarily focuses on the benefits of gratitude at the trait level, or state level as measured across an entire day or week, there is a need for further exploration of grateful emotions anchored to relevant events and the potential impact of contextual factors associated with state-level experiences.

As the foregoing review suggests, gratitude has been linked correlationally and experimentally to a variety of positive outcomes. However, core outcomes of gratitude arguably include affective states related to positive affect, negative affect, and depression (Wood et al., 2010). Whereas most of the previously described benefits are associated with global or trait characteristics, affective outcomes are appropriate to examine as potential consequences of state-level experiences of gratitude, given that they are likely to be influenced by changes in the situation or context. The purpose of the present study is to further examine the situational effects of state gratitude on positive affect, negative affect, and depression. In the following section I will provide a definition of each outcome, discuss how each construct is assessed and conceptualized at the state level, and describe the current literature supporting its hypothesized relationship with gratitude.

## Core Affective Outcomes

### Positive and Negative Affect

The structure of an affective experience is typically measured with two basic dimensions: positive and negative affect (Watson & Tellegen, 1985). Positive affect (PA) represents a range of pleasant emotions and negative affect (NA) represents a range of unpleasant experiences. More specifically, high levels of positive affect are characterized by positive valence and high energy or activation, experienced typically as increased interest or alertness. Low levels of positive affect indicate sadness, disinterest, and a lethargic state. High levels of negative affect are characterized by negative valence and high arousal, and are linked to distressing mood states such as anxiety, anger, disgust, or guilt. Low levels of negative affect are associated with feeling peaceful and calm (Watson, Clark, & Tellegen, 1988; Watson & Tellegen, 1985). Researchers suggest that PA and NA are important constructs to consider because they are associated with social activity, physical health, and psychopathology (Watson, Clark, & Carey, 1988). For instance, high PA has been linked to greater physical activity and social behavior (Lawton, Winter, Kleban, & Ruckdeschel, 1999). Prospective analyses indicated a reciprocal relationship between high NA and poor physical health (Finch, Baranik, Liu, & West, 2012). Other researchers also found that increased PA is associated with lower risk of mortality among medical populations (Moskowitz, Epel, & Acree, 2008). Regarding psychopathology, high NA was repeatedly correlated with symptoms and diagnoses of both anxiety and depression, whereas low PA has typically correlated with higher depression (Brown, Chorpita, & Barlow, 1998; Watson et al., 1988). Thus, PA and NA constitute important affective processes.

**Measurement of affect.** Positive and negative affect are assessed as both state-level experiences and trait-like characteristics. The most widely used measurement for PA and NA is

the Positive Affect and Negative Affect Scales (PANAS; Watson et al., 1988). The PANAS has demonstrated adequate reliability when participants were asked to rate the extent they endorse each item *in general* or *during the past year*. These results indicate that PA and NA express trait-like stability, suggesting that individuals may have a general tendency to feel more or less PA and NA (Rosenberg, 1998). Although PA and NA appear to be trait-level constructs, there is evidence to suggest they are also experienced as state-level emotions and can be measured within a given context or anchored to a specific moment. For example, PANAS instructions with a shorter time frame have also demonstrated adequate reliability when participants were asked to rate each item in a specific moment, across an entire day, or entire week. Short-term instructions were also sensitive to fluctuations in affect, including affect variability following specific events (Stawski, Sliwinski, Almeida, & Smyth, 2008), supporting the conceptualization of a state-level affective experience in response to different contextual factors (Röcke, Li, & Smith, 2009; Watson et al., 1988).

**Distinctness of affective dimensions.** Several confirmatory and exploratory factor analyses support the conceptualization of PA and NA as two distinct dimensions rather than two opposing ends of the same dimension (Crocker, 1997; Tellegen, Watson, & Clark, 1999; Tuccitto, Giacobbi, & Leite, 2010). Recently, Rush and Hofer (2014) conducted a multilevel factor analysis to test whether PA and NA are separate constructs as measured across all participants (between-person) and whether they remain separate after repeated measurements within the same participant (within-person). Results indicated a two factor structure at between- and within-person levels, supporting the notion that PA and NA are separate constructs which can be assessed at both trait and state levels. Additionally, PA and NA demonstrated a moderate negative correlation at the within-person level, and no significant relationship at the between-

person level. Although they appear to be separate constructs, a moderate inverse relationship at the level of state fluctuations within the person suggests moderate dissociation of PA and NA, such that individuals typically do not experience high levels of PA and NA at the same time (Rush & Hofer, 2014). Given the distinctive nature of these constructs, it follows that state gratitude may have unique effects on PA and NA.

**Relationship with gratitude.** The positive psychology literature includes several studies with evidence of a relationship between gratitude and various constructs of well-being, including emotional functioning as defined by positive and negative affect (Joseph & Wood, 2010). In one cross-sectional study, McCullough and colleagues (2002) used both self-reports and informant-reports of trait gratitude to demonstrate a positive correlation with trait PA and a negative correlation with trait NA. In a separate study that also included trait affect, state gratitude as reported across an entire day was correlated with higher levels of trait PA and lower levels of trait NA (McCullough et al., 2004). With an adolescent sample, Froh and colleagues (2009) explored the correlational effects of state gratitude on state PA and NA, with state-level experiences measured across an entire day. Results indicated that daily gratitude was positively correlated with PA, but contrary to previous research, there was no relationship with NA. Lastly, in an experimental study, Emmons and McCullough (2003) compared the effects of three exercises (recording experiences of gratitude, hassles, and social comparison) across two weeks. Similarly, results showed that the participants who completed gratitude exercises reported higher daily PA, but no significant change in daily NA. These studies indicate that gratitude is in fact related to changes in affect, and that links of gratitude to PA may be more consistent than those with NA. However, current research is primarily cross-sectional and only examines trait

gratitude or state gratitude as measured across short periods of time that are not context-specific (e.g., daily gratitude), a goal of the present study.

### **Depressive Symptoms**

Links of gratitude to PA and NA suggest that it may also be of relevance to depressive symptoms. Depressive symptoms include negative emotional and physical experiences described in the diagnostic criteria of a major depressive episode found in the DSM-5 (American Psychological Association, 2013). Emotional symptoms include depressed mood, diminished interest or inability to experience pleasure, feelings of worthlessness or guilt, and recurrent thoughts of death. Physical symptoms include significant weight loss or gain, insomnia or hypersomnia, psychomotor agitation, fatigue, and concentration difficulties. Depressive episodes are associated with a unique affective experience that includes high negative affect and low positive affect (Brown et al., 1998; Clark & Watson, 1991). Similar to low PA and high NA, depressive symptoms are correlated with social impairment and lower perceived quality of life (Mars et al., 2015).

**Measurement of depressive symptoms.** Depressive symptoms are often assessed as a syndrome, which is then categorized as a diagnosed disorder. However, symptoms may also be evaluated as temporary states with varying levels of severity. Researchers suggest that depressive symptoms may fluctuate in response to environmental stimuli or transient life stressors (Brown, et al., 1998). Therefore, the evaluation of symptoms is not limited to categorical diagnoses or stable personality traits; they can also be assessed as a mood state in response to various situations or contexts across a short period of time (i.e., a week; Lewinsohn, Petit, Joiner, & Steeley, 2003). There are many self-report measurements that evaluate fluctuations of depressive symptoms across brief periods of time. The Center for Epidemiological Studies–Depression

Scale (CES-D; Radloff, 1977) instructs individuals to rate the degree they experienced a list of 20 symptoms in the past week. Similarly, the Patient Health Questionnaire–9 (PHQ-9; Kroenke & Spitzer, 2002) instructs individuals to rate the degree they experienced nine symptoms in the past two weeks.

**Relationship with gratitude.** Several researchers have demonstrated that higher levels of gratitude are linked to lower levels of depression. First, trait gratitude appears to be negatively correlated with stable levels of depressive experiences as assessed by the NEO Personality Inventory, a measurement of trait-like characteristics (Costa & McCrae, 1992; Wood, Joseph, & Maltby, 2008). Beyond trait gratitude, results from intervention studies showed that practicing gratitude using various exercises led to decreased depressive symptoms (Wood et al., 2010). A meta-analysis conducted by Sin and Lyubomirsky (2009) identified nine studies that empirically tested gratitude interventions against a comparison group. Individuals who completed gratitude interventions demonstrated a greater decrease in depressive symptoms from pretest to posttest. Several studies also included evidence of the long-term effects of gratitude interventions on depression. For example, Seligman, Steen, Park, and Peterson (2005) examined the effects of listing *three good things* that went well and why compared to journaling about early memories each day. Results indicated that individuals who practiced gratitude demonstrated a significant decrease in depressive symptoms experienced within the past week at one month, three months, and six months after the intervention. Seligman and colleagues demonstrated the same long-term effects for another gratitude exercise that involved writing a gratitude letter to a person that participants had not properly thanked, as well as delivering it in person.

These demonstrated effects suggest that gratitude may serve as a way to reduce or even treat depressive symptoms. Furthermore, gratitude may have a positive impact on depressive

symptoms because of its positive relationship with PA, an affective experience that is typically absent or low in depression (Harbaugh & Vasey, 2014; Lambert, Finchman, & Stillman, 2012). Although previous researchers have identified a relationship between gratitude and depression, it is limited to the practice of gratitude exercises in a general, non-specific context, leaving the role of situational context on gratitude effects unclear. Specifically, most intervention studies show the effects of feeling grateful across an entire day, or encourage participants to list events from the day that caused them to feel grateful (Wood, Joseph, & Maltby, 2009). Testing the effects of gratitude inducing exercises is distinct from exploring the effects of state-level gratitude in response to specific contexts. Additionally, all interventions involved the recollection of feeling grateful in response to positive events. It is unknown whether gratitude has positive effects on affective outcomes in the context of positive events alone, or in the context of negative events as well.

### **Context**

Life events researchers have examined the impact of context-specific factors on affective outcomes such as PA, NA, and depression (Moberly & Watkins, 2008; Phillips, Carroll, & Der, 2015). State-level emotional experiences are often perceived as a reaction to a given event such as a particular stressor, making life events a relevant framework for examining the relationship between state-level emotions and contextual and situational factors. For example, Hankin, Stone, and Wright (2010) examined stressful life events in adolescents and discovered that stressful events characterized as interpersonal and caused by the participant were associated with greater depressive and anxiety symptoms. Similarly, Sheets and Craighead (2014) found that higher chronic interpersonal stress predicted greater risk for depression recurrence, whereas non-interpersonal stress was not associated with recurring depressive symptoms. Given that gratitude

requires a cognitive appraisal of a particular situation, situational variables may also influence the emotional process of state gratitude and its subsequent outcomes. In the following sections, I will discuss the valence of an event as a relevant contextual factor. I will also identify and discuss the potential influence of two situational factors within a given event: independent versus dependent and interpersonal versus non-interpersonal.

