

Gratitude in Intermediate Affective Terrain: Links of Grateful Moods to Individual Differences and Daily Emotional Experience

Michael E. McCullough
University of Miami

Jo-Ann Tsang
Baylor University

Robert A. Emmons
University of California, Davis

Two studies were conducted to explore gratitude in daily mood and the relationships among various affective manifestations of gratitude. In Study 1, spiritual transcendence and a variety of positive affective traits were related to higher mean levels of gratitude across 21 days. Study 2 replicated these findings and revealed that on days when people had more grateful moods than was typical for them, they also reported more frequent daily episodes of grateful emotions, more intense gratitude per episode, and more people to whom they were grateful than was typical for them. In addition, gratitude as an affective trait appeared to render participants' grateful moods somewhat resistant to the effects of discrete emotional episodes of gratitude.

Throughout the history of ideas, gratitude has been defined in many ways. Adam Smith (1790/1976) defined gratitude as “the sentiment which most immediately and directly prompts us to reward” (p. 68). Similarly, Weiner and Graham (1989) defined gratitude as “a stimulus to return a favor to the other and thus reintroduce balance” (p. 403). In recognition of gratitude’s appreciative quality, Lazarus and Lazarus (1994) conceptualized gratitude as one of the “empathic emotions” that reflects recognition or appreciation of an altruistic gift. In the same vein, Emmons and Crumpler (2000) wrote, “Minimally, gratitude is an emotional response to a gift. It is the appreciation felt after one has been the beneficiary of an altruistic act” (pp. 56–57).

Gratitude may serve important functions in human beings’ social and emotional lives. Recent work has suggested that gratitude is a reliable emotional response to the receipt of benefits and that the experience and expression of gratitude may have important effects on behavior in the moral domain (McCullough, Kilpatrick, Emmons, & Larson, 2001). In addition, gratitude is associated positively with a wide variety of measures of subjective well-being (McCullough, Emmons, & Tsang, 2002). Other work has shown that gratitude is easily cultivated and is efficacious in kindling positive emotions generally (Emmons & Crumpler, 2000; Em-

mons & McCullough, 2003). These findings suggest that further work on gratitude may foster important insights into the links between personality, emotion, social life, and psychological well-being.

Gratitude at Three Levels of Affective Experience

Gratitude, like all affects, manifests itself in several forms with distinct psychological properties. Rosenberg (1998) proposed that the common forms of affective experience could be structured into three hierarchical levels of analysis: affective traits, moods, and emotions.

Gratitude as Affective Trait

Rosenberg (1998) placed affective traits at the top of the hierarchy of affective phenomena. She defined *affective traits* as “stable predispositions toward certain types of emotional responding” that “set the threshold for the occurrence of particular emotional states” (p. 249). For example, hostility is thought to lower one’s threshold for experiencing anger. In the same way, there is a “grateful disposition” that may reduce people’s threshold for experiencing grateful emotions (McCullough et al., 2002). People who score highly on measures of gratitude as an affective trait tend to experience a high degree of life satisfaction and positive affects such as happiness, vitality, and hope. They also experience relatively low levels of negative affects such as resentment, depression, and envy (see also Watkins, 2004). Finally, McCullough et al. (2002) found that people who scored highly on measures of gratitude also scored higher on measures of prosocial behavior, empathy, forgiveness, religiousness, and spirituality. Among the Big Five, the grateful disposition seems related most strongly to Agreeableness (positively) and Neuroticism (negatively).

Michael E. McCullough, Department of Psychology, University of Miami; Jo-Ann Tsang, Department of Psychology and Neuroscience, Baylor University; Robert A. Emmons, Department of Psychology, University of California, Davis.

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Correspondence concerning this article should be addressed to either Michael E. McCullough, Department of Psychology, University of Miami, P.O. Box 248185, Coral Gables, FL 33124-0751, or Robert A. Emmons, Department of Psychology, University of California, One Shields Avenue, Davis, CA 95616. E-mail: mikem@miami.edu or raemmons@ucdavis.edu

Gratitude as an Emotion

Gratitude can also manifest itself on the level of *emotions*, which Rosenberg (1998) defined as “acute, intense, and typically brief psychophysiological changes that result from a response to a meaningful situation in one’s environment” (p. 250). McCullough et al. (2001) reviewed data from several studies to conclude that people experience the emotion of gratitude most consistently and strongly when they perceive themselves to be recipients of an intentionally rendered benefit that is both valuable to the beneficiary and costly to the benefactor. In addition, McCullough et al. (2001) posited that the emotion of gratitude has a specific action tendency, which is “to contribute to the welfare of the benefactor (or a third party) in the future” (p. 252). Indeed, grateful emotions appear to motivate people to reciprocate the benefits they have received by rendering further benefits. This action tendency is adequately distinct from the action tendencies associated with indebtedness (Greenberg, 1980; see also Gray, Emmons, & Morrison, 2001). For example, people who are asked to describe a situation in which they felt grateful report having experienced more desire to respond generously toward their benefactor and less desire to avoid the benefactor than do people who are asked to describe a situation in which they felt indebted (Gray et al., 2001).

Gratitude as a Mood: Intermediate Affective Terrain

Rosenberg (1998) considered “moods,” which “wax and wane, fluctuating throughout or across days” (p. 250), as subordinate to affective traits but as superordinate to discrete emotion episodes. Moods comprise a stable component that is attributable in part to individual differences among persons (i.e., some people experience more gratitude than others as the affective background of their day-to-day lives, just as some people are more prone to, say, sadness or anxiety as the affective background of their daily lives). However, mood also varies across days as a function of the events that occur to people each day and their discrete emotional reactions to those events. Thus, mood may be an important nexus where affective traits and short, intense experiences of discrete emotions might be expected to exert some of their most interesting effects, both additively and jointly.

Moods are subtle and less accessible to conscious awareness than are emotions (i.e., one is less likely to be aware of gratitude as a mood than as an emotion). Despite their subtlety relative to emotions, however, moods are important because they are expected to have broad, pervasive effects on consciousness that emotions simply cannot because of their relatively short duration (Rosenberg, 1998). To be sure, emotions have powerful effects on consciousness, but these effects are usually goal directed and dissipate after the goals that are associated with the motivation (e.g., the motivation to repay or praise a benefactor, which may be the primary goal of grateful emotions; McCullough et al., 2001) have been fulfilled. In contrast, the relatively long duration of moods might allow them to influence information processing, physiological reactivity, and other psychological phenomena over relatively long arcs of time. Indeed, many of the presumed social effects of gratitude, such as readiness to be helpful and supportive to others (McCullough et al., 2002), as well as psychological effects of gratitude, such as better coping with stress, are probably caused not by gratitude as an emotion, because the duration of emotions is far too short, but rather, by gratitude as a mood.

Therefore, to understand how gratitude may exert many of its presumed effects on people’s social and psychological lives, it would be useful to understand better how people experience grateful moods in daily life. However, a systematic exploration of gratitude in this “intermediate terrain between affective traits and emotions” (Rosenberg, 1998, p. 250) is conspicuously absent from the existing literature.

Personality and Daily Experience as Determinants of Gratitude in Daily Mood

Because daily mood occupies intermediate terrain between affective traits and emotional reactions to discrete daily life events, it is likely that individual differences and daily events work in concert to determine the extent to which people experience grateful moods on any given day (Rosenberg, 1998). But to which individual differences might grateful moods be related? To which daily events? Moreover, how might individual differences and daily events work in concert to promote gratitude in daily mood experience? In the preceding paragraphs, we proposed that the amount of gratitude that people experience in their moods across days can be decomposed into (a) stable interindividual differences reflecting people’s typical levels of grateful mood and (b) their day-to-day fluctuations around those mean levels. Both of these components, we argue, are important aspects of mood, even though this decomposition implies that the components will have different correlates. Namely, the stable individual-differences component can only be correlated with characteristics of persons (i.e., personality and affective traits), whereas the day-to-day fluctuations can only be correlated with characteristics that also fluctuate over time (e.g., day-to-day changes in gratitude-relevant life events, or the interactions of personality traits with characteristics that fluctuate over time).

Which Traits Are Associated With Mean Levels of Gratitude in Daily Mood?

We anticipate that people’s mean levels of gratitude in their daily moods are reliably associated with measures of gratitude as a disposition or affective trait (e.g., McCullough et al., 2002), because the disposition toward gratitude is presumably a personality-based proneness to experience grateful affect (including moodlike manifestations of affect). Although this proposition may seem trivial, demonstrating a link between the affective traits that supposedly predispose people to experience grateful moods and the stable, traitlike component of those grateful moods themselves is an important test of Rosenberg’s (1998) hierarchical model of affective experience (at least vis-à-vis gratitude). Moreover, the inability of such measures to predict gratitude in daily mood would cast doubt on the construct validity of those measures and on gratitude theory.

