ENGAGING IN AND RESPONDING TO DAILY POSITIVE EVENTS: ROLES OF PERSONALITY AND AGE

by

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Abstract

Mounting evidence suggests that positive events are linked to better health and well-being, yet little is known about what contributes to how frequently one engages in positive events (engagement), how one responds to these events, and how diverse these experiences are (positive event diversity). This dissertation focuses on the contributions of age and personality in the experience of daily positive events and the implications of these events for health and well-being. Study 1 (N = 776) examined age as a predictor of daily positive and negative events during the initial phase of the COVID-19 pandemic in the Spring of 2020, a time of major stress and uncertainty across all segments of society. Compared to younger and middle-aged adults, older adults experienced fewer daily stressors, more positive events, and smaller reductions in negative affect when positive events occurred. Study 2 (Ns = 1919, 778) focused on the Big Five personality traits as predictors of engagement, responsiveness, and emotional experiences during positive events. Extraversion and Openness predicted a greater likelihood of experiencing positive events in daily life, and each of the Big Five traits predicted emotions experienced during the positive events such as feelings of calm, pride, and surprise. Finally, Study 3 (Ns = 1919, 778, 1393) introduced the novel concept of positive event diversity, an index of the distribution of positive events across different event types (e.g., social, work, home, nature). Contrary to the hypotheses, positive event diversity was related to worse affective well-being for people who reported high positive event frequency but was unrelated to affective well-being for people who reported low positive event frequency. In addition, positive event diversity was not linked to any of the Big Five personality traits after controlling for positive event frequency. Collectively, this series of studies sheds light on individual differences and adult developmental factors that contribute to the types of daily positive events experienced and the affective benefits
generated from positive events. This knowledge can inform further investigations into pathways connecting positive events with long-term health as well as inform the development of interventions targeting daily positive events to bolster health and well-being.
Lay Summary

Positive events in daily life are common sources of positive emotions and can help bolster health and well-being. This research program examines the roles of age and personality traits in engaging in and responding to daily positive events. Study 1 found that older age predicted more daily positive events and fewer daily stressors during the initial phase of the COVID-19 pandemic. Study 2 showed that people with higher levels of the personality traits Extraversion and Openness are more likely to experience daily positive events and that the Big Five personality traits are linked to different emotions experienced during positive events, such as feeling calm, proud, and surprised. Finally, across three large daily diary datasets, Study 3 found that there may be no emotional cost to experiencing positive events that are similar to each other compared to experiencing positive events evenly spread across different event types (i.e., positive event diversity).
Preface

This dissertation contains a portfolio of three manuscripts that are published or in preparation, along with introductory and concluding chapters. I am the primary contributor and author of the work presented in this dissertation. Formulation of all research questions and analyses of data reported herein were performed by me, with guidance from Dr. Nancy Sin.

A manuscript resulting from the work reported in chapter 2 is published in the *Journals of Gerontology, Series B: Psychological and Social Sciences*.


I am the lead author of this publication and was responsible for reviewing the relevant literature, formulating the research questions and hypotheses, collecting the data, conducting the analyses, and drafting the manuscript. The project was approved by the UBC Behavioural Research Ethics Board, certificate number H19-04073.

A manuscript resulting from the work reported in chapter 3 is published in the Journal of Personality.

I am the first author of this article and was responsible for reviewing relevant literature, formulating the hypotheses, determining the appropriate analytic approach, conducting the analyses, and drafting the manuscript. The project was approved by the UBC Behavioural Research Ethics Board, certificate number H19-03082. Pre-existing publicly available data from the National Study of Daily Experiences, a substudy of the Midlife in the United States Study was used. The data collection was originally approved by the Education and Social/Behavioral Sciences and the Health Sciences research ethics boards at the University of Wisconsin, Madison, and The Pennsylvania State University.

A manuscript resulting from the work reported in chapter 4 is currently in preparation.


I am the lead author of this work and am responsible for reviewing the literature, drafting the research question, collecting parts of the data, conducting the data analysis, interpreting the results, and writing the manuscript. The project was approved by the UBC Behavioural Research Ethics Board, certificate numbers H19-04073 and H19-03082. In addition to data collected at UBC, pre-existing data came from the National Study of Daily Experiences, a substudy of the Midlife in the United States Study. Those data are publicly available, and data collection was originally approved by research ethics boards at the study sites, including the University of Wisconsin, Madison, and The Pennsylvania State University.
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<td>BP</td>
<td>Between-person</td>
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<td>C</td>
<td>Conscientiousness</td>
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<tr>
<td>CI</td>
<td>Confidence Interval</td>
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<tr>
<td>COVID-19</td>
<td>Coronavirus Disease 2019</td>
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<td>DISE</td>
<td>Daily Inventory of Stressful Experiences</td>
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<td>E</td>
<td>Extraversion</td>
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<td>ES</td>
<td>Effect Size</td>
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<td>ICC</td>
<td>Intraclass Correlation Coefficient</td>
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<td>M</td>
<td>Mean</td>
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<td>MIDUS</td>
<td>Midlife in the United States Study</td>
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<td>N</td>
<td>Neuroticism</td>
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<td>NA</td>
<td>Negative Affect</td>
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<td>NSDE</td>
<td>National Study of Daily Experiences</td>
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<td>O</td>
<td>Openness to Experience</td>
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<td>PA</td>
<td>Positive Affect</td>
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<td>PANAS</td>
<td>Positive and Negative Affect Schedule</td>
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<td>Positive Event Diversity</td>
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<td>Positive Event Frequency</td>
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<td>SE</td>
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<td>US</td>
<td>United States</td>
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Chapter 1: Introduction

Daily positive events (also called uplifts or pleasant events) are central to the rhythm of everyday life. These events—such as having a good conversation or spending time in nature—occur more frequently than negative events and usually result in upticks of positive emotions when they occur (Sin & Almeida, 2018). Daily positive events have been proposed to benefit health and well-being through biological, behavioural, and stress-buffering pathways (Cohen & Hoberman, 1983; Sin, Graham-Engeland, et al., 2015). In a recent meta-analysis based on 142 studies, I found that people who experience more positive events have better well-being and health across a wide variety of outcome measures, including life satisfaction, depressive symptoms, self-esteem, social connectedness, self-rated health, inflammation, and disability (Klaiber et al., in preparation). Importantly, studies have shown that these salubrious correlates of daily positive events are independent of indices of psychological distress (Sin & Almeida, 2018). These events provide unique information about psychosocial contexts in daily life that are not fully captured by stressors (Zautra et al., 2005).

1.1 A definition of positive events

Daily positive events are relatively minor and commonplace experiences that reflect transactions between the person and their environment (Sin, Graham-Engeland, et al., 2015; Zautra et al., 1986, 2005). For example, positive events occur in a variety of daily contexts (e.g., at work and school, with family, in nature, online) and often involve other people (Sin & Almeida, 2018). Daily positive events are assessed using various methods such as self-administered checklists or semi-structured interviews, and the daily events are deemed favourable or desirable based on either the respondent’s or the researcher’s judgment (Sin, Graham-Engeland, et al., 2015). Theorists have defined daily positive events as conceptually
distinct from one’s internal states, yet they influence and are influenced by emotions, cognitions, and physical states (e.g. Zautra et al., 2005). For example, based on this definition, simply feeling happy would not meet the criteria for a positive event, whereas receiving a hug from a loved one could be a positive event that then bolsters one’s happiness. Furthermore, unlike internal states that might slowly emerge and fade, positive events should have a discrete beginning and ending (Zautra et al., 1986). This condition ensures that positive events do not simply represent an ongoing sequence of activity. In addition, daily positive events should – at least in principle – be observable (Zautra et al., 1991). Observable events (such as going for a walk in nature or having a pleasant interaction) reflect transactions with the environment and are less likely to be confounded by internal states, compared to non-observable events (e.g., reminiscing about a fond memory). Finally, positive events are distinct from social interactions or transactions of social support. Although social interactions can occur as part of a positive event, positive events often happen in solitude (e.g. going for a stroll at the beach, or meditating). The defining characteristic of positive events is their appraisal as positive, desirable, and they usually fall in line with an individual’s goals (Zohar et al., 2003).

1.2 **Historical traditions of studying positive events**

The health sciences have long been interested in examining environmental influences—such as stressors—on physical health and psychosocial well-being (e.g., Kemeny, 2003; Selye, 1946). Most early research focused on major life events such as the death of a spouse or retirement (Holmes & Rahe, 1967). Although these major events require substantial adjustment from an individual, these events typically happen infrequently in the course of a lifetime. Minor life events, however, can happen on a daily basis and can elicit small biological and psychological responses that are thought to pile up over time (Zautra et al., 1986). Although
people are more likely to encounter positive events than negative events in daily life (Sin & Almeida, 2018), most systematic research has focused on processes around negative events (e.g., stressors), which have been shown to be as predictive of well-being and illness as major life events (DeLongis et al., 1982; Kanner et al., 1981; Monroe, 1983). Research on daily stress processes such as anticipation, reactivity, recovery, and habituation has steadily accumulated, and theoretical models have been proposed across disciplines to understand stress from the societal to the cellular levels of analyses (see Epel et al., 2018). By contrast, research on positive events has lagged considerably behind and there is a lack of theory to integrate the existing work and pave the way for future research (Sin & Almeida, 2018).

Although the study of daily life experiences has deep historical roots, concentrated research on the study of minor positive experiences in daily life first emerged in the 1970s. Clinical psychologists viewed a lack of pleasant events as a focal factor in the etiology of depressive disorders and thus suggested pleasant event scheduling as a therapeutic approach (Lewinsohn & Graf, 1973). This early research showed that individuals with depression engaged in fewer pleasant events than those without depression. Yet, among both depressed and non-depressed individuals, days with higher pleasant activities were related to fewer depressive symptoms (Lewinsohn & Libet, 1972).

In the 1980s, stress researchers shifted attention toward minor events (Kanner et al., 1981; Zautra et al., 1986). To study the effects of day-to-day experiences on psychological health, uplifts were introduced alongside hassles (Kanner et al., 1981). While there was strong evidence for a link between hassles and health, uplifts fell short of predicting health outcomes in early studies (DeLongis et al., 1982). Other research, however, has provided more evidence that
positive events can buffer the detrimental mental health effects of stressors (Cohen & Hoberman, 1983).

Minor positive and negative events have also been investigated to understand fluctuations in emotions (Zautra et al., 2001, 2005). According to the Dynamic Model of Affect, the positive and negative affective systems are fairly independent under safe and predictable circumstances. In times of low stress, people should be able to assess positive and negative features of a situation independently and thus separately process cues related to positive and negative affect (Zautra et al., 2005). In times of high stress, however, people prioritize negative cues (i.e., indicating threat or danger) and thus are less likely to process positive and negative cues separately. It follows that in situations of high cognitive demand, positive and negative affect become highly inversely correlated, and therefore the presence of positive events can potentially offset negative affect or stress-related responses. There has been empirical support for the Dynamic Model of Affect (Hardy & Segerstrom, 2017; Zautra et al., 2001; Zautra et al., 2005; but see Scott et al., 2014), thus suggesting that positive events can provide emotional benefits both on their own as well as in the context of elevated stress.

The inclusion of a positive event measure in the National Study of Daily Experiences (NSDE; Almeida, 2007), the largest and longest-running daily diary study in North America, has further stimulated work on daily positive events. NSDE is a substudy of the Midlife in the United States Study (MIDUS; Ryff, Almeida, Ayanian, Carr, et al., 2017). MIDUS examines multiple levels of factors—spanning social networks and neighborhoods to personality and biological functioning—to understand the role of daily life processes on health. Data from MIDUS has been used to connect positive events to better sleep (Sin et al., 2020; Tighe et al., 2016), lower inflammation (Sin, Graham-Engeland, et al., 2015), diurnal cortisol slopes (Sin et al., 2017),
lower problematic alcohol consumption (Magidson et al., 2017), and 10-year improvements in well-being among depressed individuals. Furthermore, MIDUS data has also been used to investigate cultural differences in the links between positive events and health (Clobert et al., 2020; Vanderkruik & Whisman, 2021), the role of emotion regulation in responses to positive events (Gunaydin et al., 2016), and the heritability of positive events (Whisman et al., 2014).

Although NSDE/MIDUS has spurred interest in the examination of daily positive events, these studies have mostly focused on the occurrence or frequency of positive events. More research is warranted on other aspects of positive events such as emotional responses and comparisons between different types of positive events, which are addressed in this dissertation.

1.3 Daily positive event processes: Engagement, responsiveness, and lingering effects

Daily positive events can be thought of as unfolding in a dynamic manner, embedded within social, environmental, and historical contexts (Sin & Almeida, 2018). This conceptualization is drawn from theoretical frameworks in the stress literature regarding the processes underlying person-environment interactions during stress, including the Transactional Model of Stress (Lazarus & Folkman, 1984), the Transdisciplinary Model of Stress (Epel et al., 2018), and the Dynamic Model of Affect (Zautra et al., 2005). For example, acute stress (e.g., an argument) can be distinguished by components that unfold in a temporal sequence, including anticipation before stressor onset, exposure to particular types of stressors, physiological and psychological reactivity, and recovery following the stressful encounter (Epel et al., 2018). Dynamic processes, including appraisals and coping, influence both exposure and responses to stressors (Folkman et al., 1986).

Because positive events differ in important ways from stressors, Zautra and colleagues suggested key modifications to this 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). Besides these key aspects, researchers have proposed that responses can potentially linger (Bono et al., 2013), such as when one engages in savouring or capitalizes (i.e., sharing news of the positive event) to increase the psychological benefits (Gable et al., 2004; Smith et al., 2014). In addition to these temporal processes, it might be important to consider other aspects of positive events such as their life domains (e.g., events with family or at work) or the specific emotions evoked during positive events.