**Positive and negative events.** First, events that trigger emotional experiences may differ in valence—that is, whether or not the individual perceives the event as subjectively positive or negative. Research indicates that positive events are often associated with emotional benefits (Gentzler, Morey, Palmer, & Yuen Yi, 2013) and negative events can be linked to damaging physical and emotional consequences (Chida & Hamer, 2008; Watkins, Moberly, & Moulds, 2008; Zoccola, Quas, & Yim, 2010).

Regarding gratitude, nearly all of the existing research has shown the various benefits of experiencing gratitude in relation to positive events (Wood et al., 2009). Furthermore, all empirically tested gratitude exercises involve the recollection of positive events (Sin & Lyubomirsky, 2009). Few researchers have studied the presence of grateful emotions during negative events or in times of distress (Rosmarin, Pirutinsky, Greer, & Korbman, 2016). This gap in research may be influenced by the core cognitive appraisal thought to characterize gratitude: The individual is the recipient of a benefit or positive experience caused by another being. However, it might be possible to experience gratitude during a negative event if one is able to identify positive salient features of the negative situations (e.g., “even though my partner and I broke up, at least we ended on good terms”), or alternatively, if gratitude is directed at an alternative positive outcome that is influenced by the presence of the negative outcome (e.g., “losing my job allows me to spend more time with my family”). In a similar vein, posttraumatic



growth is a construct describing positive changes within the individual that occur as a result of a struggle, crisis, or a traumatic event (Tedeschi, Park, & Calhoun, 1998). Analogously, some individuals may plausibly experience gratitude and associated positive outcomes even in the context of stressors or other negative events. Therefore, it is warranted to investigate the occurrence and effects of gratitude in the context of both positive and negative events.

**Independent and dependent.** In addition to positive/negative valence, another important situational factor of any event is whether or not the occurrence of the event was dependent or independent of the individual's personal agency or influence on his or her environment (Kercher & Rapee, 2009; Turner, Goodin, & Lokey, 2012). A dependent event is caused by the actions of the individual, whereas an independent event is caused by forces beyond oneself. For example, performing well on a test would be considered a dependent event to the extent that one prepared for it, whereas receiving support from a friend would be an independent event to the extent that it was unsolicited. Previous research examining stressful life events suggests that the independent or dependent nature of an event can impact affective outcomes. Specifically, studies indicate that negative dependent events predict increased state-levels of stress, anxiety, and depressive symptoms (Hankin & Abramson, 2001; Hankin et al., 2010).

Within the conceptual framework of gratitude, a positive event that is independent of the individual's agency (i.e., caused by an outside force) would be consistent with the previously described definition of gratitude, and therefore may result in greater levels of gratitude relative to dependent positive events. Recognizing that one received a benefit caused by an external source has been theorized as a necessary cognitive appraisal in order to experience gratitude (see Cognitive Appraisal section). However, no researchers have formally tested for differences in state gratitude as a response to specific dependent and independent events, examining whether

this situational variable impacts gratitude in a theoretically consistent manner. Specifically, it is unknown how independence or dependence might impact gratitude during a negative event. One possibility is that a negative event with an external cause may decrease the likelihood of experiencing gratitude as it may situationally constrain one's ability to recognize alternative benefits the individual has received through external sources. Resolving this question would have implications for what might be realistically expected from gratitude interventions (i.e., whether gratitude works even in the face of externally-caused negative events, or whether it is best practiced in positive independent events). Further examination of the independent or dependent situational factor in various contexts is needed to better understand the effects on state gratitude.

**Interpersonal and non-interpersonal.** A second situational variable is whether the event was interpersonal or non-interpersonal. Interpersonal refers to an event that involved an interaction with at least one other person and a non-interpersonal event occurs without any social interaction (i.e., in isolation). For example, arguing with a friend would be an interpersonal event and sleeping through one's alarm would be a non-interpersonal event. Extant studies indicate that the interpersonal nature of stressors can exacerbate negative affective outcomes (Sheers & Craighead, 2014), whereas interpersonal positive events predict higher levels of positive affective outcomes (Emmons, 1991).

A positive event that involves an interaction with another person is consistent with the theorized nature of gratitude, which requires the presence of a real or imagined benefactor and cannot be experienced in isolation. Therefore, an interpersonal positive event would likely predict greater levels of state gratitude in comparison to a non-interpersonal, positive event. However, because previous researchers have not examined gratitude in response to negative

events, it is unknown how the interpersonal or non-interpersonal nature of a negative event might impact state gratitude. One possibility is that a negative interpersonal event may constrain or restrict the individual's ability to be mindful of positive events that involve another person (i.e., a benefactor). Further examination of the interpersonal or non-interpersonal factor is also warranted to identify the impact on state gratitude and its affective outcomes.

### **Current Study**

Previous research indicates that when individuals feel grateful, they also experience several desirable affective outcomes including an increase in positive affect, a decrease in negative affect, and a decrease in depressive symptoms (Wood et al., 2010). However, the current literature is limited as most researchers examine trait gratitude or an aggregated, general experience of gratitude measured across an entire day, week, or month. Minimal research has shown the benefits of gratitude as a state-level experience in response to context-specific events. Furthermore, researchers have assessed gratitude in the context of positive events exclusively and it is unknown if experiencing gratitude during negative events is associated with similar outcomes. Lastly, few researchers have explored the situational factors that may facilitate or inhibit the experience of gratitude, such as independent and interpersonal factors.

Given the gaps in the gratitude literature, the purpose of this study is twofold: first, to assess the benefits of experiencing gratitude in different contexts, specifically examining the differences in affective outcomes when experiencing gratitude during specific, positive and negative events. Investigating the extent to which gratitude predicts such outcomes in the context of events that individuals appraise as their *best* and *worst* events of the week provides a high-resolution view into ways in which gratitude's effects may be context-specific; The second goal

is to examine how the situational factors of independence and interpersonal facilitate or inhibit the experience of state gratitude in response to positive and negative events.

This study involved collecting prospective data across eight weeks. After completing baseline measurements at week one, participants recorded a positive and negative event for each of the following seven weeks, then reported event-anchored (specific to the event) state-levels of gratitude and affective outcomes. Based on the literature review, I developed three sets of hypotheses, which are detailed in the following section.

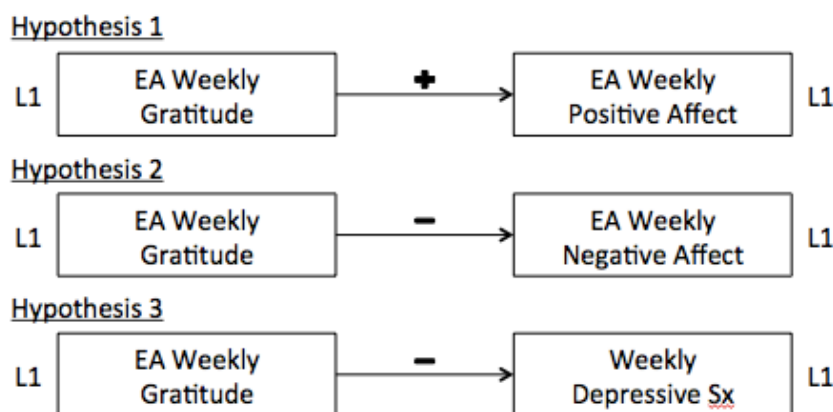
### **Hypotheses**

First, I hypothesized that gratitude will demonstrate the following relationships with affective outcomes and that these relationships will be present for both positive and negative events:

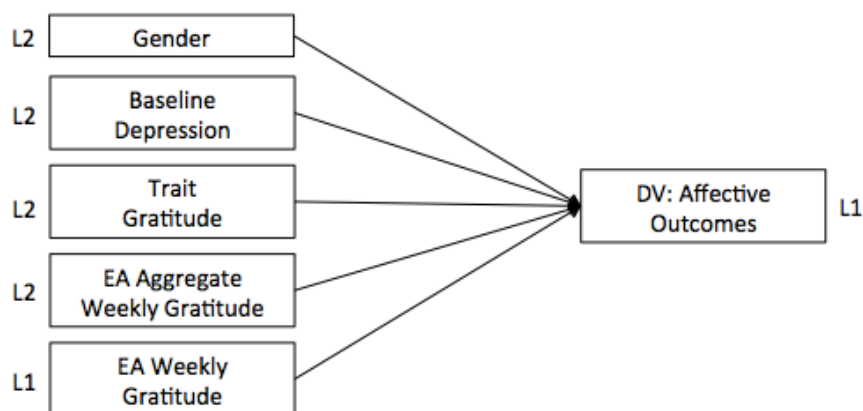
1. Higher weekly event-anchored state gratitude will predict higher levels of event-anchored positive affect.
2. Higher weekly event-anchored state gratitude will predict lower levels of event-anchored negative affect.
3. Higher weekly event-anchored state gratitude will predict lower levels of weekly depressive symptoms.

These hypotheses are based on previous research that indicates state gratitude, as measured across a short period of time or induced through gratitude interventions, is correlated with higher levels of positive affect and lower levels of negative affect and depressive symptoms (Woods et al., 2010). There is robust evidence to support these relationships within a positive event, but no known studies have replicated the same findings within a negative event. However, I hypothesized that when an individual is able to experience higher levels of gratitude despite the

negative valence of the event, they will experience similar effects. I also hypothesized these relationships will hold after controlling for gender, baseline depression, and trait gratitude (as represented by a trait measure of gratitude and aggregate weekly gratitude across time), thus identifying the unique effects of state gratitude beyond these variables (See Figure 1 for conceptual models; See Figure 2 for statistical model). Given that gender, baseline depression, and trait gratitude are used as covariates throughout this study, I did not develop any hypotheses for those variables.



*Figure 1.* Conceptual models for event anchored (EA) weekly gratitude predicting weekly affective outcomes. L1 indicates a level 1 variable, a repeated measurement across weeks 2-7.



*Figure 2.* Statistical model for event anchored (EA) weekly gratitude and covariates predicting weekly affective outcomes. L1 indicates a

level 1 variable: a repeated measurement across weeks 2-7. L2 indicates a level 2 variable: one measurement at baseline (gender, depression, trait gratitude) and the aggregated score of EA weekly gratitude.

Regarding the situational factors that impact the experience of gratitude, I hypothesized the following relationships will occur during weekly positive events exclusively:

- 4a. Positive events that occurred independent of the participant's agency (caused by an external source, beyond oneself) will predict higher levels of event-anchored gratitude, relative to dependent events.
- 4b. Positive events that are interpersonal in nature (involved another person) will predict higher levels of event-anchored gratitude relative to non-interpersonal events.
- 4c. Positive events that are categorized as both independent and interpersonal will demonstrate an interaction effect and predict the highest levels of event-anchored gratitude.

These hypotheses are consistent with the theorized situational causes for gratitude. State gratitude is thought to occur when an individual recognizes they received a benefit (i.e., positive event) that was caused by an external force (independent), typically a real or imagined benefactor (interpersonal; See Figure 3). I also hypothesized these relationships will hold after controlling gender.