Other personality and affective correlates of people’s mean levels of gratitude in their daily moods are probably a subset of the traits that McCullough et al. (2002) found to be correlated with self-reports and peer reports of gratitude as an affective trait. McCullough et al. demonstrated that people with high scores on measures of life satisfaction and trait positive affect score higher on measures of gratitude as an affective trait. This may be in part because such traits have a common dispositional core (e.g., high

Extraversion/low Neuroticism) that inclines (or, in the case of negative affect, disinclines) people to experience positive affects of all sorts, including gratitude. McCullough et al. also found that gratitude as an affective trait was correlated positively with self-report measures of prosocial traits such as empathy and perspective taking and was correlated negatively with envy, perhaps partially because these traits share a common dispositional substrate (e.g., Agreeableness).

McCullough et al. (2002) demonstrated further that measures of religious involvement and spirituality were correlated with gratitude as an affective trait. These latter correlations may reflect the fact that people who are highly religious or spiritual tend to perceive positive circumstances in their lives that are not caused by human action (e.g., eyesight, a sunny day) as nevertheless resulting from the intentional behavior of a benevolent moral agent (i.e., God or a higher power). In contrast, less religious or spiritual individuals might attribute these same events as due to chance and therefore be less inclined to feel grateful in response. Insofar as the correlations between gratitude and religiousness or spirituality reflect real differences in the affective experiences of more versus less religious or spiritual people, these correlations should also manifest themselves when gratitude is measured at the level of daily mood.

What Discrete Daily Experiences Are Associated With Gratitude in Daily Mood?

To the extent that gratitude in people's daily moods is built "from the ground up" on the basis of people's daily gratitude-relevant experiences and their short-term emotional reactions to them, people who experience more grateful mood on a given day than is typical for them should also report (a) more events on that day for which they are grateful, (b) more people to whom they felt grateful, and (c) more intense gratitude on that day in response to these discrete daily events than is typical for them.

How Does the Grateful Disposition Interact With Daily Emotional Experience?

In her depiction of the relationships among affective traits, moods, and emotions, Rosenberg (1998) focused almost exclusively on the bivariate associations among these three levels of affect—for example, how affective traits and emotions might individually influence mood. However, individual differences and daily experiences might also operate interactively to determine grateful moods. Gratitude-relevant events (and fleeting emotional reactions to them) may have a different influence on daily moods for people who are strongly disposed to experience gratitude in comparison with people who are weakly disposed to experience gratitude. We propose two rival hypotheses regarding how the grateful disposition and daily experience might interact to determine grateful moods (see also Affleck, Tennen, Urrows, & Higgins, 1992, who posed a similar doublet of rival hypotheses).

The Conductance Hypothesis

The conductance hypothesis states that the moods of people who are highly disposed toward gratitude are particularly responsive to the emotional effects of gratitude-relevant daily life events and

their own discrete emotional responses to these daily events. In other words, individuals who score high on measures of gratitude as an affective trait should report many discrete events that cause them to feel grateful, should experience gratitude to a large number of people, and should feel more intense episodes of grateful emotion in response to these gratitude-relevant daily life events. According to the conductance hypothesis, the disposition toward gratitude fosters causal dependence between emotions and moods: For dispositionally grateful people, their emotional reactions to gratitude-relevant daily events are conducted "upward" so that their more pervasive and long-lasting moods throughout the day are colored by their daily emotional experience.

Stated another way, according to the conductance hypothesis, grateful emotions put dispositionally grateful people into a grateful mood. Conversely, for people who are lower in the disposition toward gratitude, gratitude-relevant daily life events (and emotional reactions of gratitude) are not effectively conducted upward to influence mood. For them, discrete emotional experiences of gratitude do not lead to grateful moods as strongly or reliably.

The conductance hypothesis is reminiscent of Larsen and Ketelaar's (1991) findings that affective traits such as Extraversion and Neuroticism have specific effects on people's reactions to emotionally valenced life events. Larsen and Ketelaar found that Extraversion appears to moderate the link between laboratory events known to induce positive affect and ratings of positive emotion in response. That is, for extroverts, the effects of positive mood inductions were stronger than they were for introverts. Similarly, Neuroticism appeared to moderate the relationship between negative events and negative emotions. In similar work, Suls, Martin, and David (1998) found that highly agreeable people experience more negative affect in response to conflict events than do less agreeable people, although there was no difference in the affective responses of more agreeable and less agreeable people to nonconflict events in daily life.

The Resistance Hypothesis

According to the resistance hypothesis, for people who are dispositionally prone to feel grateful, the amount of gratitude in their daily moods is determined so thoroughly by personality processes that their moods are resistant to the effects of gratitude-relevant daily life events (e.g., experiencing many discrete gratitude-eliciting events; experiencing gratitude to a large number of people) and their discrete emotional responses to these daily events (i.e., feeling intense episodes of grateful emotion in response). Conversely, according to the resistance hypothesis, people with a weaker disposition toward gratitude experience gratitude in their daily moods only insofar as they experience high numbers of the social-psychological events that typically elicit gratitude and strong amounts of grateful emotion in response to those daily events. In this view, less dispositionally grateful people's daily grateful moods are more dependent on discrete emotion episodes than are those of more dispositionally grateful people.

In support of the resistance hypothesis, Affleck et al. (1992) found that among patients with rheumatoid arthritis, people with the highest levels of Neuroticism showed the weakest links between their daily pain ratings and negative affect in daily mood. However, most research to date that bears on the conductance and resistance hypotheses would seem to support the conductance

hypothesis (e.g., Larsen & Ketelaar, 1991; Suls et al., 1998), although few if any studies have examined these two hypotheses in the context of discrete affective traits, emotions, and moods such as gratitude (or anger, or fear, etc.).

Overview of the Studies

In the remainder of the present article, we describe two studies in which we explored the nature of gratitude in people's daily moods. In Study 1, we began by examining the relationship of people's typical levels of gratitude in daily mood with a variety of personality and affective traits. In Study 2, we extended Study 1 and examined the relationship of the day-to-day fluctuations in grateful mood with day-to-day fluctuations in gratitude-relevant daily life events (e.g., experiencing many discrete events that cause gratitude; experiencing gratitude to a large number of people), and people's discrete emotional reactions (i.e., gratitude) in response to those daily events. In Study 2, we also evaluated the conductance and resistance hypotheses.

In conducting these two studies, we worked with two very different samples of participants. The first study involved patients at a university hospital who had neuromuscular disorders, whereas the second study involved undergraduate students. The use of these two samples was helpful for examining the extent to which our findings about the nature of gratitude in daily mood generalized across at least two interesting facets of human diversity (e.g., adults vs. late adolescents; people with chronic illness vs. physically healthy people).

Study 1

Method

Participants

Participants were 96 adults (67 women and 29 men; mean age = 49 years, range = 22–77) with either congenital or adult-onset neuromuscular diseases (NMDs). These participants were obtained from a larger group of 153 participants drawn from a mailing list compiled by the University of California, Davis, Medical Center Neuromuscular Disease Clinic. The majority had one of three NMDs: post-polio, Charcot-Marie-Tooth, or fascioscapulohumeral (for more information about neuromuscular disease, see <http://www.rehabinfo.net>). Fifty-four percent of the participants were married, 42% had college or postgraduate degrees, and their mean annual income was between \$15,000 and \$25,000 (for more details about this sample, see Emmons & McCullough, 2003).

Measures: Pre diary Questionnaires

Approximately 1 year prior to completing the daily diaries, the 153 participants completed a 28-page survey including the self-report measures described below. They received \$40 compensation for completion of this 28-page survey.

Gratitude Questionnaire: 12-item form (GQ-12). The GQ-12, an early version of the Gratitude Questionnaire 6-item form (GQ-6; McCullough et al., 2002), consists of 12 self-report items (e.g., "I feel a profound sense of appreciation") that participants endorse on a 7-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*) to indicate how well they describe "your feelings about your life as a whole." In this sample, the GQ-12 had an internal consistency reliability of $\alpha = .83$, and was correlated with the GQ-6 (which participants completed 1 year later; see below) at $r = .72$ ($p < .001$).

Satisfaction with life. The 5-item Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) assesses the cognitive component of subjective well-being. Items (e.g., "In most ways my life is close to ideal") are rated on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*). In previous work, the SWLS had a 2-month test-retest correlation coefficient of $r = .82$, and coefficient alpha = .87 (Diener et al., 1985).

