Personality differences in the occurrence and affective correlates of daily positive events

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Abstract

Objective: Previous research shows that Neuroticism predicts exposure and affective reactivity to daily stressors (Bolger and Zuckerman, 1995). Zautra and colleagues (2005) extended this work to daily positive events. Building on these frameworks, we examined the Big Five personality traits as predictors of the occurrence and affective correlates of daily positive events.

Method: Participants in two national U.S. daily diary studies (NSDE 2: N = 1919 and NSDE Refresher: N = 778; aged 25–84) reported daily positive events, emotions specific to the events, and daily affect for 8 consecutive days.

Results: In parallel analyses in both samples, Extraversion and in the NSDE Refresher sample only Openness (but not Neuroticism, Conscientiousness, or Agreeableness) predicted more frequent positive event occurrence. All Big Five traits were associated with one or more emotional experiences (e.g., *calm, proud*) during positive events. Neuroticism predicted greater event-related positive affect in the NSDE 2 sample, whereas Agreeableness was related to more event-related negative affect in the NSDE Refresher sample.

Conclusions: The Big Five personality traits each provided unique information for predicting positive events in daily life. The discussion centers on potential explanations and implications for advancing the understanding of individual differences that contribute to engagement in positive experiences.

The ups and downs of daily life can accumulate over time to influence long-term health and well-being. Yet, people differ from one another in their affective responses to these daily life experiences. Individual differences in stressor-related affect—as indicated by differences

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in affect on days with versus without stressors—are prospectively associated with risks for developing affective disorders, chronic health conditions, and premature mortality (Charles et al., 2013; Mroczek et al., 2015; Piazza et al., 2013). These within-person associations between events and affect are intertwined with personality traits (Bolger & Zuckerman, 1995; Leger et al., 2016; Suls & Martin, 2005; Zautra et al., 2005). Research on the associations of personality with affect and events in daily life has predominantly focused on Neuroticism and stress processes. In particular, Neuroticism is consistently linked to greater exposure to daily stressors (i.e., more frequent stressors) and higher stressor-related negative affect (Bolger & Zuckerman, 1995; Leger et al., 2016; Suls & Martin, 2005). Positive aspects of daily life have received considerably less attention than stressors, despite their frequent occurrence (Sin & Almeida, 2018). Building on previous research on the role of personality in everyday processes of adaptation (Bolger & Zuckerman, 1995; Leger et al., 2016; Zautra et al., 2005), the current study investigated the Big Five personality traits as predictors of the occurrence of positive events, event-related daily affect, and specific emotions during daily positive events.

Conceptual Frameworks: Bolger and Zuckerman (1995) & Zautra and colleagues (2005)

Stress is a potential pathway through which personality traits may contribute to health and well-being (Friedman & Kern, 2014). To guide research on the role of personality in the stress process, Bolger and Zuckerman (1995) proposed a *Person x Situation* framework that posits, first, that personality may influence the extent to which a person is likely to experience stressors (i.e., *exposure*), and second, that personality may moderate the associations between stressors and well-being outcomes (i.e., *reactivity*). In support of their model, their results indicated that higher Neuroticism was associated with relatively more daily conflicts, a greater tendency to react to conflicts with anger and depression, and differences in coping choices and coping effectiveness. Although Bolger and Zuckerman (1995) focused specifically on Neuroticism, they noted that their framework could be applied to other personality traits. This was recently done by Leger and colleagues (2016) using the same dataset employed in the current study. They found that higher levels of Extraversion, Openness, and Conscientiousness buffered against increases in negative affect on days when stressors occurred, and that Agreeableness was related to greater stressor-related decreases in positive affect (Leger et al., 2016).

Zautra and colleagues (2005) argued that an exclusive focus on stress processes provides an incomplete portrayal of life experiences and that "progress is likely to advance most rapidly when Bolger and Zuckerman's (1995) model is reloaded with measures of the positive in events, affect, and personality" (p. 1535). Daily positive events (also called *uplifts*) are relatively minor events in everyday life that are considered favorable or desirable, based on either the respondent's or the researcher's judgment. These events are situated within the environmental context and reflect transactions between the person and their environment (Sin et al., 2015; Zautra et al., 1986, 2005). Daily positive events (e.g., taking a leisurely walk or hearing good news from a friend) are conceptually distinct from one's internal states, yet they undoubtedly influence and are influenced by one's emotions (e.g., calm,

happy), cognitions (e.g., anticipation of a positive event), and physical states (e.g., fatigue, cortisol; Parrish et al., 2008; Sin, Ong, et al., 2017). Positive events are common in daily life —for example, occurring on 72–75% of days in daily diary studies (Sin & Almeida, 2018)— and usually result in increased positive affect on days when these events occur (Zautra et al., 2005). People who report more frequent daily positive events tend to show favorable health outcomes, such as lower levels of inflammation (Bajaj et al., 2016; Sin et al., 2015), steeper diurnal cortisol profiles (Sin, Ong, et al., 2017), and better sleep (Sin, Almeida, et al., 2017). Importantly, these associations of daily positive events with better health are independent of indices of psychological distress. These events provide unique information about emotional processes and daily life that are not captured by stressors (Zautra et al., 2005).

Because positive events differ in important ways from stressors, Zautra and colleagues suggested key modifications to the framework. Unlike stressors, people typically take active roles in seeking out and creating positive events (Reich & Zautra, 1981, 1984). Thus, the term *engagement* better reflects volition and active engagement in positive events, compared to the term *exposure* which implies that stressors happen without the person intentionally producing those stressors (Zautra et al., 2005). Furthermore, the concept of *reactivity* implies that an individual is provoked by an external stressor, whereas the term *responsiveness* is more appropriate for describing emotional responses to positive events because it captures one's active involvement in acquiring emotional benefits from these events (Zautra et al., 2005). In the current study, event-related affect (i.e., differences in affect on days when positive events occur vs. on days when no positive events occur) is used as a proxy to examine responsiveness (Leger et al., 2016).

Engagement in and affective responsiveness to positive events

Insights on the link between Extraversion and positive event processes come from different sources including daily life assessments, survey data and lab-based work. With regards to engagement in positive events, survey and daily diary data has shown that people higher in Extraversion experience daily positive events more frequently. This link has been consistently found in various samples, including patients with rheumatoid arthritis (Zautra et al., 2005), police officers (Hart & Wearing, 1995), and a community sample of men (David et al., 1997).