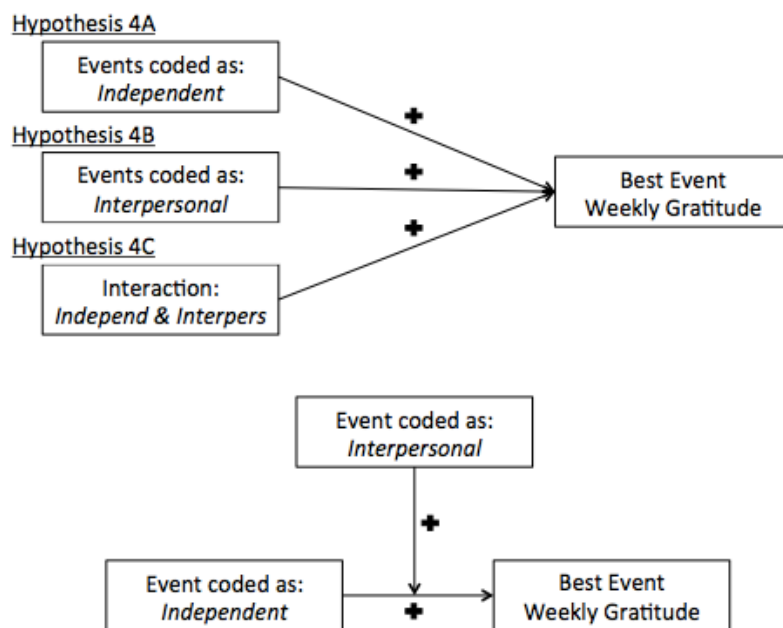


Figure 3. Statistical (above) and conceptual (below) models for situational variables predicting gratitude at best event.

Lastly, I hypothesized the following relationships will occur during the weekly negative events:

- 5a. Negative events that occurred independent of the participant's agency (caused by an external source, beyond oneself) will predict lower levels of event-anchored gratitude, relative to dependent events.
- 5b. Negative events that are interpersonal in nature (involved another person) will predict lower levels of event-anchored gratitude relative to non-interpersonal events.
- 5c. Negative events that are categorized as both independent and interpersonal will demonstrate an interaction effect and predict the lowest levels of event-anchored gratitude.

As previously stated, an independent and interpersonal positive event is consistent with the theorized situational trigger for gratitude. I hypothesized that when participants experience those

situational features in a negative context, it will become more difficult to either feel grateful for positive salient features of the negative event or feel grateful for alternative positive outcomes influenced by the negative event (See Figure 4). I also hypothesized these relationships will hold after controlling for gender.

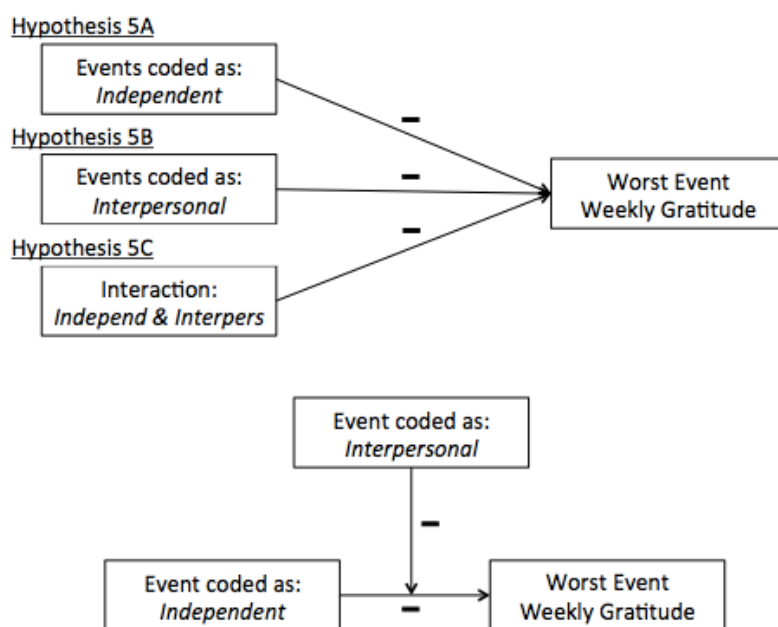


Figure 4. Statistical (above) and conceptual (below) models for situational variables predicting gratitude at worst event.

### Implications

Results from this study could impact our understanding of gratitude and how it can be utilized more effectively in both general and clinical populations. As previously described, there is strong evidence to support the benefits of practicing gratitude as a general intervention. However, if we knew more about gratitude as experienced in response to life events, we could more accurately prescribe gratitude interventions or encourage grateful cognitive appraisals in specific contexts that have been shown to produce the greatest effects. For example, if gratitude during negative events predicts higher levels of PA and lower NA and depressive symptoms, we



could encourage individuals to find ways to express gratitude during stressful life events as a novel way of facilitating positive emotions. Finding that gratitude predicts desirable affective outcomes in the context of both best and worst events would provide a stronger rationale for interventions targeting cultivation of gratitude across both scenarios. Alternatively, if gratitude predicts affective outcomes only in the context of positive events, it may be unfruitful for individuals to attempt to cultivate gratitude in the context of negative events. Additionally, an increased understanding of the situations in which people are capable of experiencing gratitude can provide guidance for how to aid individuals trying to practice gratitude more often. If individuals are more likely to experience gratitude during interpersonal and independent events, but relatively less likely to experience it during dependent, non-interpersonal events, then interventions could be enhanced by increasing awareness and attention toward life events with those distinctions. We could also avoid encouraging individuals to feel grateful in situations that are significantly less likely to produce feelings of gratitude, such as negative interpersonal events. In summary, further exploration of the relationship between gratitude and context may inform future studies of interventions to enhance gratitude in particular contexts.

## CHAPTER II

### Method

#### Participants

The sample consisted of 148 undergraduate students from Seattle Pacific University (107 women, 41 men). Participants' ages ranged from 18 to 29 ( $M = 19.26$ ,  $SD = 1.63$ ) and were predominantly Caucasian (68.2%), Asian (16.9%), Hispanic/Latino (6.1%), or African American (4.7%). The majority of the participants were freshmen ( $n = 69$ ) or sophomores ( $n = 42$ ), but 23 juniors, 11 seniors, and 3 non-traditional students also participated.

#### Procedure

Participants were recruited from introductory psychology courses, where students received course credit for enrolling in a research study. All students were eligible if they were currently enrolled in the introductory psychology course and if they were at least 18 years of age. Repeated assessments across eight consecutive weeks included a baseline questionnaire for the first week and weekly questionnaires for the remaining seven weeks. Data was collected through Qualtrics, an Internet survey program. Participants received an email with a link to the survey every week and had 36 hours to complete each questionnaire in order to maintain approximately one week between assessments.

The baseline questionnaire in the first week included demographic information and trait measurements. The remaining seven weekly surveys assessed state-level experiences by asking participants to record the best event of the week and the worst event of the week, eliciting the specific thoughts and emotions related to the event. Best events were intended to capture a positively valenced experience, and worst events were intended to capture a negatively valenced experience. After providing brief descriptions, participants completed a set of measures that were

anchored to both events. Specifically, participants were asked to recall the level of gratitude, NA, and PA associated with each event. For example, a measure of gratitude anchored to the best event of the week assessed the degree to which a person experienced gratitude in response to that specific event. Additionally, weekly surveys included a weekly assessment of depressive symptoms as experienced across the entire week, which was not anchored to either event.

### **Measures**

**Gratitude – trait.** The Gratitude Questionnaire-Six Item Form (GQ-6; McCullough et al., 2002) is a six-item measure of trait gratitude. Participants rate each item on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Examples of items included, “I have so much in life to be thankful for” and “If I had to list everything that I felt grateful for, it would be a very long list.” Two items are reverse scored, and then all items are summed to create a total score ranging from 6 to 42. The GQ-6 has demonstrated internal consistency in previous studies ( $\alpha = .82$ ) and consists of a robust one-factor solution (McCullough et al., 2002). In this sample, the GQ-6 demonstrated internal reliability ( $\alpha = .78$ ). The GQ-6 was used in the present study to assess and control for trait gratitude.

**Gratitude – state.** State gratitude was measured using three adjectives related to gratitude (Emmons & McCullough, 2003), which were anchored to both the best and worst event of the week. Following a prompt to describe the best and worst events, participants were presented with three gratitude-related emotions (grateful, thankful, and appreciative). Participants then rated the extent to which they experienced each item on a scale from 1 (*very slightly or not at all*) to 5 (*extremely*) in response to each event. Scores for each item were summed to create an index score for weekly gratitude for the best and worst event respectively. In a previous study, the same brief measure demonstrated internal reliability, with  $\alpha$  estimates

ranging from .86 to .92 (Emmons & McCullough, 2003). This brief measurement was used in the present study to assess for state gratitude as experienced in response to the best and worst events. In this sample, the three items demonstrated internal reliability when anchored to best (average  $\alpha = .90$ ) and worst events (average  $\alpha = .95$ ).

**Positive and negative affect.** The Positive and Negative Affective Schedule Short Form (PANAS-SF; Kercher, 1992) is a 10-item measure with five items measuring positive affect and five items measuring negative affect. Participants completed the PANAS as anchored to both the best and worst event of the week. Participants rated the extent to which they experienced each item on a scale from 1 (*never*) to 5 (*always*) in response to each event. The negative affect subscale included the following items: upset, hostile, ashamed, nervous, and afraid. The positive affect subscale included the following items: alert, inspired, determined, attentive, and active. The score for each item is summed to create the two separate subscales. The PANAS-SF was used in the present study to assess four separate constructs: state-level positive and negative affect in response (i.e., anchored) to the best and worst events. The PANAS-SF has been validated across several studies ( $\alpha = .80$ ; Kercher, 1992; Thompson, 2007). In this sample, the PANAS-SF demonstrated internal reliability, with alphas for the four subscales ranging from .73 to .83 (See Table 2 for detailed reliability estimates).