Campbell Well-Being Scale. The Campbell Well-Being Scale consists of nine semantic differential scales (e.g., *boring-interesting*, *miserable-enjoyable*, *discouraged-hopeful*) that provide an overall index of general well-being (Campbell, Converse, & Rodgers, 1976). The scale correlates with other measures of well-being and has acceptable internal consistency reliability (Beckie & Hayduk, 1997).

Optimism. The widely used Life Orientation Test (LOT; Scheier, Carver, & Bridges, 1994) is an eight-item scale for assessing dispositional optimism. Scheier et al. (1994) reported an internal consistency reliability of $\alpha = .82$ and test-retest stabilities ranging from .56 to .79 across four time periods.

Depressive symptoms. Participants also completed the Center for Epidemiologic Studies Depression Scale (Radloff, 1977). Participants used a 4-point Likert-type scale (1 = *Rarely or none of the time [less than 1 day]* and 4 = *most or all of the time [5–7 days]*) to indicate how often during the last week they experienced each of 20 affective and somatic symptoms that characterize major depressive episodes. Total scores are the sums of scores from all 20 items. Radloff (1977) reported test-retest stabilities ranging from $r = .67$ (4 weeks) to $r = .32$ (12 months). Internal consistency was estimated as $\alpha = .90$ (Radloff, 1977).

Positive affectivity (PA) and negative affectivity (NA). The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) measures general tendencies to experience positive (e.g., "proud") and negative (e.g., "guilty") affect. Participants used a 5-point Likert-type scale (1 = *very slightly or not at all*; 5 = *extremely*) to indicate how well each of 20 adjectives described "how they generally feel." Coefficient alphas of the positive and negative scales range in the mid- to upper .80s (Watson et al., 1988).

The Big Five Inventory (BFI). The BFI (John, Donahue, & Kentle, 1991) consists of 44 brief descriptive phrases that are prototypical markers of the Big Five factors of personality: Agreeableness, Conscientiousness, Extraversion, Neuroticism, and Openness. Alpha reliabilities and test-retest reliabilities for the five subscales range from .80 to .90 (John & Srivastava, 1999).

Spiritual transcendence. The Spiritual Transcendence Scale (Piedmont, 1999) is a 24-item scale consisting of subscales for assessing three dimensions of spirituality: prayer fulfillment, universality, and connectedness. In the present study, we used the total scale score as a measure of spirituality.

Diary Measures: Gratitude in Daily Mood

Approximately 1 year after completing the pre diary questionnaires, 98 of the original 153 participants were enrolled in a 21-day mood diary study. Participants rated the intensity with which they felt each of a variety of emotions each day for 21 consecutive days. Participants were instructed to "Indicate to what extent you felt this way during the day today" using a 5-point Likert-type scale (1 = *very slightly or not at all*; 5 = *extremely*). We measured the amount of gratitude in participants' daily moods via their mean score on three gratitude-related emotion words (*grateful*, *thankful*, and *appreciative*) as in Emmons & McCullough (2003). Across the 21 days, the mean internal consistency for this three-item composite was $\alpha = .92$.

Postdiary Measure of the Disposition Toward Gratitude

Approximately 1 month after completing the 21-day diaries, participants completed a second packet of questionnaires. This packet of questionnaires

included the GQ-6 (McCullough et al., 2002), which is a self-report measure of the frequency and intensity with which people experience gratitude. Sample items include “I have so much in life to be thankful for,” and “I am grateful to a wide variety of people.” Items are endorsed on a 7-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*). McCullough et al. (2002) reported internal consistency reliabilities in the range of $\alpha = .80$. Confirmatory factor analyses showed that the measure has a robust one-factor structure and is distinct from many measures of subjective well-being.

Procedure

Participants were mailed 21 daily recording forms, instructions, and business reply envelopes for mailing their forms directly back to the researchers. They were told that their daily ratings were meant to summarize the day as a whole, and therefore they should try to complete them as late in the day as possible but before being too sleepy to complete them accurately. The daily form took approximately 5 min to complete each evening. Participants were asked to mail in their forms once a week. Finally, they were told that should they forget to fill out a form, it was better to omit the form for that day rather than to complete it from memory.

Participants were paid \$20 if they completed all of the forms; they were paid \$15 if they failed to complete all 21 forms. Of the 98 participants initially recruited, 96 of them returned usable mood diary data. These data collection methods and compliance rates compare favorably with those from other recent studies (e.g., Gable, Reis, & Downey, 2003). All but 3 of the 96 participants who returned usable mood diary data also completed the postdiary packet of questionnaires. For the 3 individuals who did not, we imputed values for their GQ-6 scores using the expectation-maximization routine.

Analyses

We used a two-level modeling strategy with the HLM 5 statistical software package (Raudenbush, Bryk, Cheong, & Congdon, 2000). HLM enabled us to fit simultaneously both (a) within-person longitudinal models and (b) between-person models that accounted for individual differences in the parameters of the within-person models.

Within-person (Level 1) models. Consistent with our view that gratitude in daily mood comprises (a) a stable component that is consistent for each individual across the 21-day period but that varies across persons and (b) a component reflecting day-to-day variations in the amounts of gratitude that people experience in their daily moods, we decomposed people’s 21 daily gratitude mood ratings into within-person (or Level 1) models that took the form

$$GMR_{ij} = \beta_{0j} + \beta_{1j}(\text{day}) + r_{ij}, \tag{1}$$

where GMR_{ij} = Person j ’s gratitude mood rating (i.e., their score on the three-item composite) on Day i ; β_{0j} = Person j ’s mean level of gratitude in daily mood across the 21 days (centered on the first day of the study); $\beta_{1j}(\text{day})$ = the effect of linear change (measured in days) on Person j ’s gratitude mood ratings; and r_{ij} reflects an occasion-specific residual variance in GMR_{ij} , or the extent to which Person j experienced more or less gratitude on Day i than was typical for him or her (Nezlek, 2001). Although we had no theoretical reason to expect change in the amount of gratitude in participants’ daily moods over the 21 days, we have found in other work (McCullough, Emmons, Kilpatrick, & Mooney, 2003) that people’s scores on some variables decay with repeated assessments, perhaps because of habituation to the rating task over the 21-day period (the rate of change was also free to vary across participants).

Between-person (Level 2) models. The between-person (or Level 2) models were attempts to account for individual differences in the Level 1 beta coefficients (i.e., the random coefficients that accounted for between-

persons differences in initial status and linear change). These models took the form

$$\beta_{0j} = \gamma_{00} + \gamma_{01}X_{01j} + u_{0j}. \tag{2}$$

Equation 2 specifies estimation for β_{0j} , which captures individual differences in initial status (i.e., mean levels of gratitude in daily mood across the 21-day period). γ_{00} = the mean initial status estimate on the three-item gratitude composite for the entire sample, γ_{01} = the strength of the relationship between the between-persons differences in mean levels of gratitude in daily mood and another measured between-subjects variable X_{01} , X_{01j} = Person j ’s score on X_{01} , and u_{0j} is a residual reflecting between-persons differences in mean levels of gratitude in daily mood that are not accounted for by γ_{00} and the between-subjects predictor variables. Using this modeling approach, we conducted a series of univariate analyses in which several personality and affective traits were used individually as between-subjects predictors of mean levels of gratitude in participants’ daily moods. We expressed these relationships with t statistics and accompanying p values and also converted the t values to effect size rs , calculated as

$$r = t/(t^2 + n - 2)^{1/2}. \tag{3}$$

For an explanation of the derivation of this formula, see Hunter and Schmidt (1990, p. 272).

Results and Discussion

Means, standard deviations, and reliabilities for major study variables appear in Table 1.

Longitudinal Trajectories of Gratitude in Daily Mood Ratings

Per the linear change model specified in Equation 1, participants began the study feeling above the midpoint on gratitude (coefficient = 3.47, $SE = 0.09$). Because the scores on the three-item

Table 1
Means, Standard Deviations, and Reliability Estimates for Major Variables, Study 1

Variable	Range	<i>M</i>	<i>SD</i>	Reliability
Gratitude in daily mood	1–5	3.47	0.85	.84 ^a
GQ-12	1–7	5.68	0.65	.83
GQ-6	1–7	5.93	0.96	.87
Life satisfaction	1–7	4.01	1.40	.85
Optimism	1–5	3.65	0.85	.83
Well-being	1–7	4.90	1.08	.90
Positive affect	1–5	3.47	0.63	.87
Negative affect	1–5	2.09	0.72	.90
Depression	0–4	1.72	0.39	.85
Spiritual transcendence	1–5	3.60	0.47	.91
Big Five				
Openness	1–5	3.84	0.56	.78
Conscientiousness	1–5	3.98	0.59	.78
Extraversion	1–5	2.96	0.67	.81
Agreeableness	1–5	4.08	0.46	.66
Neuroticism	1–5	2.81	0.82	.86

Note. $N = 96$. GQ-12 = Gratitude Questionnaire, 12-item form. GQ-6 = Gratitude Questionnaire, 6-item form.