With regards to responsiveness to positive events, lab-based studies have shown that people higher in Extraversion exhibit greater sensitivity to rewarding positive stimuli (Gomez et al., 2000; Gross et al., 1998; Larsen & Ketelaar, 1991; Smillie et al., 2019). Yet, these lab-based findings with controlled stimuli may not extend to naturally-occurring experiences in daily life. Studies employing daily diaries or experience sampling have found that although people higher in Extraversion engage more frequently in social interactions, they do not respond more positively to these social interactions (Diener et al., 1984; Lucas et al., 2008; Srivastava et al., 2008; Zautra et al., 2005). For example, Zautra and colleagues (2005) found that people higher in Extraversion had less of an increase in relationship enjoyment on days when more positive social events occurred than usual, compared to people lower in Extraversion. Thus, past research has connected Extraversion with both greater responsiveness in lab contexts, but also reduced event-related relationship enjoyment

in daily life. Given these mixed and somewhat contradictory findings, the current research has the potential to clarify the link between Extraversion and positive event-related affect.

Extraversion, Conscientiousness, and Openness have each been conceptualized as a tendency to engage in different kinds of endeavors (Ashton & Lee, 2007), and they load onto higher-order factor called *engagement* or *proactivity* (de Vries et al., 2016). Extraversion represents a tendency to engage in social endeavors, Openness a tendency to engage in idea-related endeavors, and Conscientiousness a tendency to engage in task-related endeavors (Ashton & Lee, 2007). These tendencies of actively investing resources into domains of interest may translate to experiencing more positive events. For example, an experience sampling study found that both Conscientiousness and Openness predicted more time spent on creative pursuits (Silvia et al., 2015). Given that these three traits are subsumed under the higher-order factor engagement/proactivity, we expected them to be related to greater engagement in positive events. Pertaining to emotions associated with positive events, it remains an open question for investigation whether and how these traits are linked to people's feelings associated with positive events.

Agreeableness emphasizes cooperation, empathy, and compassion (John & Srivastava, 1999) and is predictive of higher positive affect and better social relationships (DeNeve & Cooper, 1998; Schmutte & Ryff, 1997). The favorable associations of Agreeableness with well-being might be explained by people higher in Agreeableness having more satisfying relationships compared to those lower in Agreeableness (Malouff et al., 2010; Tov et al., 2016). We would therefore expect that people higher in Agreeableness will be more likely to feel close to others when having positive social interactions. To our knowledge, there is no existing research that examines Agreeableness, Conscientiousness, or Openness as predictors of daily positive events.

Lastly, Neuroticism is strongly related to greater negative affect and greater exposure and reactivity to daily stressors (Bolger & Zuckerman, 1995; Costa & McCrae, 1980; Rusting & Larsen, 1997; Suls & Martin, 2005). Although research on positive events and Neuroticism is limited, the existing research has produced conflicting results, such that Neuroticism and related constructs have predicted positive, negative, or no associations with positive event-related affect. For example, one previous study found that people higher in Neuroticism had relatively weaker positive affective responses to positive stimuli in a lab setting (Berenbaum & Williams, 1995). A more pronounced behavior inhibition system—a construct closely aligned with Neuroticism (Heubeck et al., 1998)—is associated with greater stressor-related negative affect but not to positive event-related affect (Gable et al., 2000). Related to Neuroticism, people with depressive disorders can show a "mood-brightening effect" such that their positive affect increases to a greater extent in response to positive events, compared to people without depression (Bylsma et al., 2011; Heininga et al., 2017; Peeters et al., 2003). Given these mixed findings, this paper can contribute to the literature by illuminating whether high Neuroticism is linked to fewer daily positive events and how Neuroticism relates to affective experiences associated with positive events.

The current study

Building on Zautra and colleagues (2005), the objective of the current study was to apply their framework to understand the role of Big Five personality traits in naturally-occurring positive events. Using daily diary data from adults across two large national U.S. samples, we pursued three aims. First, we examined associations between the Big Five personality traits and engagement in (i.e., occurrence of) daily positive events. We hypothesized that people higher in Extraversion, Conscientiousness, and Openness would report more days with positive events. By contrast, we did not expect Neuroticism and Agreeableness to be related to positive event engagement, as these traits are not characterized by an agentic component.

Second, we examined associations between the Big Five personality traits and event-related affect, as indicated by overall positive and negative affect reported at the end of the day. Past research has shown that people higher in positive personality traits are less perturbed by both negative and positive events (Charles et al., 2013; Grosse Rueschkamp et al., 2020; Gunaydin et al., 2016; Hill et al., 2020). Zautra and colleagues' (2005) study linking higher Extraversion to smaller increases in event-related relationship enjoyment showed similar results. Based on these studies, we examined whether people with higher Extraversion would show smaller increases in positive affect on days when a positive event occurred (i.e., less positive event-related affect), compared to people lower in Extraversion. We had no a priori hypotheses regarding the role of the other Big Five factors in predicting event-related affect.

Our final aim focused on distinct affective states experienced during the positive events. Emotional experiences during positive events (e.g., *feeling pleasant, calm, proud, surprised, and close to others*) might have subsequent consequences for health and well-being, and are thus worth examining in addition to end-of-day measures of affect. Because this research question is novel and exploratory, we did not have specific predictions for each of the Big Five traits.

Method

Participants and design

The Midlife in the United States Study (MIDUS) is a national U.S. study designed to examine the contributions of psychological and social factors to health across adulthood (Brim, Ryff, & Kessler, 2004). Data was used from two separate samples—specifically, the second wave of MIDUS (MIDUS 2; Ryff et al., 2017) and the MIDUS Refresher Study sample (Ryff, Almeida, Ayanian, Binkley, et al., 2017)—because these were the only MIDUS samples that included assessment of daily positive events. MIDUS 2 consisted of 5,555 participants aged 35–85 years old, and the Refresher Sample consisted of 3,577 adults aged 25–75 years old. After being recruited for the main MIDUS study, participants completed a self-administered questionnaire that included questions about demographics and personality.

A random subset of MIDUS participants was subsequently recruited for a daily diary substudy called the National Study of Daily Experiences (NSDE). NSDE 2 (Ryff & Almeida, 2017) consisted of 2,022 participants for Wave 2 (data collected between 2004 and 2009) and 782 participants for NSDE Refresher (Ryff & Almeida, 2020; data collected between 2012 and 2014). NSDE consisted of brief semi-structured telephone interviews for 8 consecutive evenings (Almeida et al., 2002). Across both samples, participants completed an average of 7.81 of 8 possible daily interviews, and the daily diary data were collected an average of 1.63 years after the personality assessment in the baseline questionnaire. One hundred three participants were excluded for missing values on key variables in the NSDE 2 sample, and 4 in the Refresher sample resulting in analytic sample sizes of $N = 1919$ and $N = 778$ respectively. In addition, 18 participants in the Refresher sample did not report any positive event during the entire study period and thus were excluded from the analyses on subjective experiences felt during positive events. The study procedures were approved by research ethics boards at all study sites, and all participants provided informed consent.