1.4 An integrative model of daily positive events and health

Research on positive events has been scattered throughout multiple subdisciplines of Psychology and has usually been studied as a secondary or ancillary focus of research on other psychological constructs such as depression (e.g. Bylsma et al., 2011; Lewinsohn & Libet, 1972), affect (Zautra et al., 2005), dementia (Amspoker et al., 2019), stress (DeLongis et al., 1982), and self-esteem (Lyons & Chamberlain, 1994; Rhodewalt et al., 1998; Zeigler-Hill et al., 2010; Zeigler-Hill & Besser, 2013). More recently, there have been efforts to integrate the literature on daily positive events. Sin and Almeida (2018) proposed a conceptual model that links positive experiences in daily life (i.e., referring to both positive emotions and positive events) to long-term health through biobehavioural pathways. My colleagues and I have recently
proposed an extension of this model with a focus on positive events, as depicted in Figure 1.1 (Klaiber et al., in preparation).

This model proposes that factors at multiple levels—including social and physical environments and structures (e.g., cultural norms, income inequity, access to healthcare, neighbourhood safety, and cohesion) and individual-level factors (e.g., personality traits, major life events, work-family conflict, developmental context)—influence different aspects of daily positive events (Path A). These positive events contribute to biobehavioural pathways in daily life (Path B), including positive emotions that are elicited during positive events (and the negative emotions that might be reduced during times of stress), favourable health behaviours (e.g., better sleep), enhanced social relationships, and better physiological functioning (e.g., lower inflammation and steeper diurnal cortisol slopes). These biobehavioural pathways in turn can bolster long-term mental and physical health (Path C). Paths in the model are bidirectional to illustrate that daily positive events, behaviours, and health can influence each other. While this model is too extensive to be comprehensively evaluated within this dissertation, it serves as a framework to guide the studies included in this dissertation. Below, I provide a brief overview of supporting evidence for the conceptual model and point to key gaps in the literature that this work seeks to address.
**Figure 1.1 Conceptual model of pathways linking daily positive events with long-term mental and physical health**

*Note.* This model proposes that societal, environmental, interpersonal, and individual-level risk and resilience factors influence daily positive event processes. Daily positive events, in turn, are posited to influence downstream mental and physical health via biological and behavioural pathways. Adapted from Klaiber, Ong, & Sin (in preparation) and Sin & Almeida (2018).

### 1.4.1 Environmental, societal and individual-level factors

Past research has documented the role of environmental, societal, interpersonal, and individual-level factors in daily positive event processes. It is important to note that these factors can operate on both the individual and an ambient (or group) level. For example, on the individual level higher socioeconomic status (SES; e.g., education and income level) and white race afford people more opportunities, status, and autonomy, which are posited to contribute to societal disparities in positive psychological well-being (Boehm et al., 2015). These factors,
however, can also impact groups of people through a shared environment. For example, living in a disadvantaged neighborhood may severely restrict access to spaces that can facilitate positive events such as parks or restaurants. Indeed, sociodemographic differences in daily positive events were found in national samples of American adults. In MIDUS, people who were older, white, women, and/or more educated reported more daily positive events than those who were younger, men, less educated, and/or racial minorities (Sin & Almeida, 2018). The observed age advantage in positive events is in line with prominent theories in adult development and aging, which suggest that aging-related developmental changes in motivations and emotions lead to greater engagement in meaningful social experiences (Carstensen et al., 1999; Charles, 2010). However, much remains unknown regarding the mechanisms that link daily positive events to age-related advantages in well-being. This topic of age differences in well-being is particularly timely, given that the COVID-19 pandemic had different impacts on different age groups. While older adults are at risk for more severe health consequences due to the virus, younger adults are at greater risk for psychological distress due to societal disruptions (Rossell et al., 2021). The pandemic has also highlighted the need for safe (e.g. physically distanced) and meaningful ways to maintain social connections and bolster well-being. This dissertation seeks to gain insights into how different age groups utilized positive events during this time of major stress and uncertainty.

In addition to sociodemographics, psychological and social factors such as social roles or personality traits can influence the types and frequency of positive events by providing greater opportunities to engage in or motivation to seek out positive events. For example, higher relationship quality, as well as the personality trait Extraversion, have each been linked to greater engagement in positive events (David et al., 1997; Hart & Wearing, 1995; Tolpin et al., 2006;
Zautra et al., 2005). However, other research on the relationship between Extraversion and affective responses to daily positive events has produced mixed findings (see Study 2 for a review of the evidence). Little is known about the role of other Big Five personality traits—the most influential taxonomy of higher-order personality traits—in the experience of daily positive events.

1.4.2 Affective responses to positive events

Most research has focused on engagement in and affective responses to positive events as two core components of the positive event process (Zautra et al., 2005), while other aspects of positive events such as anticipation, lingering effects following the event, and the domains of positive events have received considerably less attention. Concerning proximal responses, past daily diary research has shown that on days with more positive events, people report higher positive affect and lower negative affect (Gable et al., 2000; Nezlek, 2005; Zautra et al., 2005) (Gable et al., 2000; Nezlek, 2005; Zautra et al., 2005), higher self-esteem (Nezlek et al., 2008; Zeigler-Hill et al., 2010; Zeigler-Hill & Besser, 2013), and higher relationship enjoyment (Tolpin et al., 2006; Totenhagen et al., 2012; Zautra et al., 2005), compared to days when they experience fewer positive events. While there has been some research examining predictors of affective responses to positive events, including Narcissism (Zeigler-Hill & Besser, 2013), Major Depression (Bylsma et al., 2011), or Extraversion (Zautra et al., 2005), other potential moderators (e.g., other personality traits) have not been investigated. Furthermore, this dissertation will fill gaps in the current literature by investigating subjective emotional experiences during positive events (event-specific emotions), as well as the diversity in the types of positive events that one experiences (event diversity).
1.4.3  Event-specific emotions and event diversity

Event diversity and event-specific emotions are two particular aspects of engagement and responsiveness to positive events, respectively, that have not received empirical attention. The most common method to assess emotional responses to positive events is to compare positive affect on days on which a positive event is experienced vs days on which no positive event is experienced (i.e. event-related affect; Sin et al., 2020). While this approach is highly useful in studying responses to positive events (Bylsma et al., 2011; Nezlek et al., 2008), it also has some shortcomings.

First, it may be important to better understand how people felt during a positive event compared to how they felt, in general, that day. These event-specific emotions can provide more information about the characteristic of people’s positive events and event-specific emotions may influence behaviors, cognitions, and emotions following the positive event. Second, event-related affect as a measure of emotional responsiveness lumps together multiple distinct emotional experiences. Moving beyond the broad assessment of “affect,” it is important to consider different emotions experienced during people’s positive events because these emotions might be linked to distinct biobehavioural pathways (Hamm et al., 2021; Pressman et al., 2017). For example, positive events that elicit feelings of calmness (e.g., reading for pleasure) might reduce activation of the sympathetic nervous system and hypothalamic-pituitary-adrenal axis, as well as increase parasympathetic activity (Park et al., 2007; Sakakibara et al., 1994). Positive events that evoke high-arousal positive emotions such as excitement, on the other hand, might increase physical activity (Sin, Moskowitz, et al., 2015). Thus, examining event-specific distinct emotions may provide a better foundation for understanding biobehavioural pathways linking positive events with health.
Past research on diversity in day-to-day stressors and activities has provided unique information that goes beyond the information found in assessments of event frequencies (Koffer et al., 2016; Lee et al., 2018). From an ecological perspective, the health of an ecosystem can be characterized by its diversity of species which indicates resource-rich environments (Magurran, 1988). Translating this perspective to the environments humans interact with, more diverse environments require the individual to employ a variety of skills but also provide resources and can fulfill a diverse set of needs. Evidence for the benefits of diversity comes from research showing that students who had more diverse social roles (i.e., number of social roles) were less susceptible to the common cold (Cohen et al., 2000), and older adults who had their stressors and activities spread across more domains tended to have better well-being (Koffer et al., 2016; Lee et al., 2018). Importantly, these links were independent of indices of social network size or stressor frequency. Considering positive event diversity, engaging in a variety of different positive events can evoke different kinds of emotions such as pride when guiding one’s child, calmness when spending time in nature, or amusement when sharing a laugh with friends. These positive emotions can broaden one's experiential horizon (Fredrickson, 2013) and therefore aid in building resources that individuals can draw upon to cope with the demands of everyday life.

1.5 Aims of this dissertation

To summarize, accumulating evidence links the frequent occurrence of positive events in daily life to better health and well-being (Klaiber et al., in preparation; Sin & Almeida, 2018). Based on the conceptual model (Figure 1.1), affective and other pathways (biological, behavioural, and stress-buffering) are proposed to underlie the association between daily positive events and downstream health. However, the literature on positive events and health lacks well-
designed and/or consistent evidence regarding specific processes involved in positive events, including predictors of engagement in positive events (e.g., in terms of frequency, types, and diversity of domains), emotional responses during these events, and the developmental (e.g., aging) and historical and social contexts (e.g., COVID-19 pandemic) in which these events occur. This dissertation aims to address these gaps in the literature by investigating the Big Five personality traits and age as individual differences and developmental contexts, respectively, that may contribute to one’s engagement in and responsiveness to daily positive events. Drawing on concepts from stress, personality, affective science, and gerontology, this work seeks to shed light on the ways in which experiences of day-to-day positive events can promote health and well-being. This dissertation consists of three studies that examine (a) the adult developmental context and personality antecedents of positive event engagement and affective responsiveness (Studies 1 and 2), (b) diversity in types of positive events (Study 3), and (c) whether daily positive events bolster affective well-being and buffer against stress during a historical macro-stressor, the COVID-19 pandemic (Study 1).
Chapter 2: Age differences in daily life experiences during the COVID-19 pandemic (Study 1)

A version of this chapter was published in the *Journals of Gerontology: Psychological Sciences*, entitled ‘The ups and down of daily life during COVID-19: Age differences in affect, stress, and positive events’.

2.1 Introduction

The novel coronavirus disease 2019 (COVID-19) pandemic has severely disrupted daily life around the world. The impacts of the pandemic vary based on social roles and risk factors that are present at different points in the adult lifespan. In particular, older age is associated with physical health risks (e.g., chronic conditions, compromised immune system) that contribute to higher rates of severe complications and mortality from COVID-19 (CDC, 2020; Zhou et al., 2020). Younger and middle-aged adults, on the other hand, are faced with family- and work-related challenges, such as working from home, homeschooling children, and unemployment. Indeed, initial research found that younger adults had more COVID-19 worries and implemented more behavioral changes than older men but not older women (Barber & Kim, 2021). Older adults perceived themselves to be at higher risk of dying if they were to contract COVID-19, yet reported better mental health and psychological functioning than their younger counterparts (Bruine de Bruin, 2020). Despite these age differences in risk perceptions and mental health, a cross-sectional survey reported that the association between the perceived impact of COVID-19 and psychological outcomes was age-invariant (Tull et al., 2020). In the current study, we used a micro-longitudinal approach to track both stressful and positive experiences as they unfolded in daily life to examine age-related patterns in psychological adjustment during the outbreak.
2.1.1 Age differences in daily well-being

Daily diary studies of U.S. adults have found that older age is associated with fewer daily stressors (Charles et al., 2010; Mroczek & Almeida, 2004) and more daily positive events (Sin & Almeida, 2018). Older adults also have higher positive affect (PA) and lower negative affect (NA) than younger adults (Charles & Carstensen, 2010), but evidence is mixed regarding age differences in affective reactivity to daily events. Some studies have indicated that older adults show relatively smaller increases in NA (Charles et al., 2009; Uchino et al., 2006) and less-decreased PA (Scott et al., 2013) when daily stressors occur, whereas other studies have found the opposite effect (Mroczek & Almeida, 2004; Wrzus et al., 2013).

Theoretical perspectives on aging and emotions posit that older age is associated with perspective and skills that help shape social environments to promote emotional well-being (Charles, 2010). In particular, older adults are more likely to use attentional, appraisal, and behavioural strategies to minimize stressful situations and should therefore show more favourable stress responses, compared to younger adults (Charles, 2010). However, when faced with unavoidable stressors that elicit high levels of distress, these age-related strengths may disappear. Indeed, when stressors affect multiple life domains (Wrzus et al., 2013) or when global perceived stress is higher (Scott et al., 2013), older adults fare the same or worse than younger adults. The sustained challenges caused by the pandemic put into question whether age-related advantages in emotional well-being will persist during this crisis.

Age differences in engagement and responsiveness to daily positive events have received little attention. Socioemotional Selectivity Theory posits that aging is accompanied by motivational shifts that lead older adults to prioritize more meaningful and pleasant social relationships and activities (Carstensen et al., 1999). Older adults would therefore be expected to
engage in more frequent positive events than their younger counterparts, which is consistent with findings from MIDUS, a large national study of adults in the United States (Sin & Almeida, 2018). This greater engagement in positive events, however, might not extend into very old age. Studies with samples that focused on old and very old age (80 years and older) found lower engagement in positive events with older age (Aldwin et al., 2014; Charles et al., 2010). In addition, these previous studies aggregated across different types of positive events (e.g., positive social interactions, work events, home events) rather than examining each of these experiences separately. Given differences in social roles across the adult lifespan (e.g., whether one is in the workforce, raising children, retired), in addition to the theorized greater priority placed on close relationships in late life, it is important to consider the particular types of positive experiences that occur at different ages. Such information will be important for informing strategies to enhance the well-being of adults at various points of the adult lifespan.

2.1.2 The aim of this study

The present study examined age differences in the perceived threat of COVID-19, as well as exposure and reactivity to daily stressors and positive events amid the pandemic. We report findings from a lifespan adult sample in Canada and the U.S., using daily diary data collected in the 25 days from March 18, 2020—just as local, provincial, and state governments began issuing stay-at-home orders—until April 11, 2020. We focused on these first several weeks of the COVID-19 response as it was likely to be the period of greatest disruption and uncertainty during the pandemic.
2.2 Method

2.2.1 Sample

Data were collected as part of the Coping with COVID-19 Outbreak Study from March 18 to April 11, 2020. Data analyses were started in mid-April 2020 to facilitate the timely dissemination of research findings. Participants were recruited through popular print, television, and radio news outlets in North America; social media (e.g., university media channels); community organizations (e.g., YMCA); and institutions (e.g., local hospitals). Participants from Canada and the U.S. ages 18-91 (N = 913) completed an online baseline questionnaire and subsequently enrolled in a 7-day diary study. Of these, 132 were excluded for completing fewer than 4 of the 7 evening surveys, and 5 were excluded due to missing values on key variables, resulting in an analytic sample of 776. Participants received email reminders every evening at 7 PM local time with a link to the daily survey. The study protocol was approved by the research ethics board at the authors’ institution.