^a Initial status parameter only. Reliability calculated as percentage of true parameter variance per Bryk and Raudenbush (1992). All other reliabilities estimated with Cronbach’s alpha.

gratitude composite ranged from 1–5, a score of zero was not possible. As a result, null hypothesis tests for this coefficient are not informative, so we do not report them here.

Over the course of the study, participants reported feeling slightly less grateful each day (coefficient = -0.02 , $SE = 0.004$), $t(95) = -4.55$, $p < .001$. In other words, scores on the three-item measure of gratitude in daily mood decreased, on average, .02 units per day. These group trends notwithstanding, participants manifested considerable variance in both initial status (variance = 0.73 , $p < .001$) and linear change (variance = 0.001 , $p < .001$). The two Level 1 parameters (initial status and linear change) accounted for 64% of the variance in people's reports of gratitude in their daily moods. Because participants varied considerably on these two parameters, it was reasonable to search for variables that could account for individual differences in both initial status and linear change. Almost without exception, individual differences in linear change were not significantly related to the affective and personality traits examined herein, so we do not report those associations in the present article. There was also no gender difference in initial status or linear change estimates ($ps > .50$).

Correlations of Dispositional Measures With Typical Levels of Gratitude in Daily Mood

First, we examined whether self-report measures of gratitude as an affective trait were associated with the mean amounts of gratitude in participants' daily moods (i.e., as indexed by their Level 1 initial status parameter estimates, as with all analyses reported below). Both the GQ-12 as an affective trait (coefficient = 0.72 , $SE = 0.19$), $t(94) = 3.87$, $p < .001$, and the GQ-6 (coefficient = 0.45 , $SE = 0.12$), $t(94) = 3.85$, $p < .001$, were positively and significantly related to individual differences in the mean levels of gratitude in people's daily moods (effect size $rs = .37$). People who perceived themselves as highly disposed to experience gratitude did indeed experience higher levels of gratitude in their daily moods throughout the 21 days.

Correlations With Other Personality and Affective Traits

Several other personality and affective traits predicted mean levels of gratitude in participants' daily mood ratings. As can be seen in Table 2, people with high levels of life satisfaction, well-being, optimism, and PA reported higher mean levels of gratitude across the 21 days than did their counterparts who had lower scores on these traits. Conversely, people high in self-reported depressive symptoms (but not NA) reported lower mean levels of gratitude in their daily moods across the 21-day period than did people who were lower in self-reported depressive symptoms.

As expected, spiritual transcendence was positively correlated with the mean levels of gratitude in participants' daily moods (coefficient = 0.60), $t(94) = 3.32$, $p < .01$ ($r = .33$). Among the Big Five (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism), only Extraversion (coefficient = 0.54), $t(94) = 4.01$, $p < .001$ ($r = .38$) was significantly correlated with the mean levels of gratitude in participants' daily moods across the 21-day period.

Table 2
Correlations of Personality and Affective Traits With Initial Status Parameters for Gratitude in Daily Moods, Study 1

Personality measure	Coefficient	SE	$t(94)$	r
Affective trait measures of gratitude				
GQ-12	0.72	0.19	3.87***	.37
GQ-6 (postdiary)	0.45	0.12	3.85***	.37
Life satisfaction and affectivity				
Satisfaction With Life	0.22	0.07	3.20**	.31
Well-Being	0.27	0.10	2.74**	.27
Optimism	0.40	0.17	2.38*	.25
Depression	-0.68	0.31	-2.21*	-.22
Positive Affectivity	0.61	0.15	4.11***	.39
Negative Affectivity	-0.18	0.13	-1.38	-.14
Religious/spiritual variables				
Spiritual Transcendence	0.60	0.18	3.32**	.33
The Big Five				
Openness	0.09	0.14	0.69	.07
Conscientiousness	0.14	0.14	1.02	.11
Extraversion	0.54	0.14	4.01***	.38
Agreeableness	0.40	0.25	1.61	.16
Neuroticism	-0.21	0.11	-1.87	-.19

Note. GQ-12 = Gratitude Questionnaire, 12-item form. GQ-6 = Gratitude Questionnaire, 6-item form.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Associations of Gratitude as an Affective Trait With Gratitude in Daily Mood, Controlling for Higher Order Personality and Affective Traits

Given the pervasive influences of Extraversion–PA and Neuroticism–NA on social and emotional experience (Gross, Sutton, & Ketelaar, 1998; Larsen & Ketelaar, 1991) and their associations with gratitude herein and in previous work (McCullough et al., 2002), we estimated the associations of our two measures of gratitude as an affective trait with mean levels of gratitude in daily mood while statistically controlling for the Big Five as well as trait PA and NA. When we included these additional variables with the GQ-6 measure of gratitude as an affective trait, the association of the GQ-6 with individual differences in mean levels of gratitude in daily mood across the 21 days remained statistically significant (coefficient = 0.33 , $SE = 0.12$), $t(87) = 2.62$, $p = .009$ (effect size $r = .26$). Similarly, the association of the 12-item measure of gratitude as an affective trait with individual differences in mean levels of gratitude in daily mood remained significant (coefficient = 0.59 , $SE = 0.18$), $t(87) = 3.29$, $p = .001$ (effect size $r = .32$). Thus, the association of gratitude as an affective trait with the typical amount of gratitude that participants experienced in their daily mood ratings could not be explained solely in terms of the Big Five, trait PA, and trait NA.

Summary

In Study 1 we examined the associations of several personality and affective traits with individual differences in the

amounts of gratitude that people typically experienced in daily mood. People who scored high on trait measures of positive emotion and subjective well-being experienced higher mean levels of gratitude in their daily moods than did people who scored lower on such measures. Among the Big Five, Extraversion appeared to be the strongest predictor of the typical amounts of gratitude in people's daily moods. This relationship between the Big Five and grateful mood in some ways mirrors the relationship between gratitude as an affective trait and the Big Five. McCullough et al. (2002) found associations between the Big Five dimensions Extraversion, Agreeableness, and Neuroticism and measures of gratitude as an affective trait. The additional associations of Agreeableness and Neuroticism found with gratitude as an affective trait may be due to differences between gratitude as an affective trait and gratitude as a mood or to the unique nature of the sample used in the present study (adults with neuromuscular diseases).

People with high levels of spiritual transcendence (Piedmont, 1999) also experienced higher mean levels of gratitude in their daily moods than did people lower in spiritual transcendence. These findings corroborate McCullough et al.'s (2002) findings regarding the spiritual correlates of gratitude, here extended to the realm of daily mood. In addition, Study 1 shows that two measures of gratitude as an affective trait, which should partially set people's typical levels of gratitude in daily mood (Rosenberg, 1998), were indeed correlated with mean levels of gratitude in daily mood, with effect size correlations of $r = .37$.

The findings of Study 1 led to four other questions. First, because Study 1 involved adults with chronic physical health problems, we wondered whether the results from Study 1 would emerge also in a sample of basically healthy university students. Second, the correlations of the Big Five with gratitude in daily mood in Study 1 differed somewhat from what we have found in earlier work in which we assessed gratitude as an affective trait (McCullough et al., 2002). We wondered if this divergence from previous results was due to differences in the assessment of gratitude or to the nature of the sample used in Study 1. Third, we wished to explore the association of gratitude in daily mood with a wider variety of spiritual and religious constructs.

Fourth, we wanted to explore how gratitude in daily mood might be shaped not only by personality and affective traits but also by the gratitude-inducing events that people experience and their emotional reactions to them. In this context, we also wished to test the conductance and resistance hypotheses. We investigated these questions in Study 2.

Study 2

Method

Participants

Participants were 112 students (84 women, 27 men, 1 unrecorded) in an undergraduate psychology course at Southern Methodist University (age range = 18–44 years, $M = 20.54$). Most participants were European American (85). Smaller numbers of individuals classified themselves as Latino/a American (13), African American (7), and Asian American (4), with 3 individuals declining to state their ethnicity. Participants received course credit for participating.