Measures

Big Five Personality Factors.—The Midlife Development Inventory Personality Scale was used to assess the Big Five personality factors (Lachman & Weaver, 1997). Three items were used to assess each factor: Extraversion (*outgoing, friendly, lively*), Agreeableness (*helpful, warm, caring*), Conscientiousness (*organized, responsible, hardworking*), Neuroticism (*moody, worrying, nervous*), and Openness to Experience (*creative, intelligent, imaginative*). Participants were asked to rate how well each of these adjectives described them, using a scale from 1 (*a lot*) to 4 (*not at all*). Items were reverse-scored and averaged, such that higher values indicated a higher manifestation of a given personality trait. Internal consistencies based on McDonald's ω (Hayes & Coutts, 2020) were satisfactory (see Table 1).

Daily positive events.—During telephone interviews for eight consecutive evenings, participants were asked whether each of these types of positive events had occurred that day: (1) *positive social interaction (e.g., sharing a laugh, having a good conversation); (2) positive event at work, school, or volunteer position; (3) positive event at home; (4) positive network event (i.e., positive event that occurred for a close friend or family member); and (5) any other positive event* (Sin & Almeida, 2018). The NSDE Refresher Study also asked about positive nature events (i.e., *time spent enjoying or viewing nature*), but we did not include it in our analyses because this item was not asked in the NSDE 2 sample. In both samples, either none or only one positive event was reported on an average of 74% of interview days. Furthermore, past research does not support the idea that more positive events translate to additional linear increases in health or well-being benefits; rather, lack of positive events across days appears more consequential for health (Sin et al., 2015; Sin, Ong, et al., 2017). Thus, we created a dichotomous variable for *Positive Event Day*, such that days with at least one positive event were coded 1 and days without positive events were coded 0.

In the Refresher Study only, participants were asked to rate their subjective emotional experiences during each reported positive event. In particular, participants were asked how *pleasant, surprised, calm, proud*, and *close to others* they felt during the positive event, using

a 0–3 rating scale (3 = *very,* 2 = *somewhat,* 1 = *not very,* 0 = *not at all*). The correlations among the specific emotions during positive events are provided in Supplementary Table S1. The correlations ranged from .02 to .41 between-persons and from −.05 to .26 within-persons. Within-persons, emotions during positive events were only modestly correlated with same-day positive affect (r's = −.03 to .08) and were either uncorrelated or inversely correlated with same-day negative affect (r's = −.05 to .01). We therefore analyzed each item separately and did not combine them into a single composite.

Daily affect.—Daily positive and negative affect were assessed using scales developed for MIDUS (Kessler et al., 2002; Mroczek & Kolarz, 1998). Positive affect was assessed using a set of 13 items (*in good spirits, cheerful, extremely happy, calm and peaceful, satisfied, full of life, close to others, like you belong, enthusiastic, attentive, proud, active, confident*), and negative affect was assessed with 14 items (*restless or fidgety, nervous, worthless, so sad nothing could cheer you up, everything was an effort, hopeless, lonely, afraid, jittery, irritable, ashamed, upset, angry, frustrated*). Participants indicated the frequency with which they had experienced these emotions during the day, using a rating scale from 0 (*none of the time*) to 4 (*all of the time*). The reliability for Negative and Positive Affect were satisfactory (within-person = .77, between-person = .97; Reliability for Positive Affect: within-person = .86, between-person = .99; Scott et al., 2018[1]).

Data Analyses—The datasets and study materials are publicly available through the Inter-university Consortium for Political and Social Research website.[2] Code used for preparing and analyzing the data can be found on the Open Science Framework (Klaiber et al., 2021). Analyses were performed in R using the lmerTest package (Kuznetsova et al., 2017).

Parallel sets of analyses were performed in the NSDE 2 sample and Refresher sample. However, for analyses of subjective experiences during positive events, we only used data from the Refresher Study because NSDE 2 did not collect data on these items. We used multilevel regression models due to the nested structure of the data. First, to examine individual differences in positive event occurrence, we ran a 2-level logistic regression model (Level 1: days, Level 2: participants) using the Big Five factors as predictors of the probability of experiencing a positive event that day (vs. no positive event).

$$\text{Level 1}: logit\left(P_{pos\,.\,event\,.\,day}\right)_{ij} = \beta_{0j} + e_{ij};$$

$$\text{Level 2}: \beta_{0j} = \gamma_{00} + \gamma_{01} * Extraversion + \gamma_{02} * Agreeableness + \gamma_{03} * Conscientiousness + \gamma_{04} * Neuroticism + \gamma_{05} * Openness + \gamma_{0j} * covariates_j + u_{0j}$$

Second, we evaluated whether the Big Five factors are associated with event-related daily affect. Specifically, we ran 2-level models (Level 1: days, Level 2: participants) that included

interaction terms between personality traits (Level 2) and positive event occurrence (Level 1) as predictors of daily positive and negative affect. In these models, a random effect for the within-person positive event day[3] was included to allow participants to vary from one another in the associations between positive event occurrence and same-day affect.

$$\text{Level 1}: positive\ affect_{ij} = \beta_{0j} + \beta_{1j} * pos\,.\,event\,.\,day(wp) + e_{ij};$$

$$\text{Level 2}: \beta_{0j} = \gamma_{00} + \gamma_{01} * Extraversion + \gamma_{02} * Agreeableness + \gamma_{03} * Conscientiousness + \gamma_{04} * Neuroticism + \gamma_{05} * Openness + \gamma_{06} * pos\,.\,event\,.\,day(bp) + \gamma_{0j} * Covariates_j + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} * Extraversion + \gamma_{12} * Agreeableness + \gamma_{13} * Conscientiousness + \gamma_{14} * Neuroticism + \gamma_{15} * Openness + u_{1j}$$

Third, we ran 3-level models (Level 1: positive events, Level 2: days, Level 3: participants) to evaluate the Big Five factors as predictors of each of the five subjective experiences during positive events.

$$\text{Level 1}: subjective\,.\,experience_{ijk} = \pi_{0jk} + e_{ijk};$$

$$\text{Level 2}: \pi_{0jk} = \beta_{00k} + r_{0jk};$$

$$\text{Level 3}: \beta_{00k} = \gamma_{000} + \gamma_{001} * Extraversion + \gamma_{002} * Agreeableness + \gamma_{003} * Conscientiousness + \gamma_{004} * Neuroticism + \gamma_{005} * Openness + \gamma_{00k} * Covariates_k + u_{00k}$$

In all models, higher-level continuous variables were grand-mean centered, and Level 1 variables were person-mean centered to disaggregate the event-, day-, and person-levels of analysis. All of the Big Five traits were standardized and simultaneously entered into the models to account for shared variance among the traits. Because there are sociodemographic differences in the frequency of daily positive events (Sin & Almeida, 2018), the analyses covaried for age, gender, and education level (*high school graduate or lower [reference], some college,* or *college graduate*).