2.2.2 Measures

2.2.2.1 COVID-19 threat

In a baseline questionnaire, participants were asked to rate 8 items that tapped into primary stress appraisals regarding the threat of COVID-19 (Pow et al., 2016, 2017; adapted from Folkman et al., 1986). Specifically, the items asked about concerns of harm to their own and to a loved one’s physical health/safety and emotional well-being, not achieving important work goals, not achieving something important to them, strain on financial resources, and losing another’s approval or respect. Ratings were made using a 4-point scale (1 = not at all, 2 = a little, 3 = a moderate amount, 4 = a great deal).
2.2.2.2 Daily affect

Daily PA and NA items were adapted from the PANAS-X (Watson & Clark, 1999). Using a slider ranging from 0 (Not at all) to 100 (Extremely), participants indicated the extent that they had felt 9 emotions for PA (calm, enthusiastic, happy, satisfied, confident, like you belong, close to others, proud, full of life) and 7 emotions for NA (anxious, sad, angry, frustrated, disgusted, lonely, ashamed). We computed indexes of reliability that showed satisfactory reliability on both within- and between-person levels (PA: within-person = .85, between-person = .99; NA: within-person = .74, between-person = .98; Scott et al., 2018).

2.2.2.3 Daily stressors

Daily stressors were assessed using a modified version of the Daily Inventory of Stressful Events (Almeida et al., 2002). Specifically, participants indicated whether any stressful events had occurred in the following 7 domains: ‘argument, conflict or disagreement’, ‘family/home-related’, ‘financial problems’, ‘traffic or transportation’, ‘health problem or accident’, ‘stressful event that happened to close friends or family’, and ‘other stressful event.’ Participants reported a daily average of 0.95 stressors (SD = 1.03). Thus, we used a dichotomous (yes/no) variable to indicate whether any stressor occurred on a given day.

If at least one stressor was reported, participants were asked follow-up questions about their most stressful event that day. First, they rated how much the stressful event was related to the COVID-19 pandemic, using a 0 (not at all) to 100 (very much) sliding scale. Perceived stressor severity was assessed by asking participants to rate how stressful the event was, from 0 (not at all stressful) to 100 (extremely stressful). Perceived stressor control was assessed by asking how much control the participant had over the situation (0 = none at all, 100 = a great deal). Perceived coping efficacy was assessed with the question, “How well do you think you
have handled the situation, given the circumstances?" (0 = not well at all, 100 = very well; Aldwin & Revenson, 1987).

2.2.2.4 Daily positive events

Participants reported whether any of the following 7 positive events occurred each day: ‘positive social interaction, in person’, ‘positive social interaction, remote’, ‘positive event at work, school, or volunteer position’, ‘positive event at home’, ‘positive event that happened to a close friend or family member’, ‘spent time enjoying or viewing nature’, and ‘other positive event’ (Sin & Almeida, 2018). Because participants tended to report multiple positive events each day, we used the number of daily positive events (rather than whether any had occurred) as an outcome.

2.2.2.5 Questions reflecting on the past week

On the final survey day, participants were asked “How stressed did you feel this past week, compared to your usual level of stress?” and “How often did you have positive experiences this past week, compared to your usual level of positive experiences?” Ratings were made on a scale ranging from 1 (A lot more than usual) to 7 (A lot less than usual), such that smaller values referred to more stress or more frequent positive experiences.

2.2.3 Analysis

Data were analyzed in R. For descriptive purposes, we first grouped participants into younger (18-39 years old), middle-aged (40-59 years old), and older (60+ years old) age groups, and we ran one-way ANOVAs and Tukey-HSD tests to examine group differences. Next, our primary analyses regarding daily events were conducted using multilevel models provided by the lmerTest package (Kuznetsova et al., 2017). Days (level 1) were nested within participants (level 2). Level 1 predictors were person-mean centered and level 2 predictors grand-mean centered.
To examine age differences in the frequency of daily positive events, age was entered as a continuous predictor of the number of daily positive events in a multilevel model. Age differences in the occurrence of daily COVID-19 stressors and of non-COVID-19 stressors (0 = stressor did not occur, 1 = stressor occurred) were examined in two separate multilevel logistic regression models. To evaluate age differences in affective reactivity to daily events, we entered 2-way interaction terms for Age by COVID-19 Stressors, by Non-COVID-19 Stressors, and by Positive Events as predictors of PA and NA. Models controlled for study day (centered on the first diary day), gender (men, women, other), education (less than college graduate vs. college graduate), and race (white vs. racial minorities). Random effects were included for study day and positive events, but not for stressor days because inclusion led to model convergence problems.

2.3 Results

2.3.1 Daily experiences in the wake of COVID-19

Descriptive statistics by age group are provided in Table 2.1, and between-person correlations are provided in Table 2.2. Compared to older adults, younger and middle-aged adults were more concerned with harm to their emotional well-being, work goals, and finances. Younger adults also had greater concerns about losing others’ respect and not achieving important goals, whereas middle-aged adults were more concerned than older adults about others’ physical health and safety. There were no age differences in concerns about harm to one’s own physical health and safety or to a loved one’s emotional well-being due to the COVID-19 pandemic.
Table 2.1 Descriptive statistics of sample of 776 adults

<table>
<thead>
<tr>
<th>Variable</th>
<th>% or Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Younger (ages 18-39)</td>
</tr>
<tr>
<td></td>
<td>n = 330</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>% Women</td>
<td>88.8%</td>
</tr>
<tr>
<td>% Other</td>
<td>2.1%</td>
</tr>
<tr>
<td>College graduate</td>
<td>73.0%</td>
</tr>
<tr>
<td>White Race</td>
<td>82.7%</td>
</tr>
<tr>
<td>Concerns about the threat of COVID-19 (1-4 scale)</td>
<td></td>
</tr>
<tr>
<td>Own physical health/safety</td>
<td>2.54 (1.00)</td>
</tr>
<tr>
<td>Own emotional well-being</td>
<td>2.86 (0.99)ab</td>
</tr>
<tr>
<td>Others’ physical health/safety</td>
<td>3.30 (0.88)</td>
</tr>
<tr>
<td>Others’ emotional well-being</td>
<td>2.99 (0.90)</td>
</tr>
<tr>
<td>Work goals</td>
<td>2.34 (1.16)ab</td>
</tr>
<tr>
<td>Finances</td>
<td>2.46 (1.06)ab</td>
</tr>
<tr>
<td>Losing others’ respect</td>
<td>1.41 (0.82)ab</td>
</tr>
<tr>
<td>Not achieving important goal</td>
<td>2.19 (1.15)ab</td>
</tr>
<tr>
<td>Daily affect and events</td>
<td></td>
</tr>
<tr>
<td>Positive affect (0-100 scale)</td>
<td>43.69 (17.29)ab</td>
</tr>
<tr>
<td>Negative affect (0-100 scale)</td>
<td>27.81 (14.48)ab</td>
</tr>
<tr>
<td>No. of positive events (0-7 scale)</td>
<td>2.24 (1.12)ab</td>
</tr>
<tr>
<td>% of days with any stressor</td>
<td>61% (26%)ab</td>
</tr>
<tr>
<td>% of COVID-19 stressor daysd</td>
<td>27% (24%)ab</td>
</tr>
<tr>
<td>Daily stress appraisals (0-100 scale)</td>
<td></td>
</tr>
<tr>
<td>Related to COVID-19 outbreak</td>
<td>56.43 (29.29)</td>
</tr>
<tr>
<td>Perceived stressor severity</td>
<td>56.21 (18.17)</td>
</tr>
<tr>
<td>Perceived control over stressor</td>
<td>30.87 (19.20)</td>
</tr>
<tr>
<td>Perceived coping efficacy</td>
<td>56.45 (17.48)ab</td>
</tr>
<tr>
<td>Comparison of past week experiences to usual experiences (1-7 scale)</td>
<td></td>
</tr>
<tr>
<td>Level of stress</td>
<td>2.47 (1.42)</td>
</tr>
<tr>
<td>Level of positive experiences</td>
<td>4.61 (1.38)</td>
</tr>
</tbody>
</table>
Note. Age was grouped into categories for descriptive purposes in this table but was entered as a continuous variable in subsequent multilevel models. Tukey-HSD was used to test for group differences. Significant group differences were denoted with superscripts:

- **a** Significant difference between younger and older adults
- **b** Significant difference between younger and middle-aged adults
- **c** Significant difference between middle-aged and older adults
- **d** COVID-19 stressors were defined as ratings above the median of 75 on the item “How much was this stressful event related to the COVID-19 outbreak?”
- **e** Asked on the final survey day; 1 = A lot more than usual, 7 = A lot less than usual

Daily diaries showed that middle-aged and older adults had higher PA and more daily positive events, compared to younger adults. Older adults had lower NA than both middle-aged and younger adults. Age was not related to the overall frequency of stressor days. However, the frequency of different types of events varied by age (Table 2.3), such that older age was associated with fewer interpersonal conflicts, family, and work/school stressors but more “other” stressors. Middle-aged adults had more in-person positive social interactions, whereas older adults had fewer work/school/volunteer positive events but more remote positive social interactions, positive events in their social networks, nature events, and “other” types of positive events. The ICCs indicated that much of the variance in affect and daily events were attributable to within-person variation (see Table 2.1).
Table 2.2 Means, standard deviations, and between-person correlations of study variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1. Age</td>
<td>45.26</td>
<td>16.16</td>
<td></td>
</tr>
<tr>
<td>2. COVID-19 threat$^a$</td>
<td>2.38</td>
<td>0.56</td>
<td>-.26**</td>
</tr>
<tr>
<td>3. Daily negative affect</td>
<td>25.70</td>
<td>15.28</td>
<td>-.16**</td>
</tr>
<tr>
<td>4. Daily positive affect</td>
<td>47.18</td>
<td>18.31</td>
<td>.21**</td>
</tr>
<tr>
<td>5. % of stressor days</td>
<td>0.60</td>
<td>0.27</td>
<td>-.07*</td>
</tr>
<tr>
<td>6. No. of daily positive events</td>
<td>2.46</td>
<td>1.13</td>
<td>.16**</td>
</tr>
<tr>
<td>7. COVID-19 stressor relevance$^b$</td>
<td>58.69</td>
<td>29.85</td>
<td>.05</td>
</tr>
<tr>
<td>8. Perceived stressor severity</td>
<td>56.05</td>
<td>19.29</td>
<td>-.02</td>
</tr>
<tr>
<td>9. Perceived control over stressor</td>
<td>29.23</td>
<td>18.73</td>
<td>-.11**</td>
</tr>
<tr>
<td>10. Perceived coping efficacy</td>
<td>58.74</td>
<td>17.45</td>
<td>.14**</td>
</tr>
</tbody>
</table>

Note. $^a$COVID-19 threat represents the average of the eight items that were used to assess concerns regarding the threat of COVID-19 ($\alpha = .72$). $^b$Person-mean for ratings of how much daily stressors were related to the COVID-19 outbreak. * indicates $p < .05$, ** indicates $p < .01$
Table 2.3 Exposure to daily stressors and positive events (i.e., proportion of days with event) by event type

<table>
<thead>
<tr>
<th>Variable</th>
<th>Younger (18-39 years old)</th>
<th>Middle-Aged (40-59 years old)</th>
<th>Older (60-91 years old)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stressor domains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>argument, conflict, or disagreement</td>
<td>0.18 (0.21)^a^</td>
<td>0.18 (0.21)^c^</td>
<td>0.12 (0.17)^ac^</td>
</tr>
<tr>
<td>family / home-related</td>
<td>0.22 (0.24)^a^</td>
<td>0.22 (0.25)^c^</td>
<td>0.16 (0.21)^ac^</td>
</tr>
<tr>
<td>work / school-related</td>
<td>0.24 (0.25)^ab^</td>
<td>0.18 (0.25)^bc^</td>
<td></td>
</tr>
<tr>
<td>financial problems</td>
<td>0.08 (0.18)</td>
<td>0.10 (0.21)</td>
<td>0.10 (0.23)</td>
</tr>
<tr>
<td>traffic or transportation</td>
<td>0.01 (0.04)</td>
<td>0.01 (0.05)</td>
<td>0.01 (0.05)</td>
</tr>
<tr>
<td>health problem or accident</td>
<td>0.07 (0.15)</td>
<td>0.09 (0.19)</td>
<td>0.09 (0.18)</td>
</tr>
<tr>
<td>stressful event that happened to close friend or family</td>
<td>0.08 (0.14)</td>
<td>0.10 (0.17)</td>
<td>0.11 (0.16)</td>
</tr>
<tr>
<td>other stressful event</td>
<td>0.10 (0.15)^ab^</td>
<td>0.16 (0.21)^bc^</td>
<td>0.20 (0.23)^ac^</td>
</tr>
<tr>
<td>Positive event domains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>positive social interaction, in-person</td>
<td>0.45 (0.35)^b^</td>
<td>0.56 (0.34)^b^</td>
<td>0.49 (0.35)</td>
</tr>
<tr>
<td>positive social interaction, remote</td>
<td>0.62 (0.32)^ab^</td>
<td>0.70 (0.29)^b^</td>
<td>0.75 (0.27)^a^</td>
</tr>
<tr>
<td>work, school, or volunteer position</td>
<td>0.17 (0.23)^a^</td>
<td>0.17 (0.23)^c^</td>
<td>0.11 (0.20)^ac^</td>
</tr>
<tr>
<td>positive event at home</td>
<td>0.41 (0.32)</td>
<td>0.46 (0.33)</td>
<td>0.41 (0.34)</td>
</tr>
<tr>
<td>positive event that happened to close friend or family member</td>
<td>0.10 (0.18)^a^</td>
<td>0.12 (0.18)^c^</td>
<td>0.17 (0.23)^ac^</td>
</tr>
<tr>
<td>spent time enjoying or viewing nature</td>
<td>0.40 (0.33)^ab^</td>
<td>0.46 (0.33)^bc^</td>
<td>0.56 (0.35)^ac^</td>
</tr>
<tr>
<td>other positive event</td>
<td>0.08 (0.17)^ab^</td>
<td>0.13 (0.20)^bc^</td>
<td>0.18 (0.23)^ac^</td>
</tr>
</tbody>
</table>

Note. N = 776 participants. Age was grouped into categories for descriptive purposes in this table. In the subsequent multilevel models, age was entered as a continuous variable. Tukey-HSD was used to test for group differences. Significant group differences were denoted with superscripts.