It should be noted that the PANAS is most often used to assess state-level affect by measuring across an entire day or week, rather than retrospectively rating each item as anchored to a specific experience (Rossi & Pourtois, 2012; Watson & Clarke, 1994). The retrospective nature of measuring PANAS anchored to an event (along with event-anchored assessments of weekly gratitude), presents methodological concerns given that extant studies suggest retrospective self-reports are prone to error and bias, particularly as more time elapses between

the event and the moment of self-report (Scollon, Kim-Prieto, & Diener, 2003; Stone, Shiffman, Atienza, & Nebeling, 2007). One alternative solution to measuring the PANAS in context-specific or naturalistic settings is experience sampling methods (Larson & Csikszentmihalyi, 2014). For example, some researchers use interval experience sampling: participants were cued by an electronic device (phone or watch) six to eight times each day, which required them to rate the extent they experienced PANAS items in the present moment or since the last cue (Hoorelbeke, Koster, Demeyer, Loeys, & Vanderhasselt, 2016; Houben et al., 2016). However, there are limitations to interval experience sampling, such as participant burden, higher attrition rates, and habituation to repeated questions (Bolger, Davis, & Rafaeli, 2003). More similar to the present study, Koval and colleagues (2015) used random experience sampling anchored to specific events by asking the following question when randomly cued by an electronic device: “Think about the most [negative/positive] event that has occurred since the last beep, how intense was that event?” A key distinction between the aforementioned studies and the present study is the potential time lapse between the experience of the best or worst event and the moment participants self-report the level of PA and NA directly associated with that event. However, Eisenhower, Mathiowetz, and Morganstein (2004) note that accuracy for retrospective self-reports is better when ratings were linked to discrete, emotionally salient events. Similarly, Algoe and Haidt (2009) retrospectively measured state-level emotions anchored to specific events that elicited strong positive emotions. Therefore, weekly measurements anchored to the best and worst events of the week may arguably attenuate concerns related to the potential errors and biases associated with retrospective methods. Overall, there are both strengths and weaknesses to this specific method of assessment; nonetheless, measuring PA and NA in the

context of experiencing gratitude following specific events addresses an important question and current gap in the gratitude literature.

**Depressive symptoms – baseline.** The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item measure of depressive symptoms intended for use in a general or non-clinical population. Participants rated the extent to which they experienced each item on a scale from 0 (*rarely or none of the time*) to 3 (*most or all of the time*) in the past week. Examples of items include “I felt sad” and “I felt that everything I did was an effort.” Four items are reverse scored, and then all items are summed to create a total score for depressive symptoms ranging from 0 to 60. The CES-D demonstrated internal consistency in previous studies with alphas ranging from .89 to .93 (van Ballegooijen, Riper, Cuijpers, van Oppen, & Smit, 2016) and demonstrated internal reliability in this sample ( $\alpha = .83$ ).

**Depressive symptoms – weekly.** The Center for Epidemiological Studies Depression Scale – Short Form (CES-D-SF; Martens et al., 2006) is a 9-item, shortened measure of the full CES-D. Similarly, participants rated the extent to which they experienced each item on a scale from 0 (*rarely or none of the time*) to 3 (*most or all of the time*) in the past week. In the current study, the CESD-D-SF demonstrated reliability across seven weeks (average  $\alpha = .85$ ).

**Situational factors.** All best and worst events were coded as independent or dependent and interpersonal or non-interpersonal by two independent raters. An event was coded as dependent if the event occurred as a result of the participant’s own agency (Kercher & Rapee, 2009). For example, “I invited my friends over for dinner” would be coded as a dependent event. An event was coded as independent if the event was not likely to be caused by the participant, such as, “My friends made me dinner.” The independent or dependent variable was coded as a binary predictor (dependent = 0, independent = 1).

Each event was also coded as either interpersonal or non-interpersonal (Cambron, Acitelli, & Pettit, 2009). An event was coded as interpersonal if the event contained a social component and non-interpersonal if the event occurred in isolation. For example, “I got in an argument with my friend” would be coded as an interpersonal event and “I slept through my alarm” would be a non-interpersonal event. The interpersonal or non-interpersonal variable was coded as a binary predictor (non-interpersonal = 0, interpersonal = 1).

Following coding, a kappa coefficient was calculated for both independent or dependent and interpersonal or non-interpersonal ratings to determine percentage agreement corrected for chance agreement. Criterion for rater agreement was set at .70, and inter-rater reliability was ensured through regular reliability checks to assess rater drift. Discrepancies were resolved by consensus. Inter-rater reliability for independent or dependent was  $\kappa = .83$  and reliability for interpersonal or non-interpersonal was  $\kappa = .75$  (See Table 1).

Table 1.

*Interrater Reliability for Coded Events*

Variable	Number of Cases	Kappa	Asymptotic Standardized Error	Approximate T	Approximate Significance
Independent	421	.833	.028	17.137	< .001
Interpersonal	429	.751	.034	15.651	< .001

*Note.* Kappa coefficients were calculated by combining all independent/dependent codes across both the best and worst events, and all interpersonal/non-interpersonal codes across best and worst events from weeks 2, 3, and 4.

## Data Analytic Plan

### Overview of Statistical Approach

To examine the proposed hypotheses, several multilevel models (MLM) were tested using Hierarchical Linear Modeling 7.01 (HLM 7.01; Raudenbush et al., 2011). MLM is a regression-based strategy that is ideal for repeated measured data in that it accounts for both

within-person and between-person sources of variability. MLM avoids the assumption of non-independence of data required by ordinary least squares regression, which is often untenable for repeated measures data. It also permits random-effects models, which allow estimates of intercepts and slopes to vary across individuals. Level 1 equations model repeated variables over time. Level 2 equations model individual differences or between-person variability and Level 1 variables are nested within each Level 2 individual. In this study, state gratitude, affective outcomes, and situational factors were Level 1 variables. All covariates were Level 2 variables, which include gender, baseline depression, trait gratitude, and the aggregate score of weekly gratitude. Preliminary analyses of unconditional effects explored evidence for significant variance of intercepts and slopes to inform the use of random intercepts and random slopes. All analyses were conducted using restricted maximum likelihood estimation.

### **Gratitude Predicting Affective Outcomes**

In the first set of hypotheses, there were three separate Level 1 outcome variables: PA, NA, and depressive symptoms. The Level 1 predictor was weekly gratitude. To examine the effects of context, all variables were event-anchored (EA) to either the best or worst event of the week (with the exception of depression) resulting in two sets of analyses: weekly gratitude predicting weekly affective outcomes during the best event of the week and worst event of the week. Therefore, there were a total of six models pertaining to affective outcomes: three models anchored to the best event, and three anchored to the worst event.

Each model tested whether or not gratitude as a response to the specific event (best or worst) predicted affective outcomes as experienced after the event. Depression was the only Level 1 variable not anchored to an event and instead was reported across the entire week. State gratitude was person mean-centered in order to model within-person variability in the outcome



variables (such that deviations above individuals' mean level of gratitude across weeks would predict changes in affective outcomes). Level 2 trait gratitude was included in the model as a control variable in order to obtain unique effects of state gratitude. Additionally, the aggregate score or person mean of weekly gratitude was controlled in order to ensure that the state gratitude measure only assessed within-person variability (i.e., the *centering within context* method; Kreft, de Leeuw, & Aiken, 1995). The following statistical equations represent the model tested for all six outcome variables:

$$\text{Level 1: Affective Outcome\_EA}_{ij} = \pi_{0i} + \pi_{1i} * (\text{Weekly Gratitude\_EA}) + e_{ti}$$

$$\text{Level 2: } \pi_{0i} = \beta_{00} + \beta_{01} * (\text{Gender}) + \beta_{02} * (\text{Baseline Depression}) + \beta_{03} * (\text{Trait Gratitude}) + \beta_{04} * (\text{Aggregate Weekly Gratitude\_EA}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

Mixed Model:

$$\begin{aligned} \text{Affective Outcome\_EA}_{ij} = & \beta_{00} + \beta_{01} * (\text{Gender}) + \beta_{02} * (\text{Baseline Depression}) + \\ & \beta_{03} * (\text{Trait Gratitude}) + \beta_{04} * (\text{Aggregate Weekly Gratitude\_EA}) + \\ & \beta_{10} * (\text{Weekly Gratitude\_EA}) + r_{0i} + r_{1i} * (\text{Weekly Gratitude\_EA}) + e_{ti} \end{aligned}$$

### **Situational Factors Predicting Gratitude During Best Event**

In the second analysis, the Level 1 outcome variable was weekly gratitude during the best event of the week. The Level 1 predictors were the best event coded as independent or dependent (labeled independent) and interpersonal or non-interpersonal (labeled interpersonal). To examine a possible Level 1 interaction between independent and interpersonal, a third variable was created in SPSS by computing the product of the two coded variables. Gender was added to the model as a Level 2 covariate. Predictor variables were not centered because they are dichotomous variables. The following equation represents the model tested:

$$\text{Level 1: Gratitude\_Best Event}_{ij} = \pi_{0i} + \pi_{1i}*(\text{Independent}) + \pi_{2i}*(\text{Interpersonal}) \\ + \pi_{3i}*(\text{Independent*Interpersonal}) + e_{ti}$$

$$\text{Level 2: } \pi_{0i} = \beta_{00} + \beta_{01}*(\text{Gender}) + r_{0i}$$

$$\pi_{1i} = \beta_{10}$$

$$\pi_{2i} = \beta_{10}$$

$$\pi_{3i} = \beta_{10}$$

$$\text{Mixed Model: Gratitude\_Best Event}_{ij} = \beta_{00} + \beta_{01}*(\text{Gender}) + \beta_{10}*(\text{Independent}) \\ + \beta_{20}*(\text{Interpersonal}) + \beta_{30}*(\text{Independent*Interpersonal}) + r_{0i} + e_{ti}$$

### **Situational Factors Predicting Gratitude During Worst Event**

For the final analysis, the Level 1 outcome variable was weekly gratitude during the worst event of the week. Similarly, the Level 1 predictors were the worst event coded as independent or dependent. A Level 1 interaction variable with independent and interpersonal was created, and Level 2 gender was controlled for in the model. Predictor variables were not centered. The following equation represents the model tested:

$$\text{Level 1: Gratitude\_Worst Event}_{ij} = \pi_{0i} + \pi_{1i}*(\text{Independent}) + \pi_{2i}*(\text{Interpersonal}) \\ + \pi_{3i}*(\text{Independent*Interpersonal}) + e_{ti}$$

$$\text{Level 2: } \pi_{0i} = \beta_{00} + \beta_{01}*(\text{Gender}) + r_{0i}$$

$$\pi_{1i} = \beta_{10}$$

$$\pi_{2i} = \beta_{10}$$

$$\pi_{3i} = \beta_{10}$$

$$\text{Mixed Model: Gratitude\_Worst Event}_{ij} = \beta_{00} + \beta_{01}*(\text{Gender}) + \beta_{10}*(\text{Independent}) \\ + \beta_{20}*(\text{Interpersonal}) + \beta_{30}*(\text{Independent*Interpersonal}) + r_{0i} + e_{ti}$$

## CHAPTER III

### Results

#### Preliminary Analyses

Preliminary data screening indicated normality and no evidence of nonlinear relationships between study variables. Means, standard deviations, and reliability estimates for all measures are presented in Table 2. The frequencies of all coded events including situational factors (dichotomous variables) and associated weekly gratitude in the context of both best and worst events are presented in Table 3. The original data set consisted of 161 participants. Missing data analysis indicated 93% of the variables and 70% of the cases had some missing data; 90% of the values in the model had complete data. Further inspection indicated that two participants completed one out of seven weeks of repeated surveys and eleven participants did not complete any weekly surveys (i.e., only completed baseline measurements at week one); therefore, those participants were deleted from the dataset ( $n = 148$ ). Multiple imputation was completed using SPSS 21; however, because results were similar with and without imputation, reported results are based on raw data.