Results

Descriptive statistics and correlations

The NSDE 2 sample was 58% women, 85% white, and 69% of participants had at least some college education. These demographics were fairly similar for the Refresher

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[3] wp = within-person (daily variable centered on the person-mean), bp = between-person (person-mean variable centered on the grand-mean)

sample (55% women, 85% white, and 80% with some college education). Table 1 presents descriptive statistics, intraclass correlations, and within- and between-person correlations for the primary variables in the study. On average, participants reported positive events on 65–72% of days. The Big Five personality traits (except Neuroticism, which showed reversed patterns) were correlated with higher daily positive affect, lower negative affect, and more frequent positive event days. However, there were substantial inter-correlations among Extraversion, Agreeableness, and Openness. Thus, it was important to control for the shared variance among the Big Five factors.

Positive event occurrence

In the NSDE 2 sample, Extraversion and Openness uniquely predicted a greater likelihood of positive event days, controlling for the other Big Five factors and sociodemographic covariates (Table 2). The model suggests that a difference of 1 *SD* in Extraversion was related to 1.15 times higher odds of experiencing a positive event on a given day, while a difference of 1 *SD* in Openness was related to 1.21 times higher odds of experiencing a positive event on a given day. These results for Extraversion, but not Openness, were also evident in the Refresher Study (Table 2). Neuroticism, Conscientiousness, and Agreeableness were not associated with positive event occurrence. Furthermore, in the NSDE 2 sample, women, older age, and higher educational attainment predicted more frequent positive event days, whereas education was the only demographic covariate associated with positive event occurrence in the Refresher sample.

The supplemental materials (Tables S1–S5) include logistic regression models predicting daily positive event occurrence separately for each type of positive event. In the NSDE 2 sample, both Extraversion and Openness (but only Extraversion in the Refresher sample) were significant predictors of positive event occurrence in the majority of event-type specific models. In the NSDE 2 sample only, Agreeableness predicted more positive network events and Conscientiousness fewer "other" positive events. Cautious interpretation of these effects are warranted as they only emerged for one event type in one of the samples.

Event-related affect: Daily positive and negative affect

In the two samples, both positive and negative affect were higher on positive event days, compared to days with no positive events (Table 3).

NSDE 2.—In the NSDE 2 sample, Neuroticism moderated the associations between positive event occurrence and same-day positive affect (Table 3). As depicted in Figure 1, simple slope analyses revealed that the difference in positive affect between a positive event day and a non-positive event day was .06 units in people lower in Neuroticism (1 *SD* below mean, $p < .001$), whereas the difference was .10 units in people higher in Neuroticism (1 *SD* above the mean, $p < .001$). We calculated a pseudo-R^2 effect size for the reduction in random slope variance when including the cross-level interaction, based on recommendations by Singer and Willett (2003). The inclusion of the cross-level interaction for Neuroticism by Positive Event Day accounted for 1% of variance in event-related positive affect, controlling for other personality traits and covariates. Agreeableness, Conscientiousness, and Openness did not predict event-related positive affect, and none

of the Big Five factors moderated the associations between positive event occurrence and same-day negative affect.

Refresher Sample.—In the Refresher Sample, none of the Big Five factors predicted event-related positive affect. Agreeableness was the only personality trait related to greater event-related negative affect (Table 3). People lower in Agreeableness (−1 *SD* from mean) showed no difference in negative affect on days with vs. without positive events (*simple slope* = 0.00, *p* = 1), whereas people higher in Agreeableness (+1 *SD* from mean) had higher negative affect on days when positive events occurred, compared to days without positive events (*simple slope* = 0.04, *p* < .001). Inclusion of this cross-level interaction accounted for 3% of variance in event-related negative affect, controlling for other personality traits and covariates.

Emotional experiences associated with positive events

The final set of analyses were 3-level random intercept models examining distinct emotions experienced during positive events (Table 4). People higher in Agreeableness reported feeling more pleasant during positive events. Higher Agreeableness and lower Neuroticism predicted feeling more calm during positive events. Participants higher in Openness reported feeling more surprised during positive events. More conscientious people reported feeling more close to others during positive events. Higher levels of Extraversion, Agreeableness, and Conscientiousness were all linked to feeling more proud during positive events. In addition, women reported feeling more pleasant and close to others during positive events, compared to men. Older participants felt more calm but less close to others during positive events, compared to younger participants.

We further examined whether Agreeableness was related to feeling pleasant during positive events across the different event types. We found that Agreeableness only predicted feeling pleasant for the "positive social interactions" but was not associated with any other of the other positive event types (see supplementary materials, Table S7).

Discussion

The current study examines the Big Five personality traits as predictors of the occurrence of daily positive events and affective experiences associated with these events. Using data from two large national U.S. daily diary studies, we found that people higher in Extraversion (in both samples) or Openness (in NSDE 2 sample only) experienced relatively more days with positive events. In NSDE 2, people higher in Neuroticism showed greater increases in positive affect on days when positive events occurred (i.e., event-related positive affect), whereas in the Refresher sample, people higher in Agreeableness had more event-related negative affect. The Big Five factors were each related to different emotional experiences during positive events: Extraversion predicted feeling more proud; Agreeableness was associated with feeling pleasant, calm, and proud; Conscientiousness predicted feeling more close to others; Neuroticism was associated with feeling less calm, and Openness predicted feeling more surprised. To our knowledge, this study is the first to demonstrate that each Big Five personality trait uniquely relates to the subjective experience of naturally-occurring

positive events in daily life. Below, we discuss possible explanations for each of the Big Five factors, avenues for further inquiry, and implications of these findings.

Extraversion

Extraversion is characterized by a need for social stimulation (McCrae & Costa, 2008) and is closely linked to the positive affective system (Zautra et al., 2005). The present finding that Extraversion was related to greater positive event engagement in both samples is consistent with previous research (David et al., 1997; Hart & Wearing, 1995; Zautra et al., 2005). These findings can be interpreted in light of recent evidence from a randomized controlled trial linking acting more extraverted to greater daily positive affect (Jacques-Hamilton et al., 2019). Interestingly, acting more extraverted did not lead to more time spent in social interactions and resulted in greater fatigue in people low in Extraversion. These results raise questions of whether extraverted behavior is associated with actively seeking out and creating positive events, or whether people high in the trait Extraversion are more likely to interpret otherwise ordinary events as positive, and/or whether their environments provide them with more opportunities for positive events.