^aSignificant difference between younger and older adults
^bSignificant difference between younger and middle-aged adults
^cSignificant difference between middle-aged and older adults
With regard to daily stress appraisals, stressful events were largely rated above the midpoint of the scale in their relation to the COVID-19 outbreak (grand mean = 60.92, SD = 38.70, median = 75) among all age groups. Using a median split to conservatively define COVID-19 stressors, we found that middle-aged and older adults had COVID-19 stressors on nearly one-third of diary days, and younger adults had COVID-19 stressors on over a quarter of days (p > 0.05). Older adults rated themselves as having less control over their stressors but reported higher levels of coping efficacy, compared to younger adults. Although age groups differed in the types of stressors reported (Table 2.3), age was not associated with differences in perceived stressor severity (Table 2.1). Among all age groups, people rated the study week as more stressful than usual and reported having less-frequent positive experiences than usual (Table 2.1).

2.3.2 Age as a moderator of exposure and reactivity to daily events

In multilevel models (Table 2.4), age was associated with more positive events, lower NA, higher PA, and lower odds of experiencing non-COVID-19 stressors, but not the odds of experiencing COVID-19 stressors. In the models for affective reactivity to daily events, the within-person main effect for daily positive events indicated that on days when more positive events occurred than usual, PA increased and NA decreased. Likewise, on days when COVID-19 or non-COVID-19 stressors occurred compared to days without these stressors, NA increased and PA decreased. Age moderated the within-person associations of positive events and non-COVID-19 stressors with NA, such that younger adults showed the greatest decreases in NA when positive events occurred (age x positive events: $b = 0.02, SE = 0.01, p = .035$; Figure 2.1A) and more pronounced increases in NA on non-COVID-19 stressor days (age x non-COVID-19 stressor day: $b = -0.09, SE = 0.03, p = .002$; Figure 2.1B). Age did not predict NA reactivity to
COVID-19 stressors (age x COVID-19 stressor day: \( b = -0.05, SE = 0.03, p = .125 \); Figure 2.1C) nor PA reactivity to positive events or to any stressors.
Table 2.4 Multilevel models of age as a predictor of daily stressors, daily positive events, and affective reactivity to positive events and stressors

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Exposure to Daily Events</th>
<th>Affective Reactivity to Daily Events</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-COVID-19 Stressor Day</td>
<td>COVID-19 Stressor Day</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.92 (0.11)***</td>
<td>-0.79 (0.12)***</td>
</tr>
<tr>
<td>Study Day</td>
<td>-0.05 (0.02)*</td>
<td>-0.14 (0.02)***</td>
</tr>
<tr>
<td>Age</td>
<td>-0.01 (0.003)***</td>
<td>0.01 (0.004)</td>
</tr>
<tr>
<td>Men (vs. Women)</td>
<td>0.08 (0.15)</td>
<td>-0.20 (0.18)</td>
</tr>
<tr>
<td>Other Gender (vs. Women)</td>
<td>-0.16 (0.46)</td>
<td>0.52 (0.55)</td>
</tr>
<tr>
<td>College graduate (vs. no college degree)</td>
<td>0.04 (0.10)</td>
<td>0.07 (0.13)</td>
</tr>
<tr>
<td>Racial minorities (vs. white race)</td>
<td>0.11 (0.15)</td>
<td>-0.04 (0.18)</td>
</tr>
<tr>
<td>No. of Positive Events (BP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-COVID-19 Stressors (BP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COVID-19 Stressors (BP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Positive Events (WP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-COVID-19 Stressor Day (WP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COVID-19 Stressor Day (WP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD [95% CI]</td>
<td>SD [95% CI]</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.83 [0.54, 0.92]</td>
<td>1.12 [0.81, 1.22]</td>
</tr>
<tr>
<td>Study Day</td>
<td>0.02 [0.02, 0.18]</td>
<td>0.11 [0.01, 0.15]</td>
</tr>
<tr>
<td>No. of Positive Events</td>
<td>2.01 [1.18, 2.58]</td>
<td>2.32 [1.73, 2.89]</td>
</tr>
</tbody>
</table>

**Note.** N = 776 persons and 4775 days, Estimates represent unstandardized regression coefficients, CIs for random effects were estimated using 500 bootstrap samples, BP = between-person variable (person-mean), WP = within-person variable (person-centered predictor).
Fixed effects: * p < .05, ** p < .01, *** p < .001
Figure 2.1 Affective reactivity to daily positive events, non-COVID-19 stressors, and COVID-19 stressors by age

Note. Figures depict the predicted values of negative affect. For illustrative purposes, simple slopes were estimated for younger, middle-aged, and older adults at ages 25, 45 (sample mean age), and 65, respectively. Panel A: Simple slope estimates for positive events were $b$(Age = 25) = -2.79, $p < .01$; $b$(Age = 45) = -2.31, $p < .01$; $b$(Age = 65) = -1.82, $p < .01$. Panel B: Simple slope estimates for days with any non-COVID-19 stressors (vs. days without non-COVID-19 stressors) were $b$(Age = 25) = 8.90, $p < .01$; $b$(Age = 45) = 7.09, $p < .01$; $b$(Age = 65) = 5.28, $p < .01$. Panel C: Simple slope estimates for days with COVID-19 stressors (vs. days without COVID-19 stressors) were $b$(Age = 25) = 9.27, $p < .01$; $b$(Age = 45) = 8.37, $p < .01$; $b$(Age = 65) = 7.46, $p < .01$. 
2.3.3 Sensitivity Analyses

We ran two sensitivity analyses using alternative approaches for examining the COVID-19 relevance of stressors. First, we restricted our analyses to only days on which stressors were highly related to COVID-19 (i.e., rated 80-100 in COVID-19 relevance) or very low in its relevance to COVID-19 (i.e., rated 0-20), as well as days without any stressors. The previously-observed findings persisted, such that older age predicted fewer non-COVID-19 stressors ($b = -0.01, SE = 0.004, p = .03$) but was not associated with the frequency of COVID-19 stressors ($b = 0.004, SE = 0.004, p = .33$). Age continued to moderate the relationship between non-COVID-19 stressors and NA ($b = -0.11, SE = 0.03, p = .002$), but despite the effect size trending in the same direction, the age x COVID-19 stressor interaction term did not reach statistical significance ($b = -0.06, SE = 0.03, p = .07$). For our second sensitivity analysis, we tested age as a moderator of the association between the COVID-19 relevance of a stressor and NA on stressor days only (as COVID-19 relevance was not assessed on days when no stressors were reported). As shown in Table 2.4, age did not moderate the association between COVID-19 stressor relevance and NA on stressor days. Taken together, older adults had smaller increases in NA on days with non-COVID-19 stressors compared to non-stressor days, and there was a similar but non-significant trend for reactivity to COVID-19 stressors as well.
### Table 2.4 Multilevel model of age and COVID-19 stressor relevance as predictors of negative affect on stressor days

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimate</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
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<tr>
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<td>&lt;.001</td>
</tr>
<tr>
<td>Study Day</td>
<td>-0.94</td>
<td>0.13</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Age</td>
<td>-0.18</td>
<td>0.04</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Men (vs. Women)</td>
<td>-0.73</td>
<td>1.68</td>
<td>.662</td>
</tr>
<tr>
<td>Other Gender (vs. Women)</td>
<td>0.66</td>
<td>4.89</td>
<td>.892</td>
</tr>
<tr>
<td>College graduate (vs. no college degree)</td>
<td>-3.58</td>
<td>1.18</td>
<td>.003</td>
</tr>
<tr>
<td>Non-White (vs. White Race)</td>
<td>2.27</td>
<td>1.72</td>
<td>.188</td>
</tr>
<tr>
<td>COVID-19 relevance (BP)</td>
<td>0.15</td>
<td>0.02</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>COVID-19 relevance (WP)</td>
<td>0.01</td>
<td>0.01</td>
<td>.198</td>
</tr>
<tr>
<td>Age x COVID-19 relevance (BP)</td>
<td>-0.0002</td>
<td>0.001</td>
<td>.887</td>
</tr>
<tr>
<td>Age x COVID-19 relevance (WP)</td>
<td>0.00005</td>
<td>0.0006</td>
<td>.936</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Random Effects</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>12.83</td>
</tr>
</tbody>
</table>

*Note.* N = 729 persons and 2729 days. Only stressor days were included in these analyses; thus, 47 participants were excluded because they reported no stressors during the study period. Estimates represent unstandardized regression coefficients, BP = between-person variable (person-mean), WP = within-person variable (person-centered predictor).

### 2.4 Discussion

The purpose of this study was to examine age differences in the perceived threat of COVID-19, in addition to exposure and affective reactivity to daily stressors and positive events amid the outbreak in North America. Compared to older adults, younger and middle-aged adults were more concerned about the threat of COVID-19 for multiple life domains, especially
regarding their own emotional well-being, finances, and work goals. Daily diary data revealed that younger adults had greater reductions in negative affect when positive events occurred as well as greater increases in negative affect in response to stressors that were less related to COVID-19. This effect was attenuated for stressors that were very related to COVID-19 and did not reach statistical significance.

Consistent with past findings of better emotional well-being with age (Charles et al., 2010), older age was associated with higher PA, lower NA, and more frequent daily positive events. Also in line with some previous research (Charles et al., 2009; Uchino et al., 2006), older adults were less reactive to daily stressors, but this effect was more pronounced for stressors that were rated as less related to COVID-19. The results also support prior evidence that global perceived stress plays a critical role in age-related advantages in stressor reactivity (Scott et al., 2013). In past research, it has been shown that older adults can use their strengths to avoid, disengage from, or de-escalate stressful events (Charles, 2010). In the context of COVID-19, however, younger and middle-aged adults likely experience different pandemic-related stressors than older adults, which might explain the attenuated age differences in stressor reactivity.

There were no significant age differences in the frequency of COVID-19 stressors or in perceived stressor severity, but some challenges were particularly evident at different periods in the adult lifespan (e.g., interpersonal, work, and family stressors for younger and middle-aged adults). Although older adults felt less control over their stressful situations, they had higher ratings of perceived coping efficacy compared to younger adults. This is in line with past research showing that perceived control is lower in late adulthood, yet sense of mastery is maintained (Lachman, 2006). Our findings are also aligned with theoretical propositions that older adults may rely less on primary control strategies (i.e., efforts to directly change the
situation) and focus on employing secondary control strategies (e.g., positive reappraisal) that can contribute to feelings of coping efficacy (Wrosch et al., 2000). However, this explanation is merely speculative, as we did not have direct evidence of emotion regulation and coping strategies during the stressful encounters.

In contrast to the literature on daily stress, less is known about age differences in daily positive events and their implications for health and well-being across the adult lifespan (Sin & Almeida, 2018). Notably, positive experiences were prevalent in the midst of the COVID-19 pandemic, with an average of more than two positive events each day. A previous study of older women found that older age predicted fewer daily positive events (Charles et al., 2010), whereas we found that older adults reported more positive events. In particular, older adults were more likely than their younger counterparts to report physically-distanced positive events, including remote social interactions, time spent in nature, and positive events that happened to others in their social networks. Although there were no age differences in increases in PA on days with more positive events, younger adults derived more benefit from positive events in terms of reducing their NA. Thus, noticing or creating more opportunities for positive events may be a potential strategy for enhancing well-being and mitigating distress during the pandemic.

The limitations of this study should be considered when interpreting the findings. First, although our conclusions were based on age differences, people of similar chronological ages nevertheless can vary widely in their risks, life circumstances, and ability to cope with the outbreak (Fingerman & Trevino, 2020). It is possible that the results were driven less by age-related patterns in emotional well-being and more by differences in social roles across the lifespan or generational differences. Second, we were conservative in classifying stressors as related versus not related to COVID-19, but we recognize that the pandemic had pervasive
impacts across virtually all aspects of life. Thus, the “non-COVID-19 stressors” were
nevertheless somewhat related to COVID-19. Third, our data were collected during the initial
weeks of the pandemic response in North America, when the rates of COVID-19 cases and
deaths were accelerating. Age differences in concerns about COVID-19 and daily experiences
may change as the pandemic evolves and as communities reopen. Finally, as our sample was
primarily well-educated, White, and all participated via an online study, the findings may not
generalize to other populations.

The COVID-19 pandemic has led to an outbreak of ageism, in which public discourse has
portrayed older adults as a homogeneous, vulnerable group (Ayalon et al., 2021). Our
investigation of the daily life amid the outbreak suggests the opposite: Older age was associated
with less concern about the threat of COVID-19, better affective well-being, more daily positive
events, better perceived ability to cope with stressors, and less affective reactivity to non-
COVID-19 stressors. Younger and middle-aged adults, on the other hand, faced more
interpersonal conflicts and work- and family-related daily stressors. Although our findings
revealed that older adults, on average, were more psychologically resilient in the face of COVID-
19, their physical health should continue to be a major public health priority. Efforts to bolster
mental health during COVID-19 could focus on modifying stress appraisals, promoting
physically-distanced daily positive events, and should consider the COVID-19 stressors faced by
individuals at different points of the adult lifespan.
Chapter 3: Personality differences in the occurrence and affective correlates of daily positive events (Study 2)

A version of this chapter was published in the Journal of Personality, entitled ‘Personality differences in the occurrence and affective correlates of daily positive events’.

3.1 Introduction

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 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.

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). Because positive events differ in important ways from stressors, Zautra and colleagues suggested key modifications to the framework which were outlined in the general introduction. In the current study, we focus on three different aspects of
positive events that include engagement (the occurrence of a positive event), emotional experiences during the positive event, and affective responsiveness. 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).