Measures: Pre-diary Questionnaires

Prior to completing the daily mood diaries, participants also completed a packet of questionnaires containing several measures of personality and affective traits.

Measures from Study 1. As in Study 1, participants completed the GQ-6, the SWLS, the PANAS, and the BFI.

Disposition toward gratitude. Participants also indicated their general disposition toward gratitude by indicating the extent to which they generally felt each of three gratitude-related emotions (using the three adjectives *grateful*, *thankful*, and *appreciative*), using a 5-point Likert-type scale (1 = *very slightly or not at all*; 5 = *extremely*). In previous work, this three-item adjective measure was highly correlated ($r = .65$ before correcting for measurement error; $r = .75$ after correcting for measurement error via structural equation modeling) with the GQ-6 (McCullough et al., 2002).

Measures of religiousness and spirituality. Participants completed several measures of religiousness and spirituality. First, they completed a single-item measure of religious interest (1 = *Not at all interested*; 9 = *Extremely interested*). They also completed an eight-item measure of general religiousness (for details on these eight items, see McCullough et al., 2002, p. 116). This composite measure had an internal consistency reliability estimate of $\alpha = .88$.

We measured religious orientation using Allport and Ross's (1967) Intrinsic and Extrinsic Religious Orientation Scales and Batson's Quest Scale (Batson & Schoenrade, 1991). The intrinsic scale measures the extent to which religion is an individual's "master motive" in life, whereas the extrinsic scale measures the use of one's religion as a means for reaching other, nonreligious ends such as comfort or status (Allport & Ross, 1967). The quest scale measures the extent to which an individual conceptualizes religion as an open-ended search. These scales essentially measure the functional nature of an individual's religion; therefore, it is necessary to include only those participants that categorize themselves as religious to begin with. For this reason, we conducted analyses involving these scales only with the 85 participants that indicated at least a moderate interest in religion (marked 3 or higher on the item "How interested are you in religion?" on a scale from 1 = *Not at all* to 9 = *Extremely*). The intrinsic, extrinsic, and quest scales had reliability estimates of $\alpha = .89$, $.69$, and $.83$, respectively, in this sample.

In addition, participants completed a 15-item version of the Self-Transcendence subscale of the Character and Temperament Inventory (Cloninger, Svrakic, & Przybeck, 1993). This measure assesses three aspects of spirituality: Self-forgetful versus self-conscious experience, transpersonal identification versus self-isolation, and spiritual acceptance versus rational materialism. Kirk, Eaves, and Martin (1999) developed a 15-item form of the full-length 33-item subscale. Cloninger et al. (1993) reported alpha in the low .70s for the 33-item version. In McCullough et al.'s (2002) study, internal consistency of the 15-item version was $\alpha = .86$. Items were endorsed on a 4-point Likert-type scale (1 = *agree*; 4 = *disagree*). (Analyses using the Self-Transcendence subscale included all participants regardless of their religious interest.)

Dispositional empathy. The tendency to experience empathy for others was measured with the widely used Empathic Concern and Perspective-Taking subscales of the Interpersonal Reactivity Index (Davis & Oathout, 1987). These subscales have adequate internal consistency (α s = $.73$ and $.71$, respectively; Davis & Oathout, 1987).

Envy. We measured envy with R. H. Smith, Parrott, Diener, Hoyle, and Kim's (1999) eight-item Dispositional Envy Scale. Items (e.g., "Frankly, the success of my neighbors makes me resent them") were rated on a 5-point Likert-type scale (1 = *strongly disagree*; 5 = *strongly agree*). R. H. Smith et al. reported internal consistency reliability estimates in the range of $\alpha = .83$ – $.86$ and 2-week test-retest stability of $r = .80$.

Measures From Daily Diaries

Gratitude-relevant daily events and discrete emotional reactions to them. Participants used daily diaries to report information regarding discrete gratitude-relevant episodes each day. Participants described (typ-

ically with a single phrase) up to eight situations in which they felt grateful each day. Next to the description of each gratitude-eliciting situation, participants listed the specific people to whom they felt grateful in the corresponding situation. Then, they rated the intensity of the gratitude elicited by each situation on a 3-point Likert-type scale (1 = *Somewhat grateful*; 3 = *Extremely grateful*). From these data, we were able to derive three measurements of discrete gratitude-inducing events in participants' daily lives and their emotional reactions to these events: (a) *gratitude frequency* (the number of discrete daily situations that elicited gratitude), (b) *gratitude density* (the number of people to whom participants felt grateful each day), and (c) *mean episodic gratitude intensity* (the mean gratitude intensity rating for all of the discrete situations that elicited gratitude each day).

Gratitude in daily mood. In the next section of each daily diary entry, participants were instructed to rate 38 emotion words including three gratitude-related adjectives (*grateful*, *thankful*, and *appreciative*) to indicate "the extent to which you felt each of these emotions today." As in Study 1, scores on these three adjectives were averaged and used as a measure of gratitude in their daily moods. Across the 14 days of the study, the mean internal consistency reliability of this three-item composite was $\alpha = .90$.

Procedure

Participants received a questionnaire packet and daily diaries at the beginning of class during an undergraduate course in the spring semester of 2001. Participants were instructed to complete the questionnaire packet as soon as possible and to complete one diary entry each night for 14 days. Materials were collected each class session (four times total) during the 2-week period.

Analyses

We conducted multilevel models as in Study 1 (see Equations 1 and 2) to study the personality and affective trait correlates of participants' mean levels of gratitude in daily mood across the 14 days. In addition, we examined the within-subjects correlations of three time-varying covariates (gratitude frequency, gratitude density, and mean episodic gratitude intensity) with the three-item measure of gratitude in daily mood. These within-subjects correlations allowed us to estimate the extent to which people who had more gratitude in their daily moods on a given day than was typical for them also had (a) more discrete events that caused them to feel grateful on that day (gratitude frequency), (b) more people to whom they felt grateful on that day (gratitude density), and (c) more intense emotional responses to those gratitude-eliciting episodes they experienced that day (mean episodic gratitude intensity). These models took the form

$$\text{GMR}_{ij} = \beta_{0j} + \beta_{1j}(\text{day}) + \beta_{2j}(\text{gratitude-inducing events}) + r_{ij} \quad (4)$$

Equation 4 decomposes Person j 's GMR on Day i into a mean level across the 14 days (centered on the first day of the study, β_{0j}); a linear effect for time, $\beta_{1j}(\text{day})$; an effect due to the number of gratitude-inducing events specified in Person j 's daily diary on Day i , $\beta_{2j}(\text{gratitude-inducing events})$; and a residual r_{ij} . In other words, this equation allows one to determine whether Person j experienced more gratitude in daily mood than is personally typical on days when he or she experienced more gratitude-inducing events than is personally typical, controlling for typical level of gratitude in daily mood. We conducted similar within-person models for each of the three above-mentioned time-varying covariates and then examined them jointly as simultaneous within-subjects predictors.

Finally, we tested the conductance and resistance hypotheses by examining cross-level interactions between people's scores on the GQ-6 (a between-subjects covariate, centered on the sample mean) and their daily

scores on the three time-dependent or within-subjects covariates, each of which was centered on each person's mean (Nezlek, 2001). These analyses enabled us to determine whether the associations between the three time-dependent covariates and gratitude in daily mood varied as a function of participants' scores on the GQ-6, which is a measure of gratitude as an affective trait.

Results and Discussion

Means, standard deviations, and reliabilities for major study variables appear in Table 3.

Longitudinal Trajectories of Gratitude in Daily Mood Ratings

First, as in Study 1, we decomposed people's 14 daily ratings of gratitude in daily mood into initial status and linear change components. The mean initial status was above the midpoint on the 1–5 scale (coefficient = 3.75, $SE = 0.07$). In addition, there was a small mean reduction in daily gratitude as the study progressed (coefficient = -0.04 , $SE = 0.01$), $t(111) = -5.91$, $p < .001$. These general trends notwithstanding, there were substantial individual differences among participants in both the initial status (variance = 0.48, $p < .001$) and linear change (variance = 0.002, $p < .001$) parameters. These two parameters accounted for 48% of the variance in the amount of gratitude in people's daily mood reports. We proceeded to look for personality variables that might explain individual differences in these initial status parameters. There was no gender difference for the initial status parameter or linear change parameter ($ps > .30$).

Correlations of Dispositional Measures With Typical Levels of Gratitude in Daily Mood

In a series of Level 2 models, we estimated the correlations of several personality and affective traits with individual differences in the mean amounts of gratitude in participants' daily moods across the 14 days.