Table 2.  
*Means and Standard Deviations, Normality, and Reliability*

Variable	Range		Mean	SD	Reliability
	Min	Max			
Level 2					
GQ-6	6	42	36.22	5.55	.784
CES-D	0	45	14.16	8.67	.827
Level 1					
CES-D-SF	0	24	6.25	4.92	.852
Best Events					
Weekly Gratitude	3	15	11.09	3.37	.897
Weekly PA	5	25	13.27	4.98	.779

Weekly NA	5	19	6.79	2.62	.734
Worst Events					
Weekly Gratitude	3	15	4.69	2.82	.947
Weekly PA	5	25	9.51	4.38	.827
Weekly NA	5	25	11.59	4.62	.774

*Note.* GQ-6 = Gratitude Questionnaire-Six Item Form; CES-D = Center for Epidemiological Studies Depression Scale; CES-D-SF = Center for Epidemiological Studies Depression Scale-Short Form; Weekly Gratitude = three item measure of weekly gratitude (grateful, thankful, and appreciative); PA = positive affect; NA = negative affect.

Table 3.  
*Frequency of Coded Events and Related Gratitude Levels*

Situational Codes	Best Events			Worst Events		
	Frequency	Percentage	Mean Gratitude	Frequency	Percentage	Mean Gratitude
Dependent, Non-Interpersonal (0,0)	16.14	12.26	10.02	25.71	20.33	4.58
Dependent, Interpersonal (0,1)	90.14	68.44	11.08	22.86	18.08	4.85
Independent, Non-Interpersonal (1,0)	2.57	1.95	9.33	46.00	36.38	4.54
Independent, Interpersonal (1,1)	22.86	17.35	12.40	31.86	25.20	4.87

*Note.* Frequency for each category was averaged across weeks 2-8.

The relationship between all study variables was examined by computing bivariate correlations (See Table 4). Trait gratitude measured at baseline was positively correlated with state gratitude experienced after the best and worst events of the week. Trait gratitude was also negatively correlated with a measurement of baseline depression, weekly depression, and weekly NA across both events. Baseline depression was positively correlated with weekly depression and weekly NA after the best and worst events of the week. Lastly, weekly gratitude following the best event was positively correlated with PA after the best event, and weekly gratitude after the worst event was positively correlated with PA after the worst event. However, there were no

significant correlations between weekly gratitude and NA after the best or worst event of the week.

Table 4.

*Bivariate Correlations Among All Study Variables*

Variable	1	2	3	4	5	6	7	8
1. GQ-6	--							
2. CESD	-.111**	--						
3. CESD-SF	-.184**	.534**	--					
4. Week PA – Best Event	.137**	-.028	-.073*	--				
5. Week NA – Best Event	-.097**	.196**	.301**	.267**	--			
6. Week Grat – Best Event	.234**	-.039	-.144**	.478**	-.011	--		
7. Week PA – Worst Event	.041	.024	-.038	.483**	.253**	.309**	--	
8. Week NA – Worst Event	-.067*	.263**	.460**	.193**	.355**	.158**	.255**	--
9. Week Grat – Worst Event	.086**	-.064	-.083*	.384**	.169**	.314**	.579**	-.005

Note. \* $p < .05$ , \*\* $p < .01$

Preliminary analyses also included a comparison between the event-anchored variables in the context of best and worst events. Paired samples t-tests were conducted to examine the difference between mean levels of PA, NA, and state gratitude between best and worst events. Results indicated that PA and state gratitude were significantly higher following the best events, whereas NA was significantly higher following the worst events (See Table 5).

Table 5.

*Paired Samples t-tests Comparing Weekly Event-Anchored Measures Between Best and Worst Events*

Variable	Mean Diff	SD Error	<i>t</i>	<i>p</i>
PA	2.20	.15	14.80	<.001
NA	-4.77	.15	-32.28	<.001
Gratitude	6.39	.12	52.71	<.001

Note. Difference values represent the mean level at worst event subtracted from mean level at best event.

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Prior to examining hypothesized models, unconditional effects demonstrated evidence of significant between-person variability in intercepts for each outcome variable, along with significant variability in slopes for repeated weekly variables (i.e., weekly gratitude and affective outcomes). Therefore, random intercepts and slopes were used in all models, with the exception of situational factors predicting gratitude, which only allowed for random intercepts given that predictors were dichotomous.

### **Predicting Affective Outcomes After Best Event**

First, three models tested the relationship between weekly state gratitude following the best event of the week and three separate affective outcomes: weekly depression across the entire week, state PA anchored to the best event, and state NA anchored to the best event. Weekly state gratitude (L1) and all four covariates (L2) were entered simultaneously as predictors. Weekly state gratitude was person-centered such that higher scores reflected deviations above the participant's mean score across seven weeks to assess for within-person differences. All L2 predictors were grand-centered such that higher scores reflected deviation above the sample mean, with the exception of gender and *person mean* (aggregate score across repeated measures) of weekly gratitude, which was uncentered consistent with the *centering within context* method (i.e., person-centered; Kreft et al., 1995) of modeling both the person mean and person-centered variable in the same model to distinguish between- from within-person variability.

**Hypothesis 1A: PA after best event.** The first model tested person-centered weekly gratitude predicting PA in the context of a *positive event*. As hypothesized, weekly state gratitude after the best event of the week uniquely predicted higher PA experienced in the context of that same event even when accounting for gender, baseline depression, baseline gratitude, and the aggregate score of weekly gratitude across seven weeks (see Table 5 for results regarding all

analyses anchored to best events). Specifically, given that weekly gratitude was centered at the person level, participants reported significantly higher levels of PA following a positive event when they endorsed higher levels of gratitude than what is typical of themselves (i.e., higher reported gratitude than their average weekly gratitude score across the study). Additionally, the aggregate score of weekly gratitude significantly predicted higher levels of weekly state PA, suggesting that individuals who were chronically higher in state gratitude reported higher levels of PA. There was no significant relationship between weekly PA anchored to the best event and gender, trait gratitude, or baseline depression. Thus, as hypothesized, person-centered weekly state gratitude predicted higher levels of event-anchored PA following a positive event, independent of the effects of depression symptoms, trait gratitude, and aggregate levels of gratitude.

**Hypothesis 2A: NA after best event.** In the next model, person-centered weekly gratitude predicted subsequent NA in the context of a positive event. Unlike the previous model and counter to hypotheses, person-centered weekly state gratitude anchored to the best event of the week did not significantly predict levels of weekly NA following the same event. However, trait gratitude predicted lower levels of weekly NA after the best event. Additionally, individuals who reported higher levels of baseline depression also endorsed significantly higher levels of weekly NA following the best event. There was no effect for gender or the aggregate score of weekly gratitude. Whereas trait variables predicted changes in weekly NA anchored to the best event, person-centered weekly gratitude did not demonstrate a significant unique relationship, contrary to hypotheses.

**Hypothesis 3A: General weekly depression.** Next, person-centered weekly gratitude in the context of the best event of the week predicted levels of depressive symptoms for the week,

not anchored to a specific event. As hypothesized, person-centered weekly gratitude anchored to the best event of the week predicted lower weekly depressive symptoms. Specifically, participants reported significantly lower levels of depressive symptoms when they endorsed higher levels of state gratitude than what is typical of themselves following a positive event. Additionally, participants who endorsed higher levels of baseline depression reported higher weekly depressive symptoms. Gender and weekly aggregate scores of gratitude did not predict levels of weekly depressive symptoms; however trait gratitude at baseline marginally predicted lower levels of depressive symptoms. Thus, as hypothesized, individuals who expressed higher levels of gratitude than what is typical of themselves, following a positive event, experienced significantly lower levels of general depressive symptoms for that given week.

Table 6.  
*Gratitude Predicting Affective Outcomes at Best Events*

	<i>B</i>	<i>SE</i>	<i>pr</i>	<i>p</i>
<u>Model 1A – Predicting PA</u>				
Intercept	4.557	1.406	.262	.001
Gender	-.069	.570	.101	.228
CES-D Baseline	.002	.029	.006	.940
GQ-6	.017	.048	.029	.731
Weekly Gratitude Aggregate	.902	.108	.573	<.001
Person-Centered Weekly Gratitude	.515	.062	.563	<.001
<u>Model 2A – Predicting NA</u>				
Intercept	5.601	.681	.567	<.001
Gender	.403	.274	.122	.144
CES-D Baseline	.066	.014	.368	<.001
GQ-6	-.047	.023	.168	.043
Weekly Gratitude Aggregate	.050	.052	.081	.335
Person-Centered Weekly Gratitude	-.001	.042	.002	.978
<u>Model 3A – Predicting Weekly CES-D-SF</u>				
Intercept	7.053	1.350	.400	<.001
Gender	.698	.549	.106	.206



CES-D Baseline	.299	.028	.666	<.001
GQ-6	-.087	.047	.154	.065
Weekly Gratitude Aggregate	-.174	.010	.139	.096
Person-Centered Weekly Gratitude	-.109	.047	.186	.023

*Note.* All covariates were grand-centered around the sample mean with the exception of gender and weekly gratitude aggregate, which were left uncentered.

### **Predicting Affective Outcomes After Worst Event**

Next, three models tested the relationship between weekly state gratitude following the worst event of the week and three affective outcomes: weekly depression across the entire week, state PA anchored to the worst event, and NA anchored to the worst event. The same covariates were included to identify the unique contribution of weekly gratitude on each outcome. Similar to the previous models, weekly gratitude was person-centered in order to assess the relationship between affective outcomes and gratitude when individuals express higher levels of gratitude than what is typical of themselves (i.e., within-person differences), with the uncentered aggregate or person mean of weekly gratitude also included as a predictor. Gender was left uncentered, whereas trait gratitude and depression were grand-centered to control for between-person differences at baseline.

**Hypothesis 1B: PA after worst event.** The first model included person-centered weekly gratitude as a predictor of PA in the context of a negative event. In line with hypotheses, person-centered weekly state gratitude after the worst event of the week uniquely predicted higher PA following the same event even when accounting for gender, baseline depression, baseline gratitude, and the aggregate score of weekly gratitude across seven weeks (see Table 6). Additionally, the aggregate score of weekly gratitude significantly uniquely predicted higher levels of weekly PA. There was no significant relationship between weekly PA anchored to the

worst event and gender or trait gratitude. Higher levels of baseline depression marginally predicted higher levels of PA. Therefore, as hypothesized, person-centered weekly state gratitude uniquely predicted higher levels of event-anchored PA in the context of a negative event.

**Hypothesis 2B: NA after worst event.** Next, person-centered weekly gratitude predicted weekly NA in the context of a negative event. Contrary to hypotheses, weekly state gratitude anchored to the worst event of the week did not significantly predict changes in weekly NA following the same event. Additionally, there was no significant relationship between weekly NA anchored to the worst event and trait gratitude or the aggregate weekly gratitude score. However, gender (females) and higher levels of baseline depression significantly predicted higher levels of weekly NA following the worst event. Contrary to hypotheses, person-centered weekly gratitude expressed after the worst event of the week did not demonstrate significantly lower levels of weekly NA following that same event.