3.1.2 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 have 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).

Concerning 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 a 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 of 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 favourable associations between Agreeableness and 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 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.

3.1.3 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., 2022). 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 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.

3.2 Method

3.2.1 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 et
Data was used from two separate samples—specifically, the second wave of MIDUS (MIDUS 2; Ryff, Almeida, Ayanian, Carr, 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.
3.2.2 Measures

3.2.2.1 Big Five Personality Factors

The Midlife Development Inventory Personality Scale was used to assess the Big Five personality factors (Lachman & Weaver, 1997). Four to seven items were used to assess each factor: Extraversion (e.g. outgoing, friendly, lively), Agreeableness (e.g. helpful, warm, caring), Conscientiousness (e.g. organized, responsible, hardworking), Neuroticism (e.g. moody, worrying, nervous), and Openness to Experience (e.g. creative, intelligent, curious). 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 3.2).

3.2.2.2 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. 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 Table 3.1. 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.

Table 3.1 Within- and between-person correlations among emotions during positive events and daily affect in the Refresher sample only (N = 758)

<table>
<thead>
<tr>
<th></th>
<th>pleasant</th>
<th>calm</th>
<th>close</th>
<th>proud</th>
<th>surprised</th>
<th>PA</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>pleasant</td>
<td>.23</td>
<td></td>
<td>.41***</td>
<td></td>
<td>.15***</td>
<td>.27***</td>
<td>-.05</td>
</tr>
<tr>
<td>calm</td>
<td>.08***</td>
<td>.26</td>
<td>.19***</td>
<td>.22***</td>
<td>.16***</td>
<td>.29***</td>
<td>-.27***</td>
</tr>
<tr>
<td>close</td>
<td>.26***</td>
<td>.10***</td>
<td>.25</td>
<td>.40***</td>
<td>.02</td>
<td>.34***</td>
<td>-.09*</td>
</tr>
<tr>
<td>proud</td>
<td>.19***</td>
<td>.07***</td>
<td>.15***</td>
<td>.40</td>
<td>.11**</td>
<td>.42***</td>
<td>-.08*</td>
</tr>
<tr>
<td>surprised</td>
<td>.06***</td>
<td>-.04*</td>
<td>-.02</td>
<td>.07***</td>
<td>.22</td>
<td>-.04</td>
<td>.16***</td>
</tr>
<tr>
<td>PA</td>
<td>.05***</td>
<td>.04**</td>
<td>.08***</td>
<td>.06***</td>
<td>-.03*</td>
<td>.79</td>
<td>-.51***</td>
</tr>
<tr>
<td>NA</td>
<td>-.03*</td>
<td>-.05***</td>
<td>-.02</td>
<td>-.02</td>
<td>.01</td>
<td>-.43***</td>
<td>.60</td>
</tr>
</tbody>
</table>

Note. Values above the diagonal are between-person correlations, values below the diagonal are within-person correlations, values on the diagonal are intra-class correlations. NA = negative affect, PA = positive affect.
* p < .05, ** p < .01, *** p < .001

3.2.2.3 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 positive and negative affect was satisfactory (Reliability for positive affect: within-person = .86, between-person = .99; Reliability for negative affect: within-person = .77, between-person = .97; Scott et al., 2018).

3.2.3 Data Analyses

The datasets and study materials are publicly available through the Inter-university Consortium for Political and Social Research website. The code used for preparing and analyzing the data can be found on the Open Science Framework (Klaiber, Wen, Ong, 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).

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

\[
\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01} * Extraversion + \gamma_{02} * Agreeableness + \gamma_{03} * Conscientiousness + \gamma_{04} * Neuroticism + \gamma_{05} * Openness + \gamma_{06} * \text{covariates}_j + u_{0j}
\]

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.

\[
\text{Level 1: } \text{positive affect}_{ij} = \beta_{0j} + \beta_{1j} * \text{pos.event.day(wp)} + e_{ij};
\]

\[
\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01} * Extraversion + \gamma_{02} * Agreeableness + \gamma_{03} * Conscientiousness + \gamma_{04} * Neuroticism + \gamma_{05} * Openness + \gamma_{06} * \text{pos.event.day(bp)} + \gamma_{07} * \text{Covariates}_j + u_{0j}
\]

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

---

\(^3\) \text{wp} = \text{within-person (daily variable centered on the person-mean)}, \text{bp} = \text{between-person (person-mean variable centered on the grand-mean)}
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.

Level 1: \( \text{subjective.experience}_{ijk} = \pi_{0jk} + e_{ijk} \);

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

Level 3: \( \beta_{00k} = \gamma_{000} + \gamma_{001} \cdot \text{Extraversion} + \gamma_{002} \cdot \text{Agreeableness} + \gamma_{003} \cdot \text{Conscientiousness} + \gamma_{004} \cdot \text{Neuroticism} + \gamma_{005} \cdot \text{Openness} + \gamma_{00k} \cdot \text{Covariates}_k + u_{00k} \)

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).

3.3 Results

3.3.1 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 sample (55% women, 85% white, and 80% with some college education). Table 3.2 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.
Table 3.2 Means, standard deviations, intraclass correlations, and within- and between-person correlations among personality, affect, and positive events

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>ω</th>
<th>Positive event day</th>
<th>PA</th>
<th>NA</th>
<th>E</th>
<th>A</th>
<th>C</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Positive event day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSDE 2</td>
<td>0.71</td>
<td>0.27</td>
<td>-</td>
<td>.25</td>
<td>.12***</td>
<td>-0.03</td>
<td>.14***</td>
<td>.09***</td>
<td>.08***</td>
<td>-1.0***</td>
<td>.20***</td>
</tr>
<tr>
<td>Refresher</td>
<td>0.62</td>
<td>0.28</td>
<td>-</td>
<td>.22</td>
<td>.10**</td>
<td>.07*</td>
<td>.20***</td>
<td>.16***</td>
<td>.07*</td>
<td>-0.04</td>
<td>.17***</td>
</tr>
<tr>
<td>2. Positive affect (PA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>NSDE 2</td>
<td>2.72</td>
<td>0.71</td>
<td>-</td>
<td>.08***</td>
<td>.75</td>
<td>-0.55***</td>
<td>.38***</td>
<td>.24***</td>
<td>.27***</td>
<td>-1.8***</td>
<td>.20***</td>
</tr>
<tr>
<td>Refresher</td>
<td>2.53</td>
<td>0.75</td>
<td>-</td>
<td>.12***</td>
<td>.76</td>
<td>-0.51***</td>
<td>.38***</td>
<td>.23***</td>
<td>.30***</td>
<td>-0.36***</td>
<td>.18***</td>
</tr>
<tr>
<td>3. Negative affect (NA)</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>NSDE 2</td>
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<td>-</td>
<td>.03**</td>
<td>-.39***</td>
<td>.52</td>
<td>-1.6***</td>
<td>-.05*</td>
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<td>0.29</td>
<td>-</td>
<td>.04**</td>
<td>-.43***</td>
<td>.55</td>
<td>-1.4***</td>
<td>-.01</td>
<td>-.15***</td>
<td>.37***</td>
<td>.02</td>
</tr>
<tr>
<td>4. Extraversion (E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSDE 2</td>
<td>3.14</td>
<td>0.57</td>
<td>.79</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>.49***</td>
<td>.28***</td>
<td>-.24***</td>
</tr>
<tr>
<td>Refresher</td>
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<td>0.60</td>
<td>.80</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>.55***</td>
<td>.29***</td>
<td>-.22***</td>
</tr>
<tr>
<td>5. Agreeableness (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSDE 2</td>
<td>3.45</td>
<td>0.49</td>
<td>.80</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-.15***</td>
<td>.33***</td>
</tr>
<tr>
<td>Refresher</td>
<td>3.36</td>
<td>0.53</td>
<td>.82</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-.16***</td>
<td>.36***</td>
</tr>
<tr>
<td>6. Conscientiousness (C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSDE 2</td>
<td>3.38</td>
<td>0.45</td>
<td>.70</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-.20***</td>
</tr>
<tr>
<td>Refresher</td>
<td>3.35</td>
<td>0.50</td>
<td>.73</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-.23***</td>
</tr>
<tr>
<td>7. Neuroticism (N)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSDE 2</td>
<td>2.04</td>
<td>0.63</td>
<td>.77</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Refresher</td>
<td>2.15</td>
<td>0.69</td>
<td>.78</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>8. Openness (O)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSDE 2</td>
<td>2.94</td>
<td>0.53</td>
<td>.78</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Refresher</td>
<td>2.92</td>
<td>0.54</td>
<td>.74</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. Values above the diagonal are between-person correlations, values below the diagonal within-person correlations, and bolded values on the diagonal are intraclass correlations. ω = Mcdonald’s omega as a measure of internal consistency for the baseline measures. NSDE = National Study of Daily Experiences. *p < .05, **p < .01, ***p < .001
3.3.2 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 3.3). 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 3.3). 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.

We also ran logistic regression models predicting daily positive event occurrence separately for each type of positive event. In both samples, Extraversion was related to the majority of positive event types (positive social interactions, work events, network events, other events). Positive events at home were only related to Extraversion in the Refresher but not in the NSDE 2 sample. Openness was related to the occurrence of all positive event types in the NSDE 2 sample but was unrelated to any positive event type in the Refresher sample. In addition, in the NSDE 2 sample only, Agreeableness predicted more positive network events and Conscientiousness fewer “other” positive events. Cautious interpretations of these effects are warranted as they only emerged for one event type in one of the samples.
### Table 3.3 Engagement in positive events: Random-intercept logistic multilevel regression results using positive event day as the criterion

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>NSDE 2 Sample</th>
<th>Refresher Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.43</td>
<td>0.08</td>
</tr>
<tr>
<td>Extraversion</td>
<td>0.14**</td>
<td>0.04</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Openness</td>
<td>0.19***</td>
<td>0.04</td>
</tr>
<tr>
<td>Education: some college</td>
<td>0.59***</td>
<td>0.09</td>
</tr>
<tr>
<td>Education: college graduate</td>
<td>1.06***</td>
<td>0.09</td>
</tr>
<tr>
<td>Gender (1 = Woman)</td>
<td>0.33***</td>
<td>0.08</td>
</tr>
<tr>
<td>Age, per 1 year</td>
<td>0.02***</td>
<td>0.003</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Random Effects</th>
<th>SD</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.16***</td>
<td>1.10***</td>
</tr>
</tbody>
</table>

*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. *p < .05, **p < .01, ***p < .001*

#### 3.3.3 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 3.4).

##### 3.3.3.1 NSDE 2

In the NSDE 2 sample, Neuroticism moderated the associations between positive event occurrence and same-day positive affect (Table 3.4). As depicted in Figure 3.1 Neuroticism moderated the within-person association between positive event occurrence and positive affect in the NSDE 2 sample. 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 the 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.

### 3.3.3.2 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 3.4). 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, \( p < .001 \); Figure 3.2). Inclusion of this cross-level interaction accounted for 3% of the variance in event-related negative affect, controlling for other personality traits and covariates.
Table 3.4 Two-level random slope models for the Big Five factors predicting positive event-related daily affect

<table>
<thead>
<tr>
<th>Predictor</th>
<th>NSDE 2 Sample</th>
<th>Refresher Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive Affect</td>
<td>Negative Affect</td>
</tr>
<tr>
<td>Fixed Effects</td>
<td>b (SE)</td>
<td>b (SE)</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.79 (0.03)***</td>
<td>0.20 (0.01)***</td>
</tr>
<tr>
<td>Positive event day (wp)</td>
<td>0.08 (0.01)***</td>
<td>0.01 (0.01)*</td>
</tr>
<tr>
<td>Positive event day (bp)</td>
<td>0.16 (0.05)***</td>
<td>0.02 (0.02)</td>
</tr>
<tr>
<td>Extraversion (E)</td>
<td>0.19 (0.02)***</td>
<td>-0.03 (0.01)***</td>
</tr>
<tr>
<td>Agreeableness (A)</td>
<td>0.01 (0.02)</td>
<td>0.01 (0.01)*</td>
</tr>
<tr>
<td>Conscientiousness (C)</td>
<td>0.11 (0.02)***</td>
<td>-0.04 (0.01)***</td>
</tr>
<tr>
<td>Neuroticism (N)</td>
<td>-0.18 (0.02)***</td>
<td>0.08 (0.01)***</td>
</tr>
<tr>
<td>Openness (O)</td>
<td>-0.04 (0.02)*</td>
<td>0.03 (0.01)***</td>
</tr>
<tr>
<td>E x pos event day (wp)</td>
<td>-0.02 (0.01)</td>
<td>-0.01 (0.01)</td>
</tr>
<tr>
<td>A x # pos event day (wp)</td>
<td>0.01 (0.01)</td>
<td>0.00 (0.01)</td>
</tr>
<tr>
<td>C x # pos event day (wp)</td>
<td>-0.01 (0.01)</td>
<td>0.00 (0.01)</td>
</tr>
<tr>
<td>N x # pos event day (wp)</td>
<td>0.02 (0.01)*</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td>O x # pos event day (wp)</td>
<td>0.01 (0.01)</td>
<td>0.00 (0.01)</td>
</tr>
<tr>
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<td>-0.02 (0.04)</td>
<td>-0.03 (0.01)*</td>
</tr>
<tr>
<td>Education: college graduate</td>
<td>-0.11 (0.04)**</td>
<td>-0.01 (0.01)</td>
</tr>
<tr>
<td>Gender: Women</td>
<td>-0.03 (0.03)</td>
<td>0.03 (0.01)**</td>
</tr>
<tr>
<td>Age, per 1 year</td>
<td>0.01 (0.001)***</td>
<td>-0.003 (0.0005)***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Random Effects</th>
<th>SD</th>
<th>SD</th>
<th>SD</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.59</td>
<td>0.22</td>
<td>0.62</td>
<td>0.23</td>
</tr>
<tr>
<td>Positive event day (wp)</td>
<td>0.17</td>
<td>0.12</td>
<td>0.19</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*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); *p < .05, **p < .01, ***p < .001
Figure 3.1 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 3.2 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.