Correlations with the measures of gratitude as an affective trait. Table 4 shows that participants' scores on the GQ-6 were correlated with individual differences in mean levels of gratitude in the daily mood ratings (coefficient = 0.57, $SE = 0.10$), $t(110) = 5.90$, $p < .001$ ($r = .49$), as was the three-item adjective measure of gratitude as an affective trait (coefficient = 0.57, $SE = 0.10$), $t(110) = 5.59$, $p < .001$ ($r = .47$). These results are very similar to those obtained in Study 1.

Life satisfaction and affectivity. Consistent with the results from Study 1, people with high levels of life satisfaction, happiness, and PA had higher mean levels of gratitude in their daily moods. Also, as in Study 1, NA was not related to mean levels of gratitude in daily mood (see Table 4).

Religious and spiritual variables. Similar to Study 1, people who reported high levels of spirituality had higher mean levels of gratitude in their daily moods, as did people higher in religious interest, general religiousness, and intrinsic religious orientation. However, extrinsic religious orientation and quest religious orientation were not significantly correlated with mean levels of gratitude in participants' daily moods. These findings suggest that people who are involved in conventional forms of religiousness, especially people for whom religion is a fundamental organizing

Table 3
Means, Standard Deviations, and Reliability Estimates for Major Variables, Study 2

Variable	Range	<i>M</i>	<i>SD</i>	Reliability
Daily measures (initial status parameters only)				
Gratitude in Daily Mood	1–5	3.75	0.69	.76 ^a
Gratitude frequency	0–8	2.27	1.47	.88 ^a
Gratitude density	1+	3.03	2.16	.83 ^a
Mean episodic gratitude intensity	1–3	2.10	0.58	.48 ^a
Gratitude as an affective trait				
GQ-6	1–7	6.31	0.65	.76
Gratitude Adjectives Scale	1–5	4.28	0.71	.89
Satisfaction With Life Scale	1–7	5.32	1.11	.84
Empathic Concern	1–5	3.98	0.53	.76
Perspective-Taking	1–5	3.60	0.53	.74
Religious interest	1–9	6.27	2.29	—
General religiousness ^b	8–34	24.90	22.18	.88
Intrinsic Religious Orientation ^b	1–9	5.88	1.59	.89
Extrinsic Religious Orientation ^b	1–9	4.30	0.97	.69
Quest Religious Orientation ^b	1–9	4.78	1.31	.83
Self-Transcendence	1–4	2.31	0.64	.90
Positive Affectivity	1–5	3.84	0.55	.83
Negative Affectivity	1–5	2.00	0.63	.86
Envy	1–5	1.84	1.72	.86
Big Five				
Openness	1–5	3.70	0.57	.76
Conscientiousness	1–5	3.63	0.72	.84
Extraversion	1–5	3.60	0.76	.85
Agreeableness	1–5	3.91	0.63	.81
Neuroticism	1–5	2.90	0.81	.85

Note. GQ-6 = Gratitude Questionnaire, six-item form.

^aReliability calculated as percentage of true parameter variance per Bryk and Raudenbush (1992). All other reliabilities estimated with Cronbach's alpha. ^b*n* = 87. All other *ns* = 112.

principle (i.e., people who are intrinsically religious) and people who report high levels of spiritual transcendence experience more gratitude in their daily moods than do their less religious or spiritual counterparts.

Prosocial traits. The Empathic Concern subscale (but not the Perspective-Taking subscale) from Davis's Interpersonal Reactivity Index was strongly associated with mean levels of gratitude in people's daily moods. Dispositional envy was not related to mean levels of gratitude in daily mood.

The Big Five. Among the Big Five, Agreeableness and Openness were positively and significantly correlated with mean levels of gratitude in people's daily moods. These results differ substantially from those of Study 1, in which Extraversion was the major Big Five predictor of mean levels of gratitude in people's daily moods.

Associations of Gratitude as an Affective Trait With Gratitude in Daily Mood, Controlling for Higher Order Personality and Affective Traits

As in Study 1, we estimated the associations of our two measures of gratitude as an affective trait with mean levels of gratitude in daily mood, controlling for their associations with the Big Five and trait PA and NA. When these additional seven variables were included with the GQ-6, the association of the GQ-6 with mean levels of gratitude in daily mood remained statistically significant (coefficient = .33, *SE* = .11), $t(103) = 2.97$, $p = .003$ (effect size $r = .27$). Similarly, the association of the three-item adjective

measure of gratitude as an affective trait with participants' mean levels of gratitude in daily mood remained statistically significant (coefficient = .38, *SE* = .11), $t(103) = 3.53$, $p = .001$ (effect size $r = .32$). Thus, the association of gratitude as an affective trait with mean levels of gratitude in daily mood could not be explained solely in terms of the Big Five, trait PA, and trait NA.

Predicting the Day-to-Day Fluctuations of Gratitude in Daily Mood With Gratitude-Relevant Daily Events and Discrete Emotional Reactions to Them

We proceeded to examine the extent to which the day-to-day fluctuations of gratitude in people's daily moods varied as a function of scores reflecting day-to-day changes in gratitude frequency, gratitude density, and mean episodic gratitude intensity. We examined these associations by individually adding each of these three time-dependent covariates into the Level 1 model in which gratitude in people's daily moods was already decomposed into terms representing initial status, linear change, and residual variance (as in Equation 4). The resulting associations between day-to-day fluctuations of gratitude in daily mood and the three time-dependent covariates are partial associations, with the effects for initial status and linear change controlled simultaneously.

As can be seen in Table 5, all three time-dependent covariates were strongly correlated with day-to-day fluctuations in participants' gratitude mood reports (effect size *rs* ranging from .61–.70, $ps < .001$). Thus, people experienced more gratitude in their daily moods on days when (a) they experienced many gratitude-eliciting

Table 4
Correlations of Personality and Affective Traits With Initial Status Parameters for Gratitude in Daily Mood, Study 2

Personality measure	Coefficient	SE	<i>t</i> (110)	Effect size <i>r</i>
Affective trait measures of gratitude				
GQ-6	0.57	0.10	5.90***	.49
Three-item adjective measure	0.57	0.10	5.59***	.47
Life satisfaction and affectivity				
Life Satisfaction	0.23	0.07	3.28**	.30
Happiness	0.27	0.08	3.29**	.30
Positive Affectivity	0.57	0.13	4.27***	.38
Negative Affectivity	-0.04	0.11	-0.34	-.03
Religious/spiritual variables				
Religious Interest	0.09	0.03	2.79**	.26
General Religiousness	0.05	0.01	4.09***	.36
Intrinsic Religious Orientation	0.13	0.04	3.25**	.30
Extrinsic Religious Orientation	-0.06	0.10	-0.55	-.05
Quest Religious Orientation	-0.08	0.07	-1.13	-.11
Self-Transcendence	0.49	0.12	3.95***	.35
Prosocial traits				
Empathic Concern	0.84	0.09	8.90***	.65
Perspective-Taking	0.30	0.15	1.95	.18
Envy	-0.07	0.09	-0.77	-.07
The Big Five				
Openness	0.27	0.13	2.02*	.19
Conscientiousness	-0.02	0.11	-0.20	-.02
Extraversion	0.16	0.09	1.74	.16
Agreeableness	0.53	0.13	4.20***	.37
Neuroticism	0.01	0.09	0.12	.01

Note. GQ-6 = Gratitude Questionnaire, six-item form.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

events (high gratitude frequency), (b) many people did things that caused them to feel grateful (high gratitude density), and (c) they experienced a high mean degree of grateful emotion per gratitude-eliciting event (high mean episodic gratitude intensity). When we entered all three time-dependent covariates simultaneously to pre-

dict day-to-day fluctuations in participants' gratitude mood reports, both gratitude frequency and mean episodic gratitude intensity maintained significant unique associations (effect size $r_s = .39$ and $.65$, respectively, $p_s < .001$), although the number of people who caused participants to feel grateful did not (effect size $r = .05$,

Table 5
Relationship Between Gratitude in Daily Mood and Gratitude Density, Gratitude Frequency, and Mean Episodic Gratitude Intensity, Study 2

Gratitude measure	Coefficient	SE	<i>t</i> (110)	Effect size <i>r</i>
Individual entry of time-dependent covariates				
Gratitude density	0.09	0.01	8.17***	.61
Gratitude frequency	0.20	0.02	9.14***	.66
Mean episodic gratitude intensity	0.33	0.03	10.16***	.70
Simultaneous entry of time-dependent covariates				
Gratitude density	0.01	0.01	0.52	.05
Gratitude frequency	0.11	0.03	4.49***	.39
Mean episodic gratitude intensity	0.29	0.03	9.05***	.65

*** $p < .001$.

ns). Thus, the amount of gratitude that people reported in their daily mood on any given day was uniquely related to the number of discrete events that caused them to feel grateful that day and how grateful they felt, on average, in response to the gratitude-eliciting events experienced that day.