**Hypothesis 3B: General weekly depression.** Lastly, person-centered weekly gratitude after the worst event of the week predicted generalized, depressive symptoms for the week (i.e., unanchored to an event). Unlike the model that examined gratitude in the context of the best event of the week, person-centered weekly gratitude following the worst event unexpectedly did not demonstrate a significant relationship with generalized weekly depressive symptoms. Similarly, gender and the weekly aggregate score did not predict changes in weekly depressive symptoms; however, higher levels of trait gratitude at baseline significantly predicted lower levels weekly depressive symptoms. As expected, participants who endorsed higher levels of baseline depression reported significantly higher scores for weekly depressive symptoms. Therefore, contrary to hypotheses, person-centered gratitude after the worst event of the week did not have unique effects on the level of general depressive symptoms for that same week.

Table 7.  
*Gratitude Predicting Affective Outcomes at Worst Events*

	<i>B</i>	<i>SE</i>	<i>pr</i>	<i>p</i>
<u>Model 1B – Predicting PA</u>				
Intercept	5.295	.779	.494	<.001
Gender	-.548	.411	.111	.184
CES-D Baseline	.043	.021	.167	.045
GQ-6	-.000	.034	.000	.994
Weekly Gratitude Aggregate	1.108	.081	.754	<.001
Person-Centered Weekly Gratitude	.600	.084	.508	<.001
<u>Model 2B – Predicting NA</u>				
Intercept	9.299	1.101	.577	<.001
Gender	1.218	.582	.172	.038
CES-D Baseline	.134	.030	.348	<.001
GQ-6	-.064	.048	.111	.183
Weekly Gratitude Aggregate	.063	.114	.046	.583
Person-Centered Weekly Gratitude	-.056	.104	1.000	.588
<u>Model 3B – Predicting Weekly CES-D-SF</u>				
Intercept	5.939	1.033	.433	<.001
Gender	.573	.546	.087	.295
CES-D Baseline	.299	.028	.663	<.001
GQ-6	-.104	.045	.099	.023
Weekly Gratitude Aggregate	-.128	.107	.189	.234
Person-Centered Weekly Gratitude	-.002	.072	.002	.981

*Note.* All covariates were grand-centered around the sample mean with the exception of gender and weekly gratitude aggregate, which were left uncentered.

#### **Hypothesis 4: Predicting Gratitude After Best Event**

The next model tested whether situational factors of a positive event predicted participants' gratitude in the context of that event. Specifically, I examined whether independent (whether the event occurred independent versus dependent of the participant's actions) and interpersonal (whether the event was interpersonal versus non-interpersonal) predicted weekly gratitude anchored to the best event exclusively. The following predictors were included: event

coded as independent, event coded as interpersonal, an interaction term representing an event that was coded as both independent and interpersonal, and gender as a L2 covariate. Gender (females) predicted higher levels of weekly gratitude. Consistent with hypotheses, best events that were coded as independent predicted significantly higher levels of weekly gratitude compared to events coded as dependent (See Table 7). As hypothesized, best events that were coded as interpersonal also predicted significantly higher levels of weekly gratitude compared to events coded as non-interpersonal.

Additionally, a significant interaction showed that the joint combination of events coded as both independent and interpersonal predicted higher weekly gratitude following the best event, in line with hypotheses. The interaction effect was compensatory; whereas both contextual factors predict higher levels of weekly gratitude, an event that is coded as interpersonal appears to *compensate* or offset the expected lower levels of expressed gratitude in an event that is coded as dependent rather than independent (see Figure 5). Although main effects suggest that an event coded as dependent would likely be associated with lower levels of state gratitude (compared to an independent event), a participant is likely to endorse significantly higher levels of gratitude if the event also includes other people (i.e., coded as interpersonal); thus, the interpersonal factor compensates for the effects of a dependent event. Overall, as hypothesized, positive events caused by others and events that include other people are associated with higher levels of reported gratitude, compared to events caused by the individual and occur in isolation of others. Furthermore, individuals experienced the highest level of gratitude when the best event is *both* caused by someone other than themselves and involves other people.

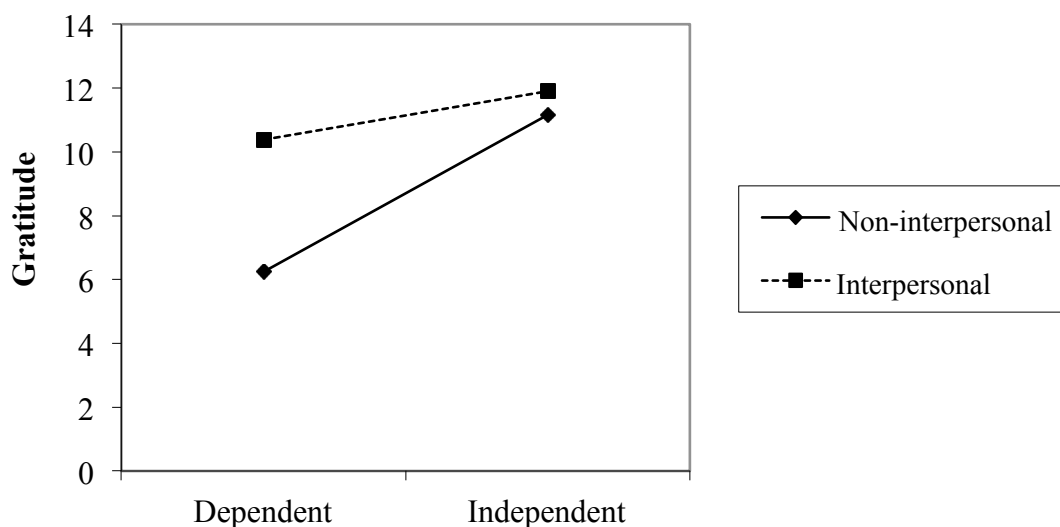


Figure 5. Situational factors predicting gratitude in the context of best events.

### Hypothesis 5: Predicting Gratitude After Worst Event

Lastly, the same situational factors predicted participants' ability to experience and report varying levels of gratitude in the context of the worst event of the week. The model tested was the same as previously described for predicting the best event with the exception of the outcome variable, which is weekly gratitude following the worst event of the week. In this model, there was no significant relationship between weekly gratitude after the worst event and events coded as independent, interpersonal, or both independent and interpersonal (See Table 7), contrary to hypotheses. There was also no effect for gender. Thus, contrary to hypotheses, the independent and interpersonal nature of the worst event did not predict varying levels of reported gratitude.

Table 7.

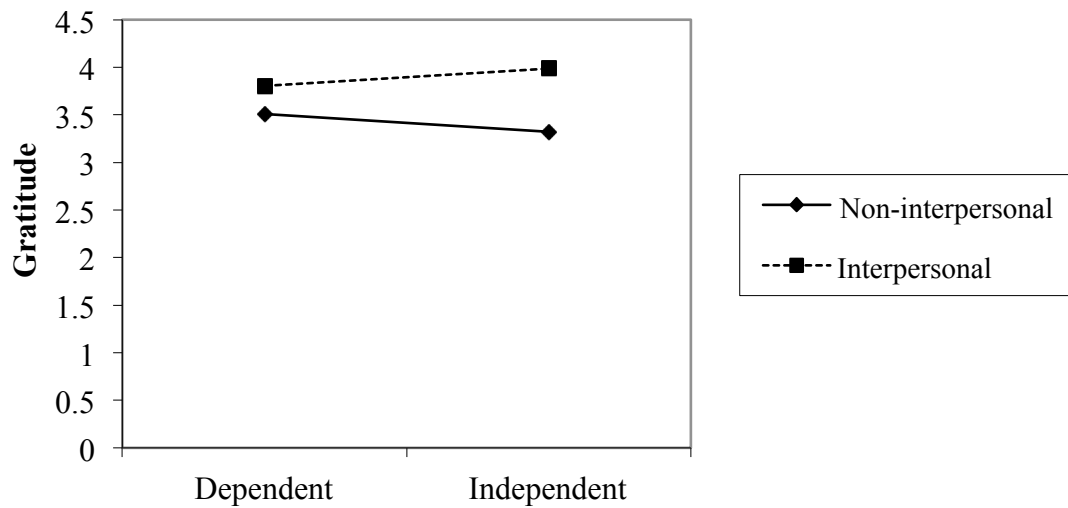
*Situational Factors Predicting Gratitude at Best and Worst Event*

	<i>B</i>	<i>SE</i>	<i>pr</i>	<i>p</i>
<u>Gratitude at Best Event: Model 4</u>				
Intercept	8.244	.775	.661	<.001
Gender	.993	.422	.191	.020
Independent	1.634	.492	.123	<.001
Interpersonal	1.193	.282	.156	<.001
Independent and Interpersonal	-.899	.449	.074	.046

Gratitude at Worst Event: Model 5

Intercept	3.655	.755	.372	<.001
Gender	.546	.420	.107	.195
Independent	-.000	.173	.000	1.000
Interpersonal	.241	.192	.047	.210
Independent and Interpersonal	.092	.161	.021	.568

*Note.* Both models used random intercepts and fixed slopes.



*Figure 6.* Situational factors predicting gratitude in the context of worst events.

## CHAPTER IV

### Discussion

#### Purpose of the Study

The first purpose of this paper is to assess the affective effects of state gratitude in positive and negative contexts in weekly life. Existing literature regarding the impact of gratitude is limited to measurements of trait gratitude or aggregated measures of gratitude across an entire day, week, or month, rather than intraindividual variability in state gratitude. Furthermore, few researchers have demonstrated the effects of gratitude in the context of events that occur in naturalistic settings, instead relying on experimental studies or correlational analyses of trait characteristics. Therefore, the results of this study offer a unique perspective on the affective outcomes of gratitude as they identify the effects in the context of specific positive and negative events. A secondary purpose of this paper is to examine how situational factors facilitate or inhibit the experience of state gratitude in naturalistic settings. Results that highlight relevant situational factors may provide useful insight into understanding how individuals can expand the frequency of feeling grateful. Therefore, this study utilized multilevel modeling across a prospective period to assess (a) the unique effects of person-centered weekly gratitude anchored to specific positive and negative events, and (b) the impact of situational factors on reported levels of gratitude following the same events.