Contrary to our hypotheses, Extraversion did not predict differences in positive affect on days with vs. without positive events. Although unexpected given the experimental evidence on Extraversion and reward sensitivity, this result was consistent with Zautra and colleagues' (2005) finding that Extraversion did not moderate the relationship between positive event occurrence and same-day positive affect. This null result across both our samples does not align with the affective reactivity hypothesis, which posits that people higher in Extraversion react more positively to positive stimuli and that these responses accumulate over time to contribute to higher well-being (Lucas & Fujita, 2000). Support for this hypothesis comes primarily from laboratory-based studies (Gomez et al., 2000; Gross et al., 1998; Larsen & Ketelaar, 1991). A number of studies, however, have also failed to replicate Extraversion as a predictor of pleasant affective reactivity to positive stimuli (Lucas & Baird, 2004; Smillie et al., 2012, 2013). Rather, Extraversion may be related to higher arousal and activation in response to positive stimuli, instead of higher positively-valenced emotions. Further, although experimental paradigms benefit from greater control and standardized stimuli, these methods may not fully capture the active shaping and self-selection of one's environments in the context of daily life. Future research on Extraversion and positive experiences could directly examine the correspondence between lab-based affective reactivity and event-related affect in daily life, as well as disentangle arousal versus valence components of emotions associated with positive events.

With regard to event-specific emotional states assessed in the Refresher sample, we found that higher Extraversion predicted feeling more proud during positive events. One potential explanation may be that people higher in Extraversion tend to be more assertive, which may contribute to taking more active social roles (Wilt & Revelle, 2016). Indeed, agency is one of the key facets of Extraversion and is linked to feelings of pride and to taking an active approach to the formation of social roles (Depue & Morrone-Strupinsky, 2005).

Agreeableness

People higher in Agreeableness have been shown to prefer more harmonious social interactions and tend to avoid conflicts (Tobin & Gadke, 2015). Agreeableness was not related to the likelihood of experiencing positive events in either sample. However, in the Refresher sample only, higher Agreeableness predicted *higher* negative affect on positive event days vs. on days without positive events. This finding should be interpreted with caution due to its small effect size and its lack of replication across both samples. Past research has shown that daily positive events could evoke mixed emotions (e.g., an unsolicited gift that elicits feelings of indebtedness; Reich & Zautra, 1981). It is possible that people higher in Agreeableness had more ambivalent thoughts and emotions during positive events, such as concern about others' enjoyment. Given that people higher in Agreeableness prefer harmonious social interactions, they might be more sensitive to possibly ambivalent characteristics of positive social interactions, which may contribute to elevated negative affect. In addition, the Altruism and Modesty facets of Agreeableness (McCrae & Costa Jr., 2008) could foster minor feelings of guilt when positive things happen to people high in Agreeableness.

Agreeableness predicted more feelings of pleasant, calm, and pride during positive events. Increased feelings of pride might be explained by the link between Agreeableness and the authentic prosocial facet of pride (vs. the narcissistic hubristic facet of pride; Tracy & Robins, 2007), as one of the type of positive events that were assessed were positive network events (i.e. something positive happened to a close friend or family member). It could be that people high in Agreeableness take more pride when close others achieve something positive. In regard to greater feelings of pleasantness, people higher in Agreeableness might be more likely to have pleasant social interactions. This is supported by follow-up analyses showing that Agreeableness only predicted feelings of pleasure for positive social interactions but not for the other types of positive events. However, it remains unclear how much of these findings reflect personality-related patterns of responsiveness (i.e., people lower vs. higher in Agreeableness responding differently to the same types of situations) or characteristics of the external event (i.e., people lower vs. higher in Agreeableness engaging in events that differed in their pleasantness, calmness, and pride).

Conscientiousness

Contrary to our hypothesis, Conscientiousness was not related to greater engagement in positive events. Perhaps task-related pursuits—a defining factor of high Conscientiousness—are not consistently positively-valenced. For example, a task-related endeavor such as regularly cleaning the house or completing a tax return might not be appraised as positive, even by people higher in Conscientiousness. Although Conscientiousness did not predict greater engagement in positive events, people higher in Conscientiousness nevertheless reported feeling close to others and more proud during these events. It might seem surprising that Conscientiousness was associated with feeling closer to others, because theoretical accounts of Conscientiousness usually do not include a social component but rather focus on self-discipline and order (John & Srivastava, 1999). Empirical research, however, has linked Conscientiousness to greater relationship quality in couples (Holland & Roisman, 2008) and lower divorce rates (Kurdek, 1998), possibly due to greater self-discipline in relationships.

In addition, people higher in Conscientiousness may be more proud if their self-discipline enables them to have positive experiences in the pursuit of their goals (Jackson et al., 1996). Importantly, Conscientiousness did not moderate the relationship between positive event occurrence and same-day positive and negative affect. Because Conscientiousness predicted specific emotional states during positive events but not the likelihood of experiencing these events nor event-related daily affect, this underscores the value of assessing emotions within their natural contexts.

Neuroticism

Consistent with Zautra and colleagues (2005), our findings showed that people higher in Neuroticism did not lack positive events, and they even had greater increases in positive affect on positive event days in the NSDE 2 sample. These findings are in line with previous evidence that Neuroticism predicts fluctuations in affect related to daily stressors (Leger et al., 2016; Suls & Martin, 2005), as well as research suggesting that people with poorer psychological well-being show more pronounced increases in positive affect in response to positive events (Grosse Rueschkamp et al., 2020; Heininga, Van Roekel, Ahles, Oldehinkel, & Mezulis, 2017; Nezlek & Gable, 2001). However, it is worth noting in the NSDE 2 sample that even on days with positive events, people with higher Neuroticism did not reach the typically higher levels of daily positive affect observed among people lower in Neuroticism. This present effect needs to be interpreted with caution, as we only observed it in one sample. In addition, greater event-related positive affect among those higher in Neuroticism might be a function of lower positive affect levels on average. People low in Neuroticism might have more "room" on the positive affect scale to differentiate between days with and without positive events. A further caveat is that the effect size for the cross-level interaction was small. Nonetheless, given that positive events occur frequently (e.g., on 65 – 72% of days) and these processes unfold on a daily basis, the small effects might accumulate and have clinically-significant implications in the long-term for health and well-being.

Openness

Openness to experience is a trait characterized by a drive to explore and seek out novel experiences (McCrae & Costa., 2008). We found that in NSDE 2 Openness was related to greater positive event occurrence and this effect emerged consistently across most subtypes of positive events that were examined. The results from this sample suggests that people high in Openness to experience are also high in Openness to *positive* experiences. Seeking out and engaging with novel ideas in day-to-day life, a key aspect of Openness, might result in more pleasant and enjoyable events across different life domains. In addition, given the conceptualization of Openness as a trait of inquisitiveness, and unconventionality (Lee & Ashton, 2006), people high in Openness might take different and novel approaches to their daily life situations. Speculatively, this thinking "outside the box" might result in daily life situation having more favorable characteristics and these situations might be more likely to evolve into positive events. Although there are good conceptual reasons to assume Openness to be related to more frequent positive events, these results need to be interpreted with caution, as in the Refresher Sample Openness only predicted greater occurrence of "other" miscellaneous type of events.