3.3.4 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 3.5). 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 Table 3.6).
Table 3.5 Three-level random-intercept model for Big Five factors as predictors of emotions during positive events (Refresher sample only; N = 758-760)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>pleasant (N = 760)</th>
<th>calm (N = 760)</th>
<th>surprised (N = 760)</th>
<th>close to others (N = 760)</th>
<th>proud (N = 758)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effects</td>
<td>b (SE)</td>
<td>ES r</td>
<td>b (SE)</td>
<td>ES r</td>
<td>b (SE)</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.66 (0.03)***</td>
<td>3.72 (0.04)***</td>
<td>2.13 (0.07)***</td>
<td>3.29 (0.05)***</td>
<td>3.03 (0.07)***</td>
</tr>
<tr>
<td>Extraversion</td>
<td>0.01 (0.01)</td>
<td>-0.005 (0.02)</td>
<td>-0.04 (0.03)</td>
<td>0.03 (0.02)</td>
<td>0.08 (0.03)*</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.03 (0.02)</td>
<td>0.04 (0.03)</td>
<td>0.04 (0.03)</td>
<td>0.04 (0.02)</td>
<td>0.07 (0.03)*</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.02 (0.01)</td>
<td>0.02 (0.03)</td>
<td>0.01 (0.03)</td>
<td>0.05 (0.02)</td>
<td>0.07 (0.03)*</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>0.00 (0.01)</td>
<td>-0.04 (0.03)</td>
<td>0.00 (0.03)</td>
<td>-0.01 (0.02)</td>
<td>-0.02 (0.03)*</td>
</tr>
<tr>
<td>Openness</td>
<td>0.02 (0.01)</td>
<td>-0.01 (0.02)</td>
<td>0.09 (0.02)</td>
<td>0.01 (0.02)</td>
<td>0.03 (0.03)*</td>
</tr>
<tr>
<td>Education: some college</td>
<td>-0.02 (0.03)</td>
<td>-0.02 (0.04)</td>
<td>-0.15 (0.03)</td>
<td>0.05 (0.05)</td>
<td>0.02 (0.06)</td>
</tr>
<tr>
<td>Education: college graduate</td>
<td>-0.02 (0.03)</td>
<td>0.01 (0.04)</td>
<td>-0.09 (0.07)</td>
<td>0.09 (0.05)</td>
<td>-0.09 (0.08)</td>
</tr>
<tr>
<td>Gender: Women</td>
<td>0.10 (0.02)***</td>
<td>-0.01 (0.03)</td>
<td>0.07 (0.05)</td>
<td>0.14 (0.04)**</td>
<td>0.02 (0.06)*</td>
</tr>
<tr>
<td>Age, per 1 year</td>
<td>0.001 (0.0008)</td>
<td>0.004 (0.001)</td>
<td>-0.004 (0.002)</td>
<td>-0.003 (0.001)*</td>
<td>-0.003 (0.002)</td>
</tr>
<tr>
<td>Random Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept (Level 2: Day)</td>
<td>0.09</td>
<td>0.17</td>
<td>0.28</td>
<td>0.01</td>
<td>0.30</td>
</tr>
<tr>
<td>Intercept (Level 3: Person)</td>
<td>0.22</td>
<td>0.27</td>
<td>0.52</td>
<td>0.37</td>
<td>0.62</td>
</tr>
</tbody>
</table>

56
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), * \(p < .05\), ** \(p < .01\), *** \(p < .001\)

Table 3.6 Two-level random-intercept models for Big Five factors as predictors of feelings of pleasantness during different positive event types (Refresher sample only; \(N_{\text{persons}} = 206-746\))

<table>
<thead>
<tr>
<th>Predictor</th>
<th>social interactions</th>
<th>events at home</th>
<th>work events</th>
<th>network events</th>
<th>“other” events</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N = 746)</td>
<td>(N = 276)</td>
<td>(N = 430)</td>
<td>(N = 206)</td>
<td>(N = 220)</td>
</tr>
<tr>
<td>Fixed Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>3.66 (0.03)**</td>
<td>3.61 (0.08)***</td>
<td>3.72 (0.05)***</td>
<td>3.65 (0.10)***</td>
<td>3.73 (0.09)***</td>
</tr>
<tr>
<td>Extraversion</td>
<td>0.02 (0.02)</td>
<td>0.02 (0.04)</td>
<td>0.00 (0.03)</td>
<td>-0.03 (0.04)</td>
<td>0.00 (0.04)</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.03 (0.01)*</td>
<td>0.00 (0.04)</td>
<td>0.01 (0.02)</td>
<td>0.05 (0.05)</td>
<td>0.01 (0.05)</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.01 (0.01)</td>
<td>0.01 (0.03)</td>
<td>0.09 (0.02)***</td>
<td>0.04 (0.04)</td>
<td>-0.01 (0.04)</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>0.00 (0.01)</td>
<td>-0.07 (0.03)*</td>
<td>0.03 (0.02)</td>
<td>0.02 (0.04)</td>
<td>-0.03 (0.04)</td>
</tr>
<tr>
<td>Openness</td>
<td>0.02 (0.01)</td>
<td>0.03 (0.03)</td>
<td>0.04 (0.02)</td>
<td>0.03 (0.05)</td>
<td>-0.00 (0.04)</td>
</tr>
<tr>
<td>Education: some college</td>
<td>0.01 (0.04)</td>
<td>-0.08 (0.09)</td>
<td>-0.03 (0.06)</td>
<td>-0.09 (0.11)</td>
<td>-0.03 (0.10)</td>
</tr>
<tr>
<td>Education: college graduate</td>
<td>-0.01 (0.03)</td>
<td>-0.20 (0.09)*</td>
<td>-0.01 (0.05)</td>
<td>-0.03 (0.10)</td>
<td>0.07 (0.10)</td>
</tr>
<tr>
<td>Gender: Women</td>
<td>0.13 (0.03)***</td>
<td>0.16 (0.06)*</td>
<td>0.01 (0.04)</td>
<td>0.05 (0.07)</td>
<td>0.02 (0.07)</td>
</tr>
<tr>
<td>Age, per 1 year</td>
<td>0.002 (0.001)</td>
<td>-0.00 (0.00)</td>
<td>-0.00 (0.00)</td>
<td>0.01 (0.003)*</td>
<td>0.00 (0.00)</td>
</tr>
</tbody>
</table>

Random Effects

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept (Level 2: Day)</td>
<td>0.23</td>
</tr>
</tbody>
</table>

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. * \(p < .05\), ** \(p < .01\), *** \(p < .001\)
3.4 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.

3.4.1 Extraversion

Extraversion is characterized by a need for social stimulation (McCrae & Costa Jr., 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 behaviour is associated with actively seeking out and creating positive events, 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). Several 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 regards 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).

3.4.2 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 types 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. Regarding 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).

3.4.3 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.

When designing our hypotheses, we followed previous work that has grouped Conscientiousness with Extraversion and Openness as traits representing an agentic component (de Vries et al., 2016). Other influential work, however, has grouped Conscientiousness with Agreeableness and argued that these two traits reflect a communal conformist orientation, while Extraversion and Openness reflect a dynamic agentic orientation (Gebauer et al., 2013; Paulhus & John, 1998; Saucier, 2009). They suggested that Extraversion and Openness are about changing one’s environment while Agreeableness and Conscientiousness are about stabilizing it (DeYoung, 2006). Given that Conscientiousness was not related to greater positive event engagement but greater feelings of closeness to others, the present results seem to be more aligned with this view of Conscientiousness as a communal and not an agentic trait.
3.4.4 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 et al., 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 for health and well-being in the long-term (Götz et al., 2022).

3.4.5 Openness

Openness to experience is a trait characterized by a drive to explore and seek out novel experiences (McCrae & Costa Jr., 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 suggest 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 situations having more favourable 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.
3.4.6 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 into 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.

3.4.7 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.
Chapter 4: Positive Event Diversity: Relationship with Personality and Well-being (Study 3)

A version of this chapter entitled ‘Positive Event Diversity: Relationship with Personality and Well-being’ is currently being prepared for publication.

4.1 Introduction

Ecology has long emphasized that it is insufficient to merely count the number of organisms to understand the health of a given environment; rather, the focus should be centered on the interactive system of organisms and their equilibrium (Tansley, 1935). Healthy ecosystems with many resources can support a large number of different species, each with a diverse set of needs. On the contrary, resource-poor environments can often only support a few highly adapted species (Magurran, 1988). Furthermore, because different species depend on each other, a reduction in the diversity of an ecosystem often results in a decrease in the overall health of the ecosystem.

In recent years, daily life researchers have applied these lessons from ecology by moving away from only considering how often a given psychological experience (e.g., a stressor or an emotion) occurs. Instead, they have emphasized that it is important to consider the diversity of daily events, activities, and emotions to better understand how daily life shapes long-term health and well-being (Benson et al., 2018). A prime example is the concept of stressor diversity in daily life, defined as the extent to which people experience their daily stressors across different categories, such as arguments, work stressors, and family stressors. People with low diversity in their stressor types tend to have poorer affective well-being compared to people with stressors spread across different categories (Koffer et al., 2016). In this case, low stressor diversity likely indicated that the same stressors had occurred repeatedly and that this chronicity of stressors may
be detrimental to well-being. A different study found that the diversity of engagement in different daily life activities—such as household chores, physical activity, paid work—was related to higher eudaimonic well-being (e.g. purpose, mastery) in older adults but lower well-being in younger adults (Lee et al., 2018). This diversity of activities may reflect the strain of many obligatory roles among younger adults, whereas it may be an indicator of social integration in older adults (Lee et al., 2018). Importantly, this study did not show significant links between activity diversity and positive or negative affect, thus it remains unclear whether the diversity of daily positive experiences is related to daily affect.

Relatedly, some work has connected higher emodiversity (i.e., the capacity to experience a wide number of distinct emotions such as joy, calm, and excitement) with better indicators of health and well-being, including lower depressive symptoms, fewer doctor visits (Quoidbach et al., 2014), fewer physical symptoms (Urban-Wojcik et al., 2022), as well as lower circulating levels of inflammation (Ong et al., 2018). Importantly, emodiversity can account for variance in these health outcomes over and above a person’s average levels of positive and negative emotions. This line of past work, however, does not emphasize the context – such as events and activities – that gives rise to the diversity of emotions.

4.1.1 Daily Positive Events and Positive Event Diversity

This paper proposes positive event diversity as a novel metric that indicates the extent to which positive events are spread across different event types, such as positive work events, spending time in nature, and positive social interactions. For example, a person with low positive event diversity might report five positive events in a given week, but all of them at work. On the other hand, a person with high positive event diversity might also report five positive events, yet these events could be spread across a variety of domains such as work, home, relationships, and
nature. In particular, we are interested in exploring both the personality and well-being correlates of experiencing a wide range of different positive event types in daily life.

4.1.2 Personality Traits as Predictors of Positive Event Diversity

The first aim of this paper is to locate positive event diversity within the plane of individual differences, specifically the Big Five personality traits. We and others have previously shown that personality traits predict exposure to and affective correlates of daily positive events (Hart & Wearing, 1995; Klaiber et al., 2022; Zautra et al., 2005). Among the Big Five traits, Extraversion and Openness to Experience in particular predicted a greater likelihood of experiencing positive events, perhaps due to these traits’ agentic components (de Vries et al., 2016; Klaiber et al., 2022). It is not clear, however, whether these traits would also predict a greater diversity of positive events across different types of positive events.

Openness describes the “breadth, depth, originality, and complexity of an individual’s mental and experiential life” (John et al., 2008, p. 220). Openness reflects a need for intellectual stimulation and exposure to novel situations (Costa Jr. & McCrae, 2008). While Openness has long been thought of as an intrapsychic trait that mostly captures differences in active imagination, aesthetic sensitivity, and intellectual curiosity, the trait also has important implications for how people interact with their environment. One core facet of Openness is Preference for Variety (also called Adventurousness; Costa & McCrae, 1992; Soto & John, 2009), which describes a preference for novel and intense experiences. This preference has been shown to translate into more diverse interests and activities in daily life. For example, people with high Openness prefer a variety of different musical forms and genres (Dollinger, 1993; Greenberg et al., 2016), and are more open to becoming friends with people outside their racial group (Antonoplis & John, 2022). In addition, Openness has been linked to a greater diversity of
daily activities (Jackson et al., 2020) and specifically a greater engagement in cultural activities that require the processing of novel ideas, such as going to the opera or a modern art gallery (Schwaba et al., 2018). Finally, people higher in Openness had more diverse interests as indicated by their Facebook likes, and they engaged in more diverse events based on their phone’s GPS data (Matz, 2021). Given that both theoretical and empirical investigations suggest that Openness is linked to more diverse interests and activities, we hypothesized that people higher in Openness would experience more diverse positive events in their daily lives.

While Openness is characterized by a need for diverse experiences, Extraversion is mostly characterized by a need for social stimulation (Lee & Ashton, 2006). Thus, people higher in Extraversion tend to have large social networks and more social interactions (Lucas et al., 2008; Srivastava et al., 2008). As Extraversion has a substantial agentic component (i.e., assertiveness; de Vries et al., 2016), it is not surprising that people higher in Extraversion frequently seek out and create more positive events (Hart & Wearing, 1995; Klaiber et al., 2022; Zautra et al., 2005). The majority of these positive events are likely to consist of positive social interactions instead of other positive event types, such as spending time in nature, visiting an art gallery, or meditating. Indeed, there is no evidence that Extraversion is associated with a greater diversity of interests or experiences (Dollinger, 1993; Matz, 2021). Therefore, we expect people with higher Extraversion to engage in more positive events, but these events will likely cluster in the positive social interaction category. In other words, we hypothesize that Extraversion would be related to lower positive event diversity.

In this research, we primarily focus on Extraversion and Openness as the two key personality dimensions that have been linked to daily positive events in past research (Klaiber et al., 2022; Zautra et al., 2005). However, past work has also connected the other Big Five traits
(e.g., Agreeableness, Conscientiousness) to different aspects of positive events such as the emotions experienced during positive events (Klaiber et al., 2022). Thus, on an exploratory basis, we will include all Big Five traits in our analyses.