#### Major Findings

**Gratitude and positive affect.** First, as hypothesized, person-centered weekly gratitude (i.e., higher levels than what is typical of themselves) uniquely predicted higher levels of PA in the context of the same positive event, even after accounting for a positive effect of the aggregate score of weekly gratitude. This finding is consistent with the gratitude literature, which has

repeatedly demonstrated a positive relationship between gratitude and PA at both the trait and state levels (Emmons & McCullough, 2003; Froh et al., 2009; Wood et al., 2010). Whereas these studies have been largely cross-sectional in design, this prospective study demonstrated the same effects across several months; a meaningful contribution that applies to all of the significant findings from this study. Additionally, previous researchers that assessed state gratitude typically measured gratitude across an entire day or short periods of time (i.e., not context-specific; Rossi & Pourtois, 2012). I measured gratitude and the subsequent impact on PA in the context of a specific positive event, which offers greater specificity on the effects of expressing gratitude in a naturalistic setting. Additionally, the person-centering method specifically indicates that individuals are likely to experience higher levels of PA when they endorse higher levels of gratitude than what is typical of themselves. These results highlight the effects of within-person differences of event-anchored gratitude and PA, a novel contribution to the current understanding of gratitude that also applies to the remaining significant findings from this study. Given that the analysis controlled for between-person differences in trait and stable levels of gratitude, the results also highlight the unique effect of experiencing state gratitude in a specified positive moment, regardless of an individual's propensity to experience gratitude at a stable level.

Similarly to the best event, in the context of the worst event of the week, as hypothesized, person-centered weekly gratitude uniquely predicted higher levels of PA above and beyond significant baseline depression and significant aggregate score of weekly gratitude. Specifically, participants who endorsed higher levels of gratitude than what is typical of themselves reported higher levels of PA in the context of the worst events of the week. These findings parallel the results examining this relationship in the context of the best event and consistent with extant



studies that demonstrated a significant relationship between gratitude and PA, as previously described. In addition to the unique methodological aspects of this study, these results offer a novel contribution by examining gratitude in the context of a negative naturalistic event. Previously, researchers assessed gratitude through experiments or specific intervention studies, which included gratitude in response to positive events exclusively (Rosmarin et al., 2016). Furthermore, the theory of gratitude presumes that gratitude is most likely elicited by a *positive* event, as individuals perceive themselves as benefiting from someone else. However, results from this study suggest that when gratitude was experienced during a negative event, it predicted desirable outcomes within that context. These results suggest that the gratitude can be generated or elicited even when the stimulus event is a stressor. The worst event of the week, in itself, is not likely to be perceived as an immediate benefit to the individual; however, an individual may be able to express gratitude for some aspect of that negative event that subsequently leads to increased positive affect, an unexpected benefit. Future research would benefit from exploring this relationship further by attempting to identify the specific cognitive processes and attributions related to the negative event that triggers gratitude. In this study, the unique effects of state gratitude on PA, both in the context of positive and negative naturalistic events, is an important contribution because it expands the understanding of when gratitude leads to desirable affective outcomes.

**Gratitude and negative affect.** Next, person-centered weekly gratitude did not demonstrate a significant relationship with weekly state NA in the context of the best or worst event of the week, contrary to hypotheses. Although previous researchers have demonstrated a negative correlation between trait NA and state and trait gratitude (McCullough et al., 2002; McCullough et al., 2004), others discovered no significant relationship when assessing for state-

level NA across an entire day (Emmons & McCullough, 2003; Froh et al., 2009). Similarly, high levels of trait gratitude (included as a covariate) predicted lower levels of weekly NA following the best event of the week in this study, which further supports existing literature that highlights the differential impact of trait and state gratitude on NA. Additionally, higher levels of baseline depressive symptoms predicted higher levels of NA in the context of both best and worst events, consistent with the theory that NA plays a role in the experience of depressive symptoms (Brown et al., 1998; Watson et al., 1988).

The discrepancy in which state gratitude predicted PA in both positive and negative events but not NA in either context could be explained by the fact that PA and NA often operate as two distinct dimensions (Crocker, 1997; Tellegen et al., 1999; Tuccitto et al., 2010). Therefore, the results of this study suggest that the subjective experience of gratitude may lend itself to higher PA, but not lower NA. For example, the broaden and build theory (Fredrickson, 2004) indicates that the experience of positive emotions (e.g., gratitude) facilitates a greater awareness and increased ability to experience other positive emotions (e.g., PA), possibly by activating cognitive and behavioral mechanisms which likely lead the individual to be more open to further positive experiences. Thus, it follows that person-centered weekly gratitude would be associated with subsequent higher levels of PA in both positive and negative events. In contrast, lower levels of NA (i.e., feeling peaceful and calm) are often associated with emotional regulation and the process of decreasing elevated levels of arousal, a distinct process from the activating and prosocial response associated with gratitude. Therefore, the cognitive and behavioral mechanisms associated with gratitude may not have a direct, meaningful effect on the nature of NA, at least in terms of individuals' gratitude levels as they deviate above their own average levels. Overall, the results from this study contribute to the existing literature by

identifying the differential impact of state gratitude on state PA and NA, specifically, in the context of naturalistic events.

**Gratitude and depressive symptoms.** As hypothesized, person-centered weekly gratitude in the context of a positive event predicted lower weekly depressive symptoms. Specifically, individuals who endorsed higher levels of gratitude than what is typical of themselves, in the context of the best event, reported lower depressive symptoms as measured across the entire week. These results are consistent with previous literature that showed a negative correlation between trait gratitude and stable levels of depression (Costa & McCrae, 1992; Wood et al., 2008). This study offers added evidence of that relationship while further clarifying the unique contribution of context-specific state gratitude above and beyond marginally significant trait gratitude and significant baseline depression. The results are also consistent with previous experimental and intervention studies in which participants reported lower levels of depressive symptoms after expressing gratitude linked to a positive event as elicited by the intervention or experimental manipulation (Sin & Lyubomirsky, 2009; Wood et al., 2010). This study further expands on extant studies by demonstrating similar effects between person-centered state gratitude and depressive symptoms when gratitude is experienced outside of an experimentally-manipulated environment.

Lastly, person-centered weekly gratitude in the context of a negative event did not uniquely predict lower weekly depressive symptoms when controlling for significant trait gratitude and significant baseline depression, contrary to hypotheses. These results are inconsistent with the significant relationship between weekly depression and weekly gratitude in the context of the best event of the week, in that one might expect higher levels of gratitude to be associated with lower levels of weekly depression, regardless of the context in which gratitude

was experienced. The null findings are also inconsistent with previous research that indicates state gratitude as reported overall for an entire day (McCullough et al., 2004) or elicited through a gratitude intervention (Harbaugh & Vasey, 2014; Senf & Liao, 2012) predicted significantly lower levels of depressive symptoms. However, a key distinction between these results and previous findings is the context within which gratitude was assessed: the worst event of the week. One explanation for the discrepancy is the difference between the levels of gratitude experienced after the best event ( $M = 11.09$ ) and worst event of the week ( $M = 4.69$ ). Although participants endorsed some degree of gratitude following a negative event, which was also associated with higher PA in the context of the same event, the level of gratitude may not have been high enough to impact participant's general depressive symptoms across the entire week (i.e., depressive symptoms not anchored to the same event). Nonetheless, higher levels of gratitude following a positive event may trigger positive, activating cognitive and behavioral actions that buffer against the onset of depressive symptoms across the entire week. These results are also consistent with existing studies that showed lower depressive scores following gratitude interventions, in that gratitude was elicited by positive events exclusively (e.g., list three good things; Seligman et al., 2005). Overall, this finding offers a unique contribution to the existing gratitude literature by identifying the differential effects on depression when expressing gratitude following a negative event. Additionally, this study offers novel evidence on the positive impact of person-centered weekly gratitude on weekly depressive symptoms by highlighting the unique effects in the context of a specific and naturalistic positive event.

**Independent and interpersonal factors during best event.** First, best events of the week coded as independent of participants' agency predicted significantly higher levels of gratitude following the same event, compared to those coded as dependent and controlling for

gender. In other words, individuals endorsed significantly higher levels of gratitude after a positive event occurred that was caused by someone other than themselves, in line with hypotheses. This finding is an important contribution because it offers supporting evidence for the theory of gratitude in the context of naturalistic events; specifically, these results suggest gratitude is more likely to occur when individuals perceive themselves as benefitting from a positive event that occurred independent of their own actions. These results are also consistent with previous research that indicates a key component to experiencing gratitude is a cognitive appraisal attributing the occurrence of the positive event to another individual or benefactor (Maltby, Steward, Linley, & Joseph, 2008). Whereas extant studies support the importance of this cognitive appraisal and theory of gratitude, researchers have only examined this relationship in the confines of experimental manipulations (Algoe et al., 2008; Wood et al., 2008). Therefore, this study offers novel support for the theory of gratitude by demonstrating the significant effect of independence in the context of a naturalistic setting through a repeated, prospective study design.

Next, best events of the week coded as interpersonal predicted significantly higher levels of gratitude following the same event compared to those coded as non-interpersonal. Specifically, individuals were more likely to endorse higher levels of gratitude after a positive event that involved at least one other person, consistent with hypotheses. These results are also consistent with previous research and the theory of gratitude that indicates gratitude is an other-praising emotion that involves additional persons outside the self (Algoe & Haidt, 2009). Similar to the findings regarding the independent nature of positive events, this study offers further support to existing literature by demonstrating expected effects in the context of real-life events as measured by a prospective design, beyond laboratory manipulations.

In line with hypotheses, there was a significant interaction for independence and interpersonal categories on weekly gratitude in the context of best events. Namely, individuals who reported a positive event that involved at least one other person (interpersonal) and was caused by someone beside themselves (independent) endorsed higher levels of weekly state gratitude following that event. These results offer further support that independence and interpersonal factors play a significant role in eliciting or facilitating the experience of gratitude, consistent with previous literature; however, the exact nature of the interaction was unexpected in that I hypothesized a synergistic or multiplicative effect (i.e., main effect of each predictors is enhanced under the conditions of the other predictor), not a compensatory effect. Instead, the compensatory effect suggests that although dependent events were less likely to predict gratitude (compared to independent events), an *interpersonal* positive event may still elicit higher levels of gratitude, even if the event was caused by the individual (dependent), contrary to the basic concept of gratitude. For example, an individual is likely to report high levels of gratitude for an interpersonal and dependent event such as, “I invited my friends over for dinner.” That event is considered dependent given that the individual’s actions played a significant role in the occurrence of the event; however, results from this study suggest they are still likely to endorse higher levels of gratitude because of the interpersonal nature of the event (compared to, for instance, a dependent, non-interpersonal event, e.g., “I went to dinner by myself.”). This finding suggests that the interpersonal aspect of a positive event may hold greater power in predicting an individual’s likelihood of feeling grateful, and thus, expands the understanding of what situations and cognitive appraisals are most important in the experience of gratitude. Previous researchers have yet to assess how distinct combinations of these situational factors impact the experience of gratitude after a positive event, a strength of this study. Furthermore, the examination of these

factors in the context of a positive, natural setting provides novel evidence to explain the specific situations that are more or less likely to facilitate gratitude.