In addition to experiencing more positive event days, people higher in Openness reported more feelings of surprise during these events. This finding is consistent with previous research indicating that people higher in Openness are more sensitive to novelty (which is conceptually linked to feelings of surprise; Fayn et al., 2015, 2017; Silvia et al., 2009, 2015). However, based on our data, we cannot fully rule out the explanation that people higher in Openness are more likely to engage in novel positive events that are surprising or if people higher in Openness are prone to responding to positive situations with higher-arousal positive emotions such as surprise. It seems likely that both processes form a person x situation interaction: People high in Openness might seek out novel positive situations, but might also be more emotionally sensitive to novel aspects of their positive events. Future research examining positive event characteristics in more detail is needed to further examine the relations between positive event experience and characteristics in people high in Openness.

Limitations and Strengths

The present study has notable strengths as well as some limitations. Regarding limitations, our measure of the Big Five contained only four to seven items for each factor. Thus, we were unable to analyze data on a facet level. In addition, because we had limited information about the characteristics of the reported positive events, we could not rule out the possibility that personality was primarily associated with external characteristics of the events (e.g., engaging in events that were calm, surprising, and so on) rather than emotional responses to or subjective experiences during the events. Future research could shed light on this question, for example, by examining cognitions and behaviors associated with the events (e.g., desirability, importance, self-agency, and control over positive events; Reich & Zautra, 1981).

Another limitation is that we relied on event-related affect as a proxy for inferring emotional responsiveness to positive events. As we are interested in naturally-occurring positive events in daily life, this study did not involve experimental manipulation of positive event occurrence to establish causality. Nonetheless, research on event-related affect can provide valuable insights about the role of personality traits in daily life experiences (Leger et al., 2016; Mroczek et al., 2015). Future daily life research using multiple assessments per day will be instrumental in establishing a temporal order between positive event occurrence and resulting affect.

Furthermore, our end-of-day reports might have been susceptible to recall biases, compared to repeated momentary assessments conducted closer in time to the actual event occurrence. Relatedly, when examining reports of emotions during positive events, we could not control for how people felt during times when they had no positive events. Thus, we were not able to examine whether the emotions reported in relation to positive events are unique to positive events or are more generally related to the Big Five personality traits. Interestingly, the correlations between emotional states during positive events and daily affect were small, suggesting that these event-specific emotions were distinct from a person's overall daily affect.

In terms of strengths, the present study employed a naturalistic study design and used two large national samples of adults across a wide age range, which contributes to the generalizability of our findings. Positive events were reported during semi-structured telephone interviews that allowed participants to judge their daily events as positive, rather than responding to a checklist of minor events that the researchers had determined were positive (Zautra et al., 1986). This assessment method ensured that we captured positive events that were relevant and idiosyncratically positive for each individual. This approach complements existing research using event checklists or standardized positive stimuli in controlled lab environments. Lastly, our study is the first to examine a set of distinct emotions during positive events.

Conclusion

In the 25 years since Bolger and Zuckerman (1995) published their person x situation framework, research has flourished on the ways in which personality and individual differences contribute to how people navigate their daily lives, particularly in the realm of stress and coping. We sought to extend Zautra and colleagues' (2005) pioneering work on daily positive events by "reloading" it with the Big Five factors and with additional measures of emotional states during positive events. In doing so, our current study is the first to provide evidence that each of the Big Five personality traits is associated with different positive event processes including the likelihood of event occurrence, event-related fluctuations in daily affect, and specific emotions during positive events. These findings add to an understanding of the richness of person-environment transactions in everyday life, which go beyond the information found in assessments of stressors and negative affect.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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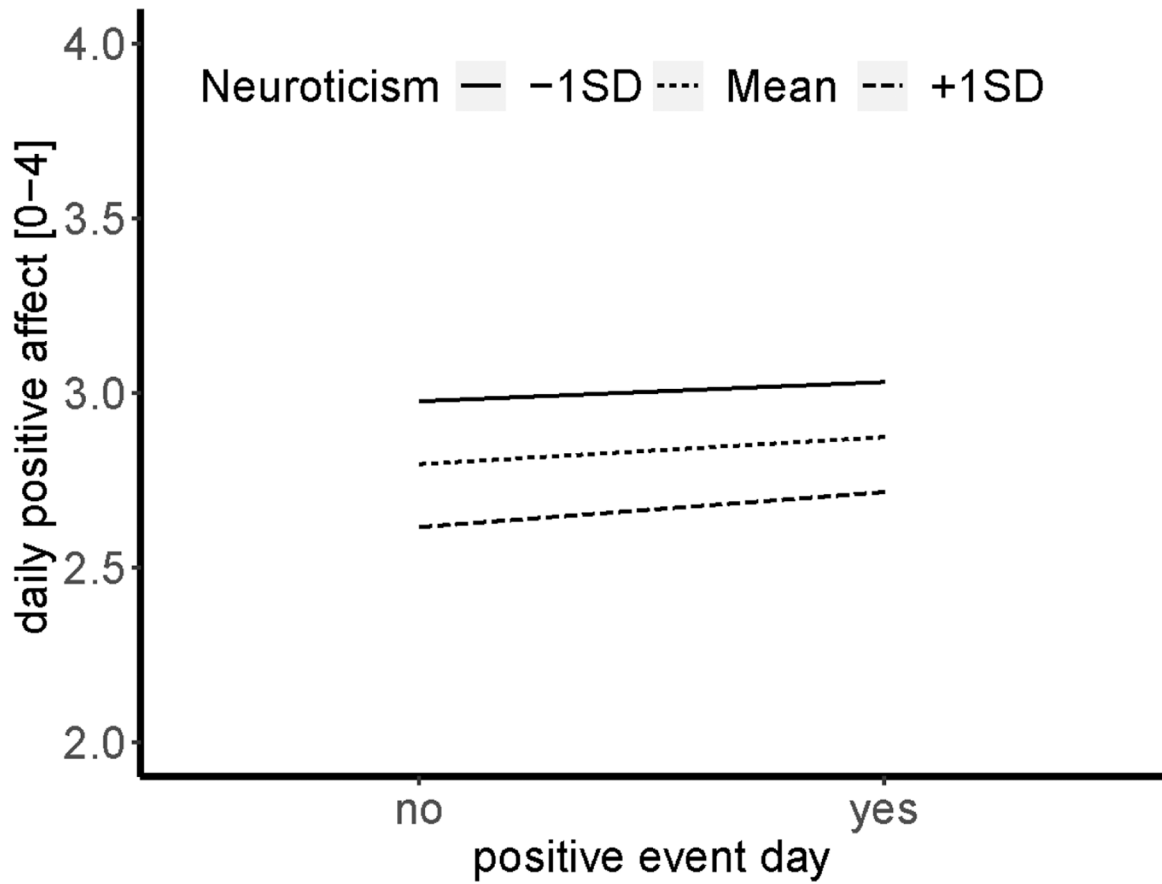
Figure 1. Neuroticism moderated the within-person association between positive event occurrence and positive affect in the NSDE 2 sample