*H1a: Openness to Experience will predict greater positive event diversity.*

*H1b: Extraversion will predict lower positive event diversity.*

### 4.1.3 Positive Event Diversity and Affective Well-being

Although experiencing more positive events can provide benefits for well-being (Klaiber, Wen, DeLongis, et al., 2021; Zautra et al., 2005), it might also be favourable to experience daily positive events spread across different event types. Experiencing different types of positive events might provide benefits across different domains of a person’s life by fulfilling a diverse set of needs. For example, various daily positive events such as engaging in a positive social interaction, achieving a milestone at work, or being engrossed in a hobby might be driven by distinct sets of emotional, social, and cognitive needs and collectively can contribute to greater well-being.

These ideas are in line with theories on multiple social roles and role accumulation. Occupying multiple social roles can provide purpose, meaning, guidance, and direction to one’s life and thus foster psychological well-being (Thoits, 1983). It may be that experiencing positive events in diverse contexts is one way through which role accumulation can contribute to psychological well-being. It should be noted, however, that occupying multiple social roles can also lead to role strain and greater stress (Sieber, 1974). Therefore, experiencing many positive events in diverse contexts may also contribute to greater daily life strain. For instance, a person who juggles many positive events in very different life domains may be stretched in terms of time, cognitive (e.g. attention, planning), or social resources. Thus, positive event diversity may
be less beneficial for a person experiencing a high frequency of positive events. This idea is partly derived from research on stressor diversity, which suggests that stressor diversity is only associated with greater negative affect in people who experience stressors relatively frequently but unrelated to daily affective well-being in people who experience few daily stressors (Koffer et al., 2016). Thus, in addition to examining the well-being correlates of positive event diversity, we also evaluated on an exploratory basis whether the frequency of positive events may moderate the relationship between positive event diversity and daily affective well-being.

*H2: People with greater positive event diversity will have better daily affective well-being, as indicated by higher person-mean daily positive affect and lower negative affect.*

*Exploratory Research Question: Positive event frequency will be evaluated as a moderator of this relationship.*

### 4.1.4 Personality as a Moderator of the Link between Positive Event Diversity and Well-being

Much of the work on personality and daily life diversity has examined personality as a predictor of diversity (Jackson et al., 2020; Matz, 2021), but there is no research to date on whether personality may play a moderating role in the relationship between daily life diversity and well-being. It may be that positive event diversity is only linked to better well-being among people with certain personality traits. For example, given that a key facet of Openness is the need for variety (*Adventurousness*; Costa & McCrae, 1992), we propose that this need for variety may prompt people higher in Openness to be relatively more emotionally receptive to positive events that happen across different positive event types as opposed to the same type of positive event happening repeatedly. Each new positive event of a different type may provide the opportunity to engage with novel information and different contextual features, thus making these events more
appealing to people with high levels of Openness. Thus, we expect that the link between positive event diversity and better daily well-being will be augmented in people higher in Openness and attenuated in people lower in Openness.

**H3:** *Openness to Experience will moderate the link between positive event diversity and daily affective well-being, such that higher levels of Openness will predict stronger links whereas lower Openness will predict weaker associations.*

### 4.2 Methods

#### 4.2.1 Samples

To examine the relationships of positive event diversity with affective well-being and personality traits, we used data from three daily diary studies. Specifically, two independent samples came from the National Study of Daily Experiences (NSDE; second wave and Refresher sample; Ryff et al., 2017; Ryff & Almeida, 2017) and one sample came from the Coping with the COVID-19 Outbreak Study (COVID-19 study; Klaiber, Wen, DeLongis, et al., 2021; Zheng et al., 2021). We present brief descriptions of the samples and procedures below. Demographic and descriptive statistics of the main variables can be found in Table 4.1. All analyses and hypotheses were preregistered on the Open Science Framework⁴. We initially only preregistered analyses on the COVID-19 Study, but then decided to include parallel analyses with the NSDE 2 and Refresher samples to ensure that our results were not driven by the pandemic context. In addition, the analyses examining the interaction between frequency and diversity were not preregistered and need to be evaluated as exploratory.

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⁴ https://osf.io/sh5n8/?view_only=abe8fd501d404f858461177056475752
4.2.1.1 National Study of Daily Experiences

Data were drawn from the second wave of the National Study of Daily Experiences (NSDE 2) and the Refresher sample (NSDE Refresher). Both samples are part of the larger Midlife in the United States Study (MIDUS). NSDE 2 consisted of 2,022 individuals who were randomly drawn from the MIDUS 2 sample (5,555 adults, ages 35-85), whereas the Refresher sample consisted of 782 individuals who were randomly drawn from the MIDUS Refresher sample (3,577 adults, ages 25-75). Personality and demographic data were obtained from a questionnaire administered approximately 1-2 years before the daily diary period. In both samples, participants took part in 8 consecutive days of semi-structured nightly telephone interviews that asked about their daily positive events and affect. For the present analyses, the NSDE 2 sample consisted of 1,919 participants, and the NSDE Refresher sample of 744 participants after excluding people who completed fewer than four daily diaries or who had missing values on key analytical variables.

4.2.1.2 Coping with the COVID-19 Outbreak Study

We used daily diary data from the Coping with the COVID-19 Outbreak Study (Klaiber, Wen, DeLongis, et al., 2021), collected between March and August 2020 to examine daily life experiences during the initial period of the COVID-19 pandemic. We combined data from the community sample (n = 1206) that was recruited through coverage in news and social media and ads distributed to community organizations, with data from a student sample (n = 414) that was recruited through a human subject pool at a public university in Canada. Participants first completed a baseline survey that assessed demographics, personality, and other psychosocial measures. Subsequently, they were invited to enroll in a daily diary substudy. During the daily diary period, participants received email prompts at 7 pm local time for 7 consecutive days to
complete the online surveys via the Qualtrics platform. These nightly surveys asked about their daily positive events and affect. The analytic sample for the COVID-19 Study consisted of 1,393 people who completed at least 4 of the 7 daily surveys and who did not have missing values for any key analytical variables.

4.2.2 Measures

4.2.2.1 Big Five Personality

4.2.2.1.1 NSDE 2 and Refresher.

In both NSDE 2 and Refresher, the Midlife Development Inventory Personality Scale was administered to assess the Big Five Personality traits (Lachman & Weaver, 1997). Each factor was assessed with four to seven items: Extraversion (e.g. outgoing, friendly, lively), Agreeableness (e.g. helpful, warm, caring), Conscientiousness (e.g. organized, responsible, hardworking), Neuroticism (e.g. moody, worrying, nervous), and Openness to Experience (e.g. creative, intelligent, curious). Using a scale from 1 (a lot) to 4 (not at all), participants rated how well each of these adjectives described them. 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 and ranged from .74 to .82 (see Klaiber, Wen, Ong, et al., 2021).

4.2.2.1.2 COVID-19 Study

The Coping with the COVID-19 Study used a 10-item version of the Big Five Inventory (BFI-10; Rammstedt & John, 2007) to assess the Big Five Personality traits. This measure was chosen to lower participant burden and maximize retention. Participants rated how well each of the 10 statements described them on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Internal consistencies were low because each of the Big Five traits was only represented by two
items, which is common for parsimonious scales that aim to maintain construct breadth (Clifton, 2020; Gosling et al., 2003). In our sample, alphas ranged from .33 for Agreeableness to .67 for Extraversion. Sufficient reliability has been shown through high retest correlations and validity through part-whole correlations with the BFI-44 scales in validation studies (Rammstedt & John, 2007).

4.2.2.2 Daily Affect

4.2.2.2.1 NSDE 2 and Refresher

In both NSDE 2 and the Refresher sample, positive and negative affect were measured using scales developed for MIDUS (Kessler et al., 2002; Mroczek & Kolarz, 1998). Participants indicated how often they had experienced the listed emotions that day, using a rating scale from 0 (none of the time) to 4 (all of the time). Thirteen items were used to assess positive affect (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 14 items for negative affect (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). We computed indexes of between-person reliability for the positive affect and negative affect subscales, finding that the subscales had high reliability (R > .97).

4.2.2.2.2 COVID-19 Study

The COVID-19 Study assessed positive and negative affect with a modified version of the PANAS-X (Watson & Clark, 1999), designed to capture intra- and interindividual variability in emotions across different adult age groups (Charles et al., 2019). Participants were asked how well each of a list of emotions described how they had felt that day. Participants made their ratings using a slider with anchors at 0 = not at all and 100 = extremely. Positive affect was
assessed with 9 items (enthusiastic, happy, satisfied, confident, calm, like you belong, close to others, proud, full of life) and negative affect with 7 items (anxious, sad, angry, frustrated, disgusted, lonely, ashamed). Between-person reliabilities were excellent for both positive and negative affect (R > .98; Klaiber, Wen, DeLongis et al., 2021).

4.2.2.3 Daily Positive Events

Positive events were assessed in all studies using an adapted version of the Daily Inventory of Stressful Events (Almeida et al., 2002). Every evening, participants were asked whether a positive event had occurred for each category presented. NSDE 2 inquired about positive events in the following five categories: positive social interaction; positive event at work, school, or volunteer position; positive event at home; positive event that happened to a close friend or family member; other positive event. NSDE Refresher and the COVID-19 Study included an additional item inquiring about enjoying or viewing nature. Due to physical distancing restrictions in the spring and summer of 2020, the COVID-19 Study also differentiated between positive social interactions that happened in person versus those that happened remotely. Thus, positive events were assessed with five categories in NSDE 2, six categories in NSDE Refresher, and seven categories in the COVID-19 Study. Positive event frequency was calculated by taking the average number of positive events a person reported on a given day.

4.2.2.4 Positive Event Diversity

Shannon’s Entropy was used to compute a measure of positive event diversity, analogous to the procedures for computing stressor diversity outlined by Koffer and colleagues (2016). This index provides a measure of whether the different positive event types were endorsed evenly by the participants in their daily surveys.
Positive Event Diversity = \(-\left(\frac{1}{\ln(m)}\right)\sum_{j=1}^{m} p_{ij}\ln p_{ij}\)

i = individuals

j = positive event types

m = number of available positive event categories (i.e., 5-7)

p_{ij} = proportion of individual’s i’s positive events that were in each category, j = 1 to m

Scores can range from 0 (no positive event diversity: all positive events in only one category, or no positive events endorsed) to 1 (maximum positive event diversity: positive events evenly dispersed across all positive event types). Because the diversity index is standardized by the number of positive event types assessed in each study, scores from different datasets with a different number of positive event types are comparable.

4.2.3 Data Analysis

Parallel analyses were conducted in each dataset and results were synthesized with random effects meta-analyses using the metafor package in R (Viechtbauer, 2010). Daily positive and negative affect were computed for each person on each day by taking the mean of the items. The person-means of the daily affect scores were used in the models of interest as an indicator of daily affective well-being. Similarly, the daily average number of positive events reported by a person was used as a measure of positive event frequency. We used ordinary least squares regression to test our hypotheses. All continuous variables were centered on grand means.
to enable the interpretation of the intercept and main effects of models that included interaction terms.

To examine Hypothesis 1, we tested the Big Five traits as predictors of positive event diversity. For Hypothesis 2, separate models were run to evaluate positive event diversity as a predictor of positive and negative affect. An interaction term between positive event diversity and frequency was included to evaluate whether the link between positive event diversity and affective well-being differed depending on the person’s frequency of daily positive events. We also ran sensitivity analyses controlling for negative affect in models predicting positive affect, and vice versa. The results were similar, so we present the results from the parsimonious models without the other valence of affect. For Hypothesis 3, we examined whether any of the Big Five traits moderated the link between positive event frequency and positive or negative affect. To test this, we included interaction effects between each of the Big Five traits and the positive event diversity variable in our models. All analyses covaried for positive event frequency, age, education (0 = no college degree, 1 = college degree or higher), and gender (0 = men, 1 = women). In analyses for the COVID-19 Study, we also covaried for “other gender” (vs. men) and for the student vs. community-based subsamples.

4.3 Results

Descriptive statistics for the main variables of all three samples can be found in Table 4.1. Across the three samples, on average, participants reported between one and two positive events per day. The grand mean for positive event diversity was slightly above 0.5 (range = 0-1), suggesting that positive events were dispersed near the scale midpoint between no dispersion to absolute dispersion. Across the three samples, on average, individuals reported about 3-4 different types of positive events across the week-long diary period. Table 4.2 shows zero-order
correlations of our study variables with positive event diversity. The random-effect meta-analytical results summarizing the correlations across the three samples suggest that positive event diversity was positively correlated with positive affect, but not with negative affect. Concerning the Big Five, on a zero-order level, Extraversion, Agreeableness, and Openness were linked to higher and Neuroticism to lower positive event diversity. Importantly, positive event diversity shared approximately 50% of the variance with positive event frequency \( (r = .73) \), which supports the need to control for the shared variance between diversity and frequency in the regression models.