**Independent and interpersonal factors during worst event.** Contrary to hypotheses and to the effects during best events, worst events of the week coded as independent did not predict significantly lower levels of gratitude than events coded as dependent. Similarly, worst events coded as interpersonal did not predict significantly lower gratitude than events coded as non-interpersonal. One possible explanation could be lower levels of variability in gratitude following the worst event of the week ( $SD = 2.82$ ) compared to gratitude after the best event of the week ( $SD = 3.37$ ); thus restricting the amount of covariance between weekly gratitude and situational factors in the context of the worst events. Additionally, no known researchers have examined gratitude in the context of negative events; therefore, it is unclear if the unexpected results are due to incorrect hypotheses or methodological confounds. For example, when individuals endorsed feeling grateful after the worst event of the week, it is possible that the grateful emotion was attributed to something unrelated to the given event and instead, directed at consequences to the negative event similar to posttraumatic growth (Tedeschi et al., 1998) in which a positive change occurs as a result of a stressor (e.g., I failed a test, but I'm grateful that happened because it forced me to study harder for my other classes). Although it is assumed that the situational factors coded in the context of the worst event have a direct association with the participants' level of gratitude, that relationship may not be as easily interpretable as the assumed benefits related to the best event of the week.

Despite the fact that the situational factors of a negative event did not predict varying levels of subsequent gratitude, gratitude in the context of that same event *did* predict the desirable outcome of increased PA, a novel contribution to the literature in it of itself, as

previously described. These results suggest that people are less likely to feel grateful under the conditions of a stressor or negative event; however, when they are able to endorse some degree of gratitude, they may experience affective benefits. Given the somewhat novel benefits of gratitude in the context of a negative event, it is important to enhance our understanding regarding if and when gratitude is likely to occur. The null findings from the analysis of situational variables indicate the type of negative event does not translate to an increased or decreased likelihood of experiencing gratitude; therefore, the situational factors of a negative event do not completely restrict an individual's ability to feel grateful and experience the subsequent benefit of PA. These results expand the understanding of how and when gratitude occurs, which leads to several clinical implications.

### **Implications**

**Clinical Implications.** Existing research on gratitude through positive psychotherapy indicates that gratitude interventions can be a useful tool to reducing distressing symptoms such as depression in both clinical (Fava et al., 2005; Seligman et al., 2006) and nonclinical populations (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011; Seligman et al., 2005; Wood et al., 2010). The results from this study offer further support for the utility of gratitude as demonstrated by the relationship between gratitude and desirable affective outcomes. Previous researchers demonstrated effects through a targeted positive psychotherapy intervention or specific gratitude exercises meant to induce gratitude, such as writing a letter of gratitude or listing three good things at the end of the day (Bolier et al., 2013; Seligman et al., 2006). This study offers novel evidence to suggest that experiencing gratitude in the context of daily or weekly life events is related to similar effects, which could be a new clinical intervention in itself, beyond existing gratitude exercises. Incorporating gratitude or encouraging grateful



cognitive appraisals in specific, natural life events could serve as a novel and effective intervention that may elicit desired outcomes. Furthermore, because the significant findings with PA and depression represent the effects of individuals deviating above their average mean level of gratitude (i.e., person-centered weekly gratitude), the results and implications could apply to a wide range of individuals. Specifically, the results suggest that anyone can experience desirable affective outcomes as long as they experience higher levels of gratitude than what is typical of themselves, independent of whether they exhibit high or low levels of trait gratitude. Overall, results from this study provide guidance for how clinicians could prescribe naturalistic gratitude interventions in different contexts and assist individuals in the awareness and appraisals needed to maximize the amount of gratitude they are likely to experience.

First, and most intuitively, clinicians could encourage individuals to express gratitude immediately following a positive event to increase the level of PA experienced in the context of that same event and to potentially decrease the level of depressive symptoms for that week. This approach is consistent with mindfulness approaches that encourage individuals to savor positive experiences in order to further elicit positive emotions (Hurley & Kwon, 2013; Quoidbach, Berry, Hansenne, & Mikolajczak, 2010), particularly for individuals who may be endorsing low levels of PA or dampening emotional responses to positive experiences, a common tendency for individuals endorsing depressive symptoms (Hudson, Harding, & Mezulis, 2015; Raes, Smets, Nelis, & Schoofs, 2012). Furthermore, information from the situational variable analysis could provide further guidance in helping individuals who strive to express gratitude more often. Results suggest that participants endorsed the highest level of state gratitude when a positive event involved someone else and was caused by someone other than the self; therefore, clinicians could encourage patients to increase awareness of the independent and interpersonal nature of

positive events they encounter on a daily basis, consistent with the existing gratitude literature. One example of a similar application is *three good things* and requiring participants to write, why those events were good. Additionally, clinicians could advise patients to assess their level of gratitude in any positive event that includes another person (i.e., not limiting gratitude exercises to events that are both independent and interpersonal exclusively) given the compensatory effect of interpersonal events.

The present findings that weekly gratitude predicted positive affect, not only in best events but also worst events of the week, have potential implications for possible interventions aiming to boost positive emotions. For example, if clinicians were able to assist patients with expressing gratitude in the context of negative events, they may experience a subsequent increase in PA. This potential, novel clinical pathway for gratitude has significant clinical implications because individuals who are seeking psychotherapy may endorse experiencing more negative or stressful events than positive events; thus, some individuals who endorse greater symptom severity may be less likely to experience the benefits of expressing gratitude after positive events because they might not be able to identify many of those events. Therefore, it may be more critical for those patients to utilize gratitude during any event, even a negative one. Furthermore, clinical levels of depressive symptoms are typically associated with low levels of PA (Brown et al., 1998); therefore, any potential increase in PA in conjunction with expressing gratitude, even if it is a mild effect, could be a worthwhile therapeutic intervention. Lastly, the null findings regarding the situational factors that predict gratitude may in fact be a good sign for the use of gratitude as a clinical intervention after a negative event. I hypothesized that individuals' ability to experience gratitude after a stressor would be restricted by the situational factors (independence and interpersonal) of that stressor. However, results indicate the likelihood of

being able to express some level of gratitude in that moment is *not* negatively impacted by whether the negative event was caused by the self or others, or occurred in isolation or with others. Thus, clinicians could encourage patients to find ways to express gratitude during any type of stressful life event as a novel way of facilitating positive emotions. This finding suggests that the clinical utility of experiencing gratitude after a stressor is not limited to a specific type of negative event. However, these possibilities remain speculative and await future studies examining the effects of gratitude in positive and negative events in clinical samples.

### **Limitations and Future Research**

Several limitations of the present study should be acknowledged. First, this study utilized several state measurements that were anchored to a specific event (gratitude, PA, and NA), rather than measure across an entire day or week, the typical use of state measurements (Rossi & Pourtois, 2012; Watson & Clarke, 1994). Although there is evidence to suggest state measurements fluctuate and can be impacted by specific events (Stawski et al., 2008; Röcke et al., 2009), few researchers have assessed the psychometric properties of *event-anchored* state measurements in comparison to the more typical use across a period of time. Therefore, the construct validity of this assessment procedure is less clear. However, there is a significant gap in the current gratitude literature in understanding the impact of expressing gratitude following a specific context or event. Therefore, although it is less common and less understood, context-specific state measurements may address an important question regarding the immediate consequences when experienced during a naturalistic setting.

A related limitation is the retrospective nature of the event-anchored measurements. Participants were required to identify the best and worst events in the past week, and then retrospectively rate gratitude, PA, and NA. Participants' recollection of different emotions may

not be a reliable assessment of the emotions experienced in the moment. As previously described, recalling emotions from a specific event may be prone to error and bias when there is a significant time delay between the targeted event and the participant's response (Scollon et al., 2003). Researchers who measure responses to naturalistic events with experience sampling methods typically restrict the amount of acceptable time lagged between event and response to 30 minutes (Cerin, Szabo, & Williams, 2001; Stone et al., 2007). In the present study, participants were asked to rate emotions anchored to a best or worst event, which could have taken place as long as seven days prior to completing the questionnaire. However, some researchers indicate that rating emotions retrospectively can also be a valid measurement when the emotion was linked to a concrete experience or moment (Algoe & Haidt, 2009; Eisenhower et al., 2004); thus, the responses to best and worst events may be equally valid given the specificity of those events and results may assist in the understanding of contextual effects between gratitude and affective outcomes. Future research could expand on these findings by assessing for the same relationships with the use of experience sampling methods that would require participants to rate their level of gratitude and other emotions immediately after an event occurs. Such research pursuits would also benefit from examining the effects on context-specific affective outcomes and assessing for effects on more stable measurements of those same outcomes, or changes of stable affect and depressive symptoms over time.

A final limitation of this study is the internal validity of coded events and the presumed relationship with event anchored gratitude. All events were coded as independent or dependent and interpersonal or non-interpersonal based on the participant's text description of the best and worst events of the week. The completed analysis tested whether the event codes predicted gratitude in the context of that specific positive or negative event. However, given the open

nature of the text responses provided by participants, it is possible that the designated code does not match the attribution made by the participant. For example, if a participant described a negative event that was coded as dependent (i.e., “I got in a fight with my friend”), they may have attributed that negative event to another individual even though they did not explicitly state the event was caused by someone else. Additionally, it is possible that the self-rated gratitude following said events was attributed to something unrelated to the event itself, as previously described. Therefore, future researchers that seek to replicate or expand on the described findings would benefit from asking participants to clearly identify who caused the positive or negative event to happen (i.e., “Who was most responsible for this event: you or someone/something else?”). This detailed information might be best collected in an interview format where an assessor could help participants isolate specific attributions and also, clearly identify the target of their experienced gratitude. Regardless, the coding procedure used for this study is consistent with previous studies that labeled events as independent or dependent and interpersonal or non-interpersonal (Cambron et al., 2009; Kercher & Rapee, 2009). Furthermore, the results for situational factors and positive events are consistent with previous studies and the theory of gratitude, suggesting this method likely holds some validity and also contributed to the current literature by identifying greater specificity with context-specific gratitude.

## **Conclusion**

Despite these limitations, the present study addresses several gaps in the current literature on gratitude regarding its impact on affective outcomes at the state-level in response to context-specific events. First, this study extends beyond extant studies of state gratitude by identifying the specific effects of within-person differences of gratitude in response to context-specific events, indicating the presence of beneficial affective outcomes for all individuals who deviate

from their own average level of gratitude. Additionally, given that the majority of existing research has shown the effects of gratitude in the context of positive events, this study provides a novel contribution by demonstrating that gratitude is associated with higher levels of PA at both positive and negative events. This study also provides further support for the relationship between gratitude and depression; specifically, offering a unique contribution by demonstrating that expressing gratitude for a specific naturalistic positive event was linked to lower levels of weekly depression. Lastly, this study offers a novel contribution to the understanding of gratitude by demonstrating that positive events characterized as independent and interpersonal appear to elicit the highest level of gratitude in that moment. Overall, this study increases our understanding of *how* and *when* gratitude leads to desirable affective outcomes in real world, naturalistic settings.

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