Note. People higher in Neuroticism showed relatively greater increases in positive affect on days when positive events occurred vs. on days without positive events. Simple slopes were estimated at low (−1 *SD* from mean), moderate (mean), and high (+1 *SD* from mean) levels of Neuroticism. The figure depicts the predicted values of positive affect, controlling for all other covariates.
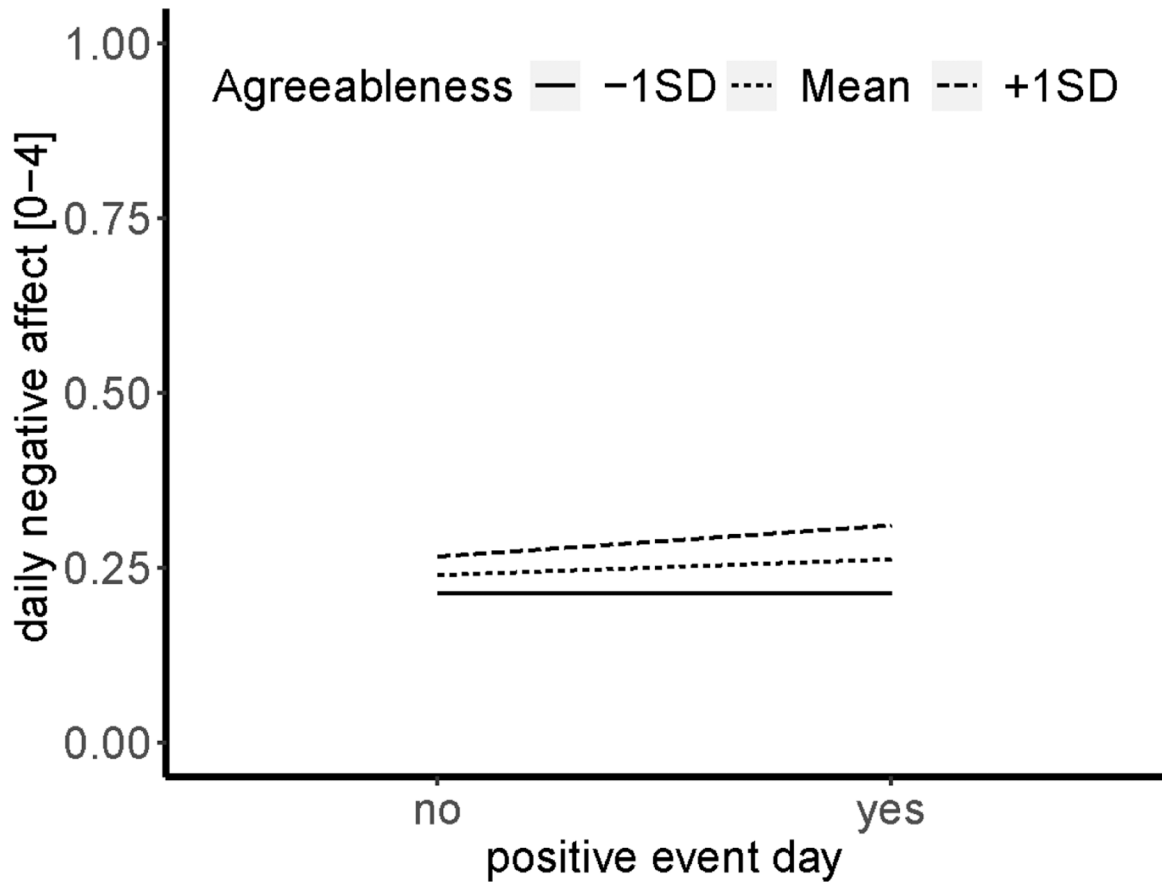
Figure 2. Agreeableness moderated the within-person association between positive event occurrence and negative affect in the Refresher sample

Note. People higher in Agreeableness showed relatively greater increases in negative affect on days when positive events occurred vs. on days without positive events. Simple slopes were estimated at low (−1 *SD* from mean), moderate (mean), and high (+1 *SD* from mean) levels of Agreeableness. The figure depicts the predicted values of negative affect, controlling for all other covariates.

Table 1

Means, standard deviations, intraclass correlations, and within- and between-person correlations among personality, affect, and positive events

| Variable	M	SD	ω	Positive event day	PA	NA	E	A	C	N	O
1. Positive event day											
NSDE 2	0.71	0.27		**.25**	.12 ***	-.03	.14 ***	.09 ***	.08 ***	-.10 ***	.20 ***
Refresher	0.62	0.28		**.22**	.10 **	.07 *	.20 ***	.16 ***	.07 *	-.04	.17 ***
2. Positive affect (PA)											
NSDE 2	2.72	0.71		.08 ***	**.75**	-.55 ***	.38 ***	.24 ***	.27 ***	-.18 ***	.20 ***
Refresher	2.53	0.75		.12 ***	**.76**	-.51 ***	.38 ***	.23 ***	.30 ***	-.36 ***	.18 ***
3. Negative affect (NA)											
NSDE 2	0.21	0.27		.03 **	-.39 ***	**.52**	-.16 ***	-.05 *	-.18 ***	.37 ***	-.07 **
Refresher	0.23	0.29		.04 **	-.43 ***	**.55**	-.14 ***	-.01	-.15 ***	.37 ***	.02
4. Extraversion (E)											
NSDE 2	3.14	0.57	.79				1	.49 ***	.28 ***	-.24 ***	.52 ***
Refresher	3.06	0.60	.80				1	.55 ***	.29 ***	-.22 ***	.45 ***
5. Agreeableness (A)											
NSDE 2	3.45	0.49	.80					1	.27 ***	-.15 ***	.33 ***
Refresher	3.36	0.53	.82					1	.32 ***	-.16 ***	.36 ***
6. Conscientiousness (C)											
NSDE 2	3.38	0.45	.70						1	-.20 ***	.33 ***
Refresher	3.35	0.50	.73						1	-.23 ***	.29 ***
7. Neuroticism (N)											
NSDE 2	2.04	0.63	.77							1	-.22 ***
Refresher	2.15	0.69	.78							1	-.24 ***
8. Openness (O)											
NSDE 2	2.94	0.53	.78								1
Refresher	2.92	0.54	.74								1

Note. Values above the diagonal are between-person correlation, values below the diagonal within-person correlations, and bolded values on the diagonal are intraclass correlations. ω = McDonalds omega as a measure of internal consistency for the baseline measures. NSDE = National Study of Daily Experiences.