Interactions of the Grateful Disposition With Gratitude-Relevant Daily Events and Discrete Emotional Reactions to Them: Testing the Conductance and Resistance Hypotheses

The conductance hypothesis states that for people with a strong disposition toward gratitude, the gratitude-relevant events they encounter in daily life and their episodic emotional reactions to them are strongly predictive of the amount of gratitude in their daily moods. Conversely, for people with a weak disposition toward gratitude, the gratitude-relevant events they encounter in daily life and their episodic emotional reactions to them are less strongly predictive of gratitude in daily mood. The resistance hypothesis yields the opposite predictions.

We evaluated these hypotheses by examining the interaction terms resulting from the entry of people's scores on the GQ-6 as a between-subjects predictor of the associations of each of the time-varying covariates and day-to-day fluctuations in grateful mood. In other words, we examined whether the magnitudes of the within-subjects associations were moderated by gratitude as an affective trait. Scores on the GQ-6 were negatively related to the strength of the associations of gratitude in daily mood with gratitude frequency (coefficient = $-.10$, $SE = 0.03$), $t(110) = -2.86$, $p = .005$, gratitude density (coefficient = -0.04 , $SE = 0.01$), $t(110) = -2.94$, $p = .004$, and marginally so with mean episodic gratitude intensity (coefficient = -0.08 , $SE = .05$), $t(110) = -1.76$, $p = .08$. In other words, gratitude as an affective trait appeared to moderate the associations of gratitude-relevant social events (and people's emotional reactions to these events) and the amount of gratitude that participants experienced in their daily mood.

To interpret these interactions, we compared people who scored half a standard deviation or more above the mean on the GQ-6 (6.63 or higher; $n = 39$) with people who scored half a standard deviation or more below the mean (5.97 or lower; $n = 25$). For people scoring high on the GQ-6, correlations between day-to-day fluctuations of gratitude in daily mood and gratitude frequency ($r = .21$, $p > .16$), as well as gratitude density ($r = .22$, $p > .17$) were relatively small and nonsignificant. Only the correlation between day-to-day fluctuations of gratitude in daily mood and mean episodic gratitude intensity was significant ($r = .61$, $p < .001$). In contrast, for people scoring low on the GQ-6, day-to-day fluctuations of gratitude in daily mood were correlated with gratitude frequency ($r = .72$, $p < .001$), with gratitude density ($r = .58$, $p = .006$), and with mean episodic gratitude intensity ($r = .59$, $p = .002$). In support of the resistance hypothesis, the association of day-to-day fluctuations in the amount of gratitude in people's mood reports with day-to-day fluctuations in the number of events for which they felt grateful each day and the number of people to whom they felt grateful was relatively weak for people who had relatively strong dispositions toward gratitude.¹

Additional Construct Validity Data on Measures of Gratitude as an Affective Trait

Finally, we examined the associations of the GQ-6 and the three-item adjective measure of gratitude as an affective trait with the daily diary measures of gratitude frequency, gratitude density, and mean episodic gratitude intensity, which we decomposed into initial status and linear change components via HLM 5. As can be seen in Table 6, both measures of gratitude as an affective trait were correlated with all of these daily measures (initial status values) in the theoretically expected directions (effect size r s ranged from .14 to .25). The GQ-6 was significantly correlated with participants' typical daily scores on mean episodic gratitude intensity and gratitude density (the mean number of people to whom they felt grateful each day). The three-item adjective measure of gratitude as an affective trait was significantly correlated only with gratitude density. Neither the GQ-6 nor the three-item adjective measure of gratitude as an affective trait was correlated with linear change in these three time-varying measures.

Summary

Study 2 replicated many findings from Study 1 regarding the personality and affective traits that predict mean levels of gratitude in daily mood. In addition, we found that people high in empathic concern experience more gratitude in their daily moods than do their less empathic counterparts. Unlike Study 1, however, in which Extraversion appeared as the most important Big Five predictor of mean levels of gratitude in daily mood, we found in Study 2 that Agreeableness was the strongest Big Five correlate of mean levels of gratitude in daily mood.²

Study 2 also yielded evidence that gratitude in people's daily moods was strongly related to the number of discrete interpersonal events in their daily lives that elicited gratitude (gratitude frequency) as well as the mean degree of gratitude they experienced in response to those discrete events (mean episodic gratitude intensity). The correlations of these daily measures were strongest for people with relatively weak dispositions toward gratitude.

¹ To ensure that these differences in the correlations for people high versus low in gratitude as an affective trait were not the artifactual result of range restrictions in the relevant measures, we examined their standard deviations for participants who were half a standard deviation above versus below the mean on the GQ-6. For these two groups of participants, the standard deviations for the four variables were as follows: gratitude in daily mood: 0.74 versus 0.64; gratitude density: 2.66 versus 1.37; gratitude frequency: 1.53 versus 1.20; mean episodic gratitude intensity: 0.49 versus 0.50. Because the standard deviations for people scoring high on the GQ-6 were no smaller than they were for people scoring low on the GQ-6, the results could not be explained as an artifact of range restriction. We also obtained the same pattern of results when we divided the sample on the basis of scores on the three-item adjective-based measure of gratitude as an affective trait rather than the GQ-6.

² A significance test for the difference between two independent correlations revealed that the correlation of Extraversion with gratitude in daily mood was significantly stronger in Study 1 than in Study 2 (r s = .38 and .16, N s = 96 and 112, respectively; $p < .05$). The correlation of Agreeableness with gratitude in daily mood was marginally significantly stronger in Study 2 than in Study 1 (r s = .37 and .16, N s = 112 and 96, respectively; $p = .06$).

Table 6
Correlations of Affective Trait Measures of Gratitude With Daily Diary Measures (Initial Status Parameters Only), Study 2

Daily diary measure	Coefficient	SE	<i>t</i> (110)	Effect size <i>r</i>
Gratitude Questionnaire, six-item form				
Mean episodic gratitude intensity	0.24	0.09	2.71**	.25
Gratitude density	0.71	0.32	2.24*	.21
Gratitude frequency	0.29	0.19	1.53	.14
Three-item gratitude adjective scale				
Mean episodic gratitude intensity	0.17	0.09	1.92	.18
Gratitude density	0.60	0.29	2.09*	.20
Gratitude frequency	0.32	0.18	1.77	.17

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

Finally, Study 2 yielded further evidence that measures of gratitude as an affective trait are useful for predicting several dimensions of gratitude in people's daily interpersonal and emotional experience.

General Discussion

The present studies represent the first attempt of which we are aware to examine the relationships among gratitude as a mood, gratitude as an affective trait, and gratitude as a discrete emotional response to gratitude-relevant interpersonal events. Specifically, these results make four major contributions to a scientific understanding of gratitude. First, they help to identify the personality and affective traits that are associated with the stable interindividual differences in the typical degree of gratitude that people experience in their daily moods. Second, they help to identify key aspects of people's day-to-day social lives (and their emotional reactions to them) that explain why people experience more gratitude in their moods on some days than on others. Third, they suggest that gratitude as an affective trait may actually weaken the link between gratitude-relevant interpersonal events (and people's fleeting emotional reactions to those events) and the degree of gratitude in people's daily moods. Finally, on a methodological note, whereas nearly all previous research on experiences of gratitude has made use of hypothetical gratitude scenarios (e.g., Graham, 1988; Tesser, Gatewood, & Driver, 1968) or retrospective accounts of gratitude (Gray et al., 2001), the present set of studies examined grateful affect as it unfolded in daily life and how it was associated with personality and affective traits as well as events in people's interpersonal worlds.

The present findings are novel in part because they illuminate how gratitude operates in people's daily moods—the intermediate terrain between affective traits and discrete emotion episodes (Rosenberg, 1998)—which has been neglected in gratitude research to date. Grateful moods are an important level of affect at which to understand gratitude because moods generally have greater distributive breadth and pervasiveness in consciousness than do emotions; as a result, grateful moods probably have broader effects on other psychological systems (e.g., cognition, person perception, physiology, coping with stress) than do grateful

emotions (which have a more focused, action-oriented, short-lived influence). In the present study, we conceptualized mood in terms of two components (a) a component representing people's average levels of gratitude in their moods over a 2-week or 3-week period and (b) day-to-day fluctuations of people's grateful moods around their mean levels.

Affective Traits as Predictors of Mean Levels of Gratitude in Daily Mood

Adults with neuromuscular disorders and university students who tend to experience high mean levels of gratitude in daily mood appear to be satisfied with their lives, happy, optimistic, and prone to positive emotionality. Results from both studies were consistent on this point. In contrast, measures of negative affective traits (e.g., NA, depression, and envy) were correlated negatively but at rather low magnitudes (e.g., less than $r = 1.25$) with mean levels of gratitude in participants' daily mood reports. These findings corroborate those of McCullough et al. (2002), who found that measures of gratitude as an affective trait were more closely linked to positive affective traits than to negative ones. Thus, gratitude both as an affective trait and as a mood appears to be characteristic of happy, contented, optimistic people (see also Watkins, 2004).

Spiritual and Religious Predictors of Mean Levels of Gratitude in Daily Mood

McCullough et al. (2002) reported that measures of gratitude as an affective trait were consistently associated with higher scores on measures of religious involvement and spirituality. Consistent with those findings, the present results demonstrate that people who score high on traditional measures of religious commitment, intrinsic (but not extrinsic or quest) religious motivation, and more nontraditional measures of spirituality experience more gratitude in their typical daily moods than do less religious and spiritual people. Again, Studies 1 and 2 were remarkably consistent in this regard. As far as we are aware, the present studies yield the first evidence that gratitude may be a positive mood characteristic of religiously and spiritually engaged people, just as an absence of depressive symptoms is a negative mood characteristic of spiritually and religiously engaged people (T. B. Smith, McCullough, & Poll, 2003).

The Big Five as Predictors of Mean Levels of Gratitude in Daily Mood

Studies 1 and 2 provided different pictures of the Big Five correlates of mean levels of gratitude in participants' daily moods. In Study 1, in which we studied adults with neuromuscular disorders, mean levels of gratitude in daily mood were related most strongly to Extraversion. In Study 2, in which we studied basically healthy university students, mean levels of gratitude in daily mood were related most strongly to Agreeableness. In three previous studies, McCullough et al. (2002) found that Agreeableness was correlated with gratitude as an affective trait in three samples of basically healthy university students and adults. However, Extraversion was also uniquely associated with gratitude as an affective trait (and Neuroticism negatively so) in several tests. One expla-

nation for these results is that Extraversion and Agreeableness play different roles in facilitating grateful moods depending on whether one's health status limits exposure to potential benefactors.

Basically healthy university students are likely, on average, to have relatively high access to socially supportive relationships (friends, roommates, classmates, other members of organizations to which they belong). Moreover, in their in loco parentis capacity, universities encourage students to avail themselves of a wide variety of academic, social, and health services (which are, among other things, structured forms of social support) to address nearly every possible problem in living. Thus, for university students, the key to experiencing grateful moods in daily life may not be simply exposing oneself to benevolent people. Rather, grateful moods may be a matter of appreciating the wide range of beneficial relationship partners with whom one might interact in a given week. Agreeableness is the Big Five dimension most closely linked with perceiving others in a charitable and benevolent fashion and may therefore be the trait that determines the degree of gratitude experienced by people who live in social worlds that teem with potential benefactors. To be in a grateful mood, perhaps university students merely need to recognize the benevolent nature of the social worlds they typically inhabit.

In contrast, for people with chronic illness, whose mobility and social interaction may be limited to some extent by physical symptoms, experiencing grateful moods may be more contingent on actually interacting with an adequate number of supportive relationship partners. Extraversion is the Big Five dimension with the most relevance for seeking out and enjoying social interaction (Ashton, Lee, & Pausonon, 2002), so perhaps the more extroverted among adults with chronic physical illnesses are more likely to encounter benevolent interaction partners. For people with chronic illnesses that can limit functional abilities, feeling grateful in daily life may be largely a matter of ensuring that one interacts with other people who can provide one with such benefits.

In any case, the contribution of the Big Five to predicting mean levels of gratitude in daily mood was modest (i.e., they accounted for approximately 18%–26% of the variance in the amount of gratitude in people's daily moods). In this respect, the present results mirror the relationship between gratitude as an affective trait and the Big Five found by McCullough et al. (2002), who reported that the Big Five accounted for 21%–33% of the variance in self-ratings of the disposition toward gratitude. Therefore, we can conclude confidently that the Big Five (in some still unclear combination that might vary depending on one's life situation) account for some of the variance in mean levels of gratitude in daily mood, though only a fraction of it.

Daily Gratitude-Relevant Events as Predictors of Day-to-Day Fluctuations in Grateful Mood

Day-to-day fluctuations in grateful mood are strongly related to the day-to-day fluctuations in gratitude-relevant aspects of people's daily lives. Participants reported the most gratitude in their daily moods on days (a) when they reported many situations that caused them to feel grateful, (b) when they listed many people to whom they felt grateful, and (c) when they felt high levels of grateful emotion per daily episode. In other words, discrete experiences of grateful emotions—along with the interpersonal events and appraisals that ostensibly occasion them—appeared to foster

high levels of gratitude in daily mood. Although no one knows for sure where the boundary between an emotion and a mood really lies, it seems plausible from these data that discrete episodes of grateful emotions diffuse into daily mood, thereby casting a grateful affective tone over people's daily mood experiences.

How Gratitude as an Affective Trait Interacts With Daily Experience

In her theoretical analysis of the relationships between affective traits, moods, and emotions, Rosenberg (1998) focused primarily on the bivariate causal associations among these three levels of affect. In the present article we have explored how two of these levels of affect, namely, affective traits and emotions, might operate interactively to influence gratitude in daily mood. We found that the disposition toward gratitude can be conceptualized as a trait that establishes consistently high amounts of gratitude in people's daily moods irrespective of day-to-day fluctuations in gratitude-relevant interpersonal events and people's emotional reactions to them. Because dispositionally grateful people's proneness to grateful moods is driven so strongly by personality, their grateful moods may be less dependent on the ebb and flow of gratitude-relevant life events (the number of events for which they are grateful each day), the number of people to whom they feel grateful each day, and (marginally) the amount of gratitude they experience in the typical gratitude-eliciting situation. These findings are supportive of the resistance hypothesis of the grateful disposition.

This finding seems counter to much existing work. For example, some work (e.g., Gross et al., 1998; Gunthert, Cohen, & Armeli, 1999; Larsen & Ketelaar, 1991) has suggested that affective traits such as Neuroticism–NA and Extraversion–PA moderate the link between emotionally valenced life events and emotional reactions, that is, that people with a personality-based proneness to positive emotions (e.g., people high in Extraversion) experience more positive emotional reactions to pleasant events, and people with a personality-based proneness to negative emotions (e.g., people high in Neuroticism) experience more negative emotional reactions to unpleasant events.

However, not all of the existing research supports the conductance hypothesis. David, Green, Martin, and Suls (1997) found no evidence that Neuroticism and Extraversion moderated the links between desirable or undesirable life events and daily mood. Also, consistent with the resistance hypothesis and the present findings, Affleck et al. (1992) reported that among patients with rheumatoid arthritis, Neuroticism appeared to weaken the association between daily pain ratings and negative affect in daily mood. One feature that seems to differentiate the present study from many of the others in this area is that rather than examining the conductance and resistance hypotheses vis-à-vis global affective traits (e.g., Extraversion–PA and Neuroticism–NA), we looked at a discrete affective trait (i.e., the grateful disposition) that predisposes people to experience a particular discrete affect in daily mood (i.e., gratitude). Perhaps other investigators using similar methods will find that discrete affective traits—for example, hostility—predispose people to experience (a) higher levels of discrete affects (e.g., anger) in daily mood and (b) emotion-inducing (i.e., anger-inducing) events more frequently but not a stronger link between

the number of anger-inducing events experienced and the amount of anger experienced in daily mood.

Summary

The results presented herein stand alongside recent work that has helped to clarify the nature of gratitude as a discrete emotional experience (McCullough et al., 2001) and an affective trait (McCullough et al., 2002). On the basis of these findings, we conclude that grateful moods are created both through top-down effects (i.e., the effects of personality and affective traits), bottom-up effects (i.e., the effects of discrete interpersonal and emotional episodes), and the interaction of these effects. More broadly, we have attempted to articulate a view of how the three levels of affect— affective traits, moods, and emotions—relate to one another using the affect of gratitude as a case in point. As such, the present results may be useful not only for better understanding gratitude specifically but as a useful model for articulating how these three levels of affect relate to one another for other discrete affects as well.

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