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p < .05,

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p < .01,

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p < .001

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Table 2

Engagement in positive events: Random-intercept logistic multilevel regression results using positive event day as the criterion

Fixed Effects	NSDE 2 Sample			Refresher Sample		
	b	SE	OR	b	SE	OR
Intercept	0.43	0.08	1.54	−0.03	0.13	0.97
Extraversion	0.14 **	0.04	1.15	0.23 ***	0.06	1.27
Agreeableness	−0.00	0.04	1.00	0.10	0.06	1.11
Conscientiousness	0.00	0.04	1.00	−0.03	0.06	0.97
Neuroticism	−0.02	0.04	0.98	0.06	0.05	1.06
Openness	0.19 ***	0.04	1.21	0.07	0.06	1.07
Education: some college	0.59 ***	0.09	1.81	0.46 **	0.14	1.59
Education: college graduate	1.06 ***	0.09	2.87	0.83 ***	0.14	2.31
Gender (1 = Woman)	0.33 ***	0.08	1.39	0.09	0.11	1.10
Age, per 1 year	0.02 ***	0.003	1.02	0.01	0.004	1.01
Random Effects	SD			SD		
Intercept	1.16 ***			1.10 ***		

Note. Big Five factors were standardized, and age was grand mean-centered. For Education, reference group were participants without any college education. NSDE = National Study of Daily Experiences.

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 $p < .05$,

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 $p < .01$,

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 $p < .001$

Table 3

Two-level random slope models for the Big Five factors predicting positive event-related daily affect

Predictor	NSDE 2 Sample		Refresher Sample	
	Positive Affect	Negative Affect	Positive Affect	Negative Affect
	b (SE)	b (SE)	b (SE)	b (SE)
Fixed Effects				
Intercept	2.79 (0.03)***	0.20 (0.01)***	2.64 (0.06)***	0.24 (0.02)***
Positive event day (wp)	0.08 (0.01)***	0.01 (0.01)*	0.11 (0.02)***	0.02 (0.01)**
Positive event day (bp)	0.16 (0.05)***	0.02 (0.02)	0.09 (0.09)	0.12 (0.03)***
Extraversion (E)	0.19 (0.02)***	−0.03 (0.01)***	0.22 (0.03)***	−0.05 (0.01)***
Agreeableness (A)	0.01 (0.02)	0.01 (0.01)*	−0.02 (0.03)	0.03 (0.01)*
Conscientiousness (C)	0.11 (0.02)***	−0.04 (0.01)***	0.13 (0.03)***	−0.03 (0.01)**
Neuroticism (N)	−0.18 (0.02)***	0.08 (0.01)***	−0.19 (0.02)***	0.10 (0.01)***
Openness (O)	−0.04 (0.02)*	0.03 (0.01)***	−0.05 (0.03)	0.05 (0.01)***
E × pos event day (wp)	−0.02 (0.01)	−0.01 (0.01)	−0.02 (0.02)	−0.00 (0.01)
A × # pos event day (wp)	0.01 (0.01)	0.00 (0.01)	0.01 (0.02)	0.02 (0.01)*
C × # pos event day (wp)	−0.01 (0.01)	0.00 (0.01)	−0.02 (0.02)	−0.01 (0.01)
N × # pos event day (wp)	0.02 (0.01)*	0.01 (0.01)	−0.01 (0.02)	0.02 (0.01)
O × # pos event day (wp)	0.01 (0.01)	0.00 (0.01)	0.01 (0.02)	0.00 (0.01)
Education: some college	−0.02 (0.04)	−0.03(0.01)*	−0.15 (0.07)*	0.02 (0.03)
Education: college graduate	−0.11 (0.04)**	−0.01 (0.01)	−0.11 (0.06)	−0.05 (0.03)
Gender: Women	−0.03 (0.03)	0.03 (0.01)**	−0.04 (0.05)	0.01 (0.02)
Age, per 1 year	0.01 (0.001)***	−0.003 (0.0005)***	0.01 (0.002)***	−0.002 (0.0007)*
Random Effects	SD	SD	SD	SD
Intercept	0.59	0.22	0.62	0.23
Positive event day (wp)	0.17	0.12	0.19	0.09

Note. Big Five factors were standardized and age was grand mean-centered. For Education, reference group were participants without any college experience. NSDE = National Study of Daily Experiences, wp = within-person (Level 1 associations), bp = between-person (Level 2 associations);

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p < .05,

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$p < .01$,

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$p < .001$

Table 4

Three-level random-intercept model for Big Five factors as predictors of emotions during positive events (Refresher sample only; $N_{persons} = 758\text{–}760$)

Predictor	pleasant N = 760 b (SE)	ES r	calm N = 760 b (SE)	ES r	surprised N = 760 b (SE)	ES r	close to others N = 760 b (SE)	ES r	proud N = 758 b (SE)	ES r
Fixed Effects										
Intercept	3.66 (0.03) ***		3.72 (0.04) ***		2.13 (0.07) ***		3.29 (0.05) ***		3.03 (0.07) ***	
Extraversion	0.01 (0.01)	.03	-0.005 (0.02)	.00	-0.04 (0.03)	.04.	0.03 (0.02)	.06	0.08 (0.03) *	.09
Agreeableness	0.03 (0.01) *	.08	0.04 (0.02) *	.07	0.04 (0.03)	.05	0.04 (0.02)	.06	0.07 (0.03) *	.08
Conscientiousness	0.02 (0.01)	.06	0.02 (0.01)	.03	0.01 (0.03)	.01	0.05 (0.02) **	.09	0.07 (0.03) *	.08
Neuroticism	0.00 (0.01)	.01	-0.04 (0.01) ***	.14	0.00 (0.03)	.01	-0.01 (0.02)	.03	-0.02 (0.03)	.03
Openness	0.02 (0.01)	.06	-0.01 (0.02)	.02	0.09 (0.03) **	.10	0.01 (0.02)	.03	0.03 (0.03)	.03
Education: some college	-0.02 (0.03)	.02	-0.02 (0.04)	.01	-0.15 (0.08)	.07	0.05 (0.05)	.04	0.02 (0.08)	.01
Education: college graduate	-0.02 (0.03)	.03	0.01 (0.04)	.00	-0.09 (0.07)	.05	0.09 (0.05)	.07	-0.09 (0.08)	.04
Gender: Women	0.10 (0.02) ***	.18	-0.01 (0.03)	.02	0.07 (0.05)	.05	0.14 (0.04) ***	.15	0.02 (0.06)	.01
Age, per 1 year	0.001 (0.0008)	.06	0.004 (0.001) ***	.13	-0.004 (0.002)	.08	-0.003 (0.001) *	.08	-0.003 (0.002)	.05
Random Effects	**SD**									
Intercept (Level 2: Day)	0.09		0.17		0.28		0.01		0.30	
Intercept (Level 3: Person)	0.22		0.27		0.52		0.37		0.62	

Note. b represents unstandardized regression weights. Big Five factors were standardized and age was grand mean-centered. For Education, reference group were participants without any college education. ES r = Effect size r was calculated by transforming t-tests into correlation coefficients (Kashdan & Steger, 2006),

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  $p < .05$,

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  $p < .01$,

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  $p < .001$