Table 4.1 Means, SDs, and relative frequencies of analytic variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>NSDE 2 (N = 1919)</th>
<th>NSDE Refresher (N = 744)</th>
<th>COVID-19 Study (N = 1392)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>PE Frequency</td>
<td>1.03 (0.63)</td>
<td>1.26 (0.70)</td>
<td>2.23 (1.16)</td>
</tr>
<tr>
<td>PE Diversity</td>
<td>0.49 (0.30)</td>
<td>0.54 (0.22)</td>
<td>0.66 (0.20)</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>2.72 (0.71)</td>
<td>2.52 (0.75)</td>
<td>45.84 (18.20)</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>0.21 (0.27)</td>
<td>0.22 (0.27)</td>
<td>26.16 (15.44)</td>
</tr>
<tr>
<td>Extraversion</td>
<td>3.14 (0.57)</td>
<td>3.06 (0.59)</td>
<td>3.17 (0.92)</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>3.45 (0.49)</td>
<td>3.36 (0.53)</td>
<td>3.54 (0.71)</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>3.38 (0.45)</td>
<td>3.35 (0.50)</td>
<td>3.63 (0.83)</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>2.04 (0.63)</td>
<td>2.14 (0.69)</td>
<td>3.13 (0.96)</td>
</tr>
<tr>
<td>Openness</td>
<td>2.94 (0.53)</td>
<td>3.35 (0.50)</td>
<td>3.65 (0.85)</td>
</tr>
<tr>
<td>Age</td>
<td>56.29 (12.15)</td>
<td>48.19 (12.63)</td>
<td>39.59 (17.67)</td>
</tr>
<tr>
<td><strong>Rel. Frequency (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (woman)</td>
<td>57.7 %</td>
<td>55.4 %</td>
<td>83.5 %</td>
</tr>
<tr>
<td>Education (college degree or higher)</td>
<td>38.4 %</td>
<td>50.4 %</td>
<td>55.0 %</td>
</tr>
<tr>
<td>Community Sample vs. Student Sample</td>
<td>--</td>
<td>--</td>
<td>74.3 %</td>
</tr>
</tbody>
</table>

Note. Positive Event (PE) Frequency could range from 0-5 for NSDE 2, from 0-6 for NSDE Refresher, and 0-7 for the COVID-19 Study. Positive Event (PE) Diversity could range from 0-1 for all datasets. Positive and Negative Affect could range from 0-4 in the NSDE studies and from 0-100 in the COVID-19 study. The personality scales could range from 1-4 for the NSDE datasets and from 1-5 for the COVID-19 study.
Table 4.2 Zero-order correlations of study variables with Positive Event Diversity

<table>
<thead>
<tr>
<th>Variable</th>
<th>NSDE 2 (N = 1919)</th>
<th>NSDE Refresher (N = 744)</th>
<th>COVID-19 Study (N = 1392)</th>
<th>Meta-Analysed Across 3 Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Event Frequency</td>
<td>.75***</td>
<td>.71***</td>
<td>.74***</td>
<td>r = .73; 95% CI = [.72; .74]</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>.08***</td>
<td>.12***</td>
<td>.41***</td>
<td>r = .24; 95% CI = [.00; .41]</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>.02</td>
<td>.09*</td>
<td>-.19***</td>
<td>r = -.03; 95% CI = [-.19; .13]</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.14***</td>
<td>.20***</td>
<td>.13***</td>
<td>r = .15; 95% CI = [.12; .18]</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.10***</td>
<td>.15***</td>
<td>.08**</td>
<td>r = .10; 95% CI = [.07; .13]</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.05*</td>
<td>.06</td>
<td>.25***</td>
<td>r = .12; 95% CI = [-.01; .25]</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.08***</td>
<td>-.05</td>
<td>-.13***</td>
<td>r = -.09; 95% CI = [-.13; -.04]</td>
</tr>
<tr>
<td>Openness</td>
<td>.19***</td>
<td>.19***</td>
<td>.07**</td>
<td>r = .14; 95% CI = [.07; .22]</td>
</tr>
</tbody>
</table>

Note. Random effect meta-analyses were conducted to synthesize the correlations from the three different data sets. * p < .05, ** p < .01, *** p < .001

4.3.1 H1: Links of Positive Event Diversity with the Big Five

Multiple regression models did not show consistent links between personality and positive event diversity (Table 4.3). Instead, across all three studies, positive event frequency emerged as the strongest predictor of positive event diversity (standardized β > .70). The only link with personality emerged in the NSDE 2 sample, in which people higher in Conscientiousness tended to show lower positive event diversity across the study period compared to people lower in Conscientiousness. This effect, however, was not observed in any of the other studies. In meta-analyses of effect sizes across the three samples, there were no associations between any of the Big Five traits and positive event diversity, after controlling for positive event frequency.
Table 4.3 Regression results of the Big Five personality traits predicting positive event diversity

<table>
<thead>
<tr>
<th>Variable</th>
<th>NSDE 2 (N = 1919)</th>
<th>NSDE Refresher (N = 744)</th>
<th>COVID-19 Study (N = 1392)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b (SE)</td>
<td>β</td>
<td>b (SE)</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.50 (0.02)***</td>
<td>0.54 (0.01)***</td>
<td>0.65 (0.02)***</td>
</tr>
<tr>
<td>Extraversion</td>
<td>0.01 (0.01)</td>
<td>.01</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.02 (0.01)</td>
<td>.03</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>-0.02 (0.01)*</td>
<td>-.03</td>
<td>-0.01 (0.01)</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-0.00 (0.01)</td>
<td>-.01</td>
<td>0.00 (0.01)</td>
</tr>
<tr>
<td>Openness</td>
<td>0.01 (0.01)</td>
<td>.02</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td>Positive Event Frequency</td>
<td>0.35 (0.01)***</td>
<td>.74</td>
<td>0.23 (0.01)***</td>
</tr>
<tr>
<td>Age</td>
<td>-0.002 (0.001)***</td>
<td>-.06</td>
<td>-0.00 (0.00)</td>
</tr>
<tr>
<td>Gender (Woman)</td>
<td>-0.01 (0.01)</td>
<td>-.02</td>
<td>-0.01 (0.01)</td>
</tr>
<tr>
<td>Gender (Other)</td>
<td>---</td>
<td>---</td>
<td>0.04 (0.04)</td>
</tr>
<tr>
<td>Education (College or higher)</td>
<td>-0.01 (0.01)</td>
<td>.03</td>
<td>-0.00 (0.01)</td>
</tr>
<tr>
<td>Sample (Community vs Student)</td>
<td>---</td>
<td>---</td>
<td>-0.04 (0.01)***</td>
</tr>
</tbody>
</table>

Note. In the NSDE samples, only male and female were assessed for gender. b = unstandardized regression coefficient, SE = standard error for unstandardized regression coefficient, β = standardized regression coefficient, * p < .05, ** p < .01, *** p < .001
4.3.2  H2: Positive Event Diversity and Affective Well-being

4.3.2.1  Daily Positive Affect

The multiple regression models did not provide any evidence for our hypothesis that positive event diversity would be linked to higher positive affect. Instead, when accounting for positive event frequency and demographic covariates, positive event diversity was associated with lower person-mean daily positive affect in the NSDE 2 sample but not in the two other samples (Table 4.4). However, positive event frequency was a significant moderator of the association between positive event diversity and positive affect in both the NSDE 2 and the COVID-19 samples. Random effects meta-analyses summarizing the results from the three samples confirmed evidence for a significant frequency x diversity interaction: $\beta = -.07$, 95%-$CI = [-.10; -.04]$. When examining random slopes (see Figure 4.1A-C), a pattern emerged among the three samples. Positive event diversity was not linked to daily positive affect for people who experienced fewer positive events, but positive event diversity appeared to be associated with lower daily positive affect for people who experienced many positive events, especially in the NSDE 2 sample.

4.3.2.2  Daily Negative Affect

Contrary to our expectations, positive event diversity tended to be linked to higher, not lower negative affect, at mean levels of positive event frequency (Table 4.5). When synthesizing the three effect sizes in meta-analytical models, there was a modest statistically significant positive relationship between positive event diversity and negative affect: $\beta = .04$, 95%-$CI = [.01; .08]$. The meta-analytic result suggests that for a person with an average level of positive event frequency, having positive events spread across more positive event types was linked to slightly higher person-mean daily negative affect. This effect, however, also needs to be
interpreted in light of positive event frequency, as there was a significant interaction between event diversity and frequency in both the NSDE 2 and the COVID-19 samples, which was confirmed by a random-effects meta-analysis: \( \beta = .09, 95\%-CI = [.05;.12] \). A clear pattern emerged among the three samples when examining the simple slopes (Figure 4.1D-F). Positive event diversity was linked to greater levels of person-mean daily negative affect among people who experienced more frequent daily positive events, while this link was non-significant among people who experienced less frequent daily positive events.
Table 4.4 Regression results of Big Five personality traits, positive event frequency, positive event diversity, and their interaction predicting person-mean positive affect

<table>
<thead>
<tr>
<th>Variable</th>
<th>NSDE 2 (N = 1919)</th>
<th>NSDE Refresher (N = 744)</th>
<th>COVID-19 Study (N = 1392)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b (SE)</td>
<td>β</td>
<td>b (SE)</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.87 (0.05)**</td>
<td>2.59 (0.05)**</td>
<td>48.07 (1.33)**</td>
</tr>
<tr>
<td>Positive Event Frequency</td>
<td>0.18 (0.04)**</td>
<td>0.12 (0.06)*</td>
<td>8.56 (0.65)**</td>
</tr>
<tr>
<td>Positive Event Diversity</td>
<td>-0.18 (0.08)*</td>
<td>-0.16 (0.18)</td>
<td>-2.73 (4.11)</td>
</tr>
<tr>
<td>Positive Event Frequency x PED</td>
<td>-0.28 (0.09)**</td>
<td>-0.24 (0.15)</td>
<td>-5.02 (2.10)*</td>
</tr>
<tr>
<td>Extraversion</td>
<td>0.33 (0.03)***</td>
<td>0.36 (0.05)***</td>
<td>0.10 (0.45)</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.02 (0.04)</td>
<td>-0.04 (0.06)</td>
<td>1.33 (0.58)***</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.26 (0.03)***</td>
<td>0.27 (0.05)***</td>
<td>0.49 (0.52)</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-0.28 (0.02)***</td>
<td>-0.27 (0.04)***</td>
<td>-3.77 (0.45)***</td>
</tr>
<tr>
<td>Openness</td>
<td>-0.08 (0.03)*</td>
<td>-0.11 (0.05)*</td>
<td>-0.89 (0.47)</td>
</tr>
<tr>
<td>Extraversion x PED</td>
<td>-0.25 (0.11)*</td>
<td>-0.09 (0.24)</td>
<td>0.04 (2.33)</td>
</tr>
<tr>
<td>Agreeableness x PED</td>
<td>0.08 (0.11)</td>
<td>-0.10 (0.24)</td>
<td>0.11 (2.74)</td>
</tr>
<tr>
<td>Conscientiousness x PED</td>
<td>0.12 (0.11)</td>
<td>0.16 (0.24)</td>
<td>5.33 (2.54)***</td>
</tr>
<tr>
<td>Neuroticism x PED</td>
<td>0.02 (0.08)</td>
<td>0.05 (0.15)</td>
<td>2.87 (2.10)</td>
</tr>
<tr>
<td>Openness x PED</td>
<td>0.38 (0.10)***</td>
<td>0.06 (0.23)</td>
<td>2.22 (2.43)</td>
</tr>
<tr>
<td>Age</td>
<td>0.01 (0.001)***</td>
<td>0.01 (0.002)***</td>
<td>0.06 (0.03)</td>
</tr>
<tr>
<td>Gender (Woman)</td>
<td>-0.05 (0.03)</td>
<td>-0.05 (0.05)</td>
<td>-3.33 (1.14)**</td>
</tr>
<tr>
<td>Gender (Other)</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Education (College or higher)</td>
<td>-0.11 (0.03)***</td>
<td>-0.03 (0.05)</td>
<td>0.62 (0.91)</td>
</tr>
<tr>
<td>Sample (Community vs Student)</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. PED = positive event diversity. In the NSDE samples, only male and female were assessed for gender. b = unstandardized regression coefficient, SE = standard error for unstandardized regression coefficient, β = standardized regression coefficient, * p < .05, ** p < .01, *** p < .001
Table 4.5 Regression results of Big Five personality traits, positive event frequency, positive event diversity, and their interaction predicting person-mean person-mean negative affect

<table>
<thead>
<tr>
<th>Variable</th>
<th>NSDE 2 (N = 1919)</th>
<th>NSDE Refresher (N = 744)</th>
<th>COVID-19 Study (N = 1392)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b (SE)</td>
<td>β</td>
<td>b (SE)</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.12 (0.02)***</td>
<td>0.24 (0.02)***</td>
<td>25.17 (1.31)***</td>
</tr>
<tr>
<td>Positive Event Frequency</td>
<td>-0.09 (0.02)***</td>
<td>-0.20</td>
<td>0.02 (0.02)</td>
</tr>
<tr>
<td>Positive Event Diversity</td>
<td>0.16 (0.03)***</td>
<td>0.18</td>
<td>0.11 (0.07)</td>
</tr>
<tr>
<td>Positive Event Frequency x PED</td>
<td>0.18 (0.04)***</td>
<td>0.13</td>
<td>0.06 (0.06)</td>
</tr>
<tr>
<td>Extraversion</td>
<td>-0.06 (0.01)***</td>
<td>-0.12</td>
<td>-0.09 (0.02)***</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.03 (0.01)*</td>
<td>0.05</td>
<td>0.05 (0.02)*</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>-0.09 (0.01)***</td>
<td>-0.15</td>
<td>-0.06 (0.02)**</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>0.13 (0.01)***</td>
<td>0.30</td>
<td>0.14 (0.02)***</td>
</tr>
<tr>
<td>Openness</td>
<td>0.06 (0.01)***</td>
<td>0.12</td>
<td>0.10 (0.02)***</td>
</tr>
<tr>
<td>Extraversion x PED</td>
<td>0.06 (0.04)</td>
<td>0.04</td>
<td>0.06 (0.09)</td>
</tr>
<tr>
<td>Agreeableness x PED</td>
<td>-0.00 (0.05)</td>
<td>0.00</td>
<td>-0.01 (0.09)</td>
</tr>
<tr>
<td>Conscientiousness x PED</td>
<td>-0.03 (0.05)</td>
<td>-0.02</td>
<td>0.03 (0.09)</td>
</tr>
<tr>
<td>Neuroticism x PED</td>
<td>0.02 (0.03)</td>
<td>0.01</td>
<td>0.14 (0.06)*</td>
</tr>
<tr>
<td>Openness x PED</td>
<td>-0.09 (0.04)*</td>
<td>-0.05</td>
<td>-0.04 (0.09)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.002</td>
<td>-0.09</td>
<td>-0.002 (0.001)*</td>
</tr>
<tr>
<td>Gender (Woman)</td>
<td>0.04 (0.01)**</td>
<td>0.07</td>
<td>0.01 (0.02)</td>
</tr>
<tr>
<td>Gender (Other)</td>
<td>---</td>
<td>--</td>
<td>---</td>
</tr>
<tr>
<td>Education (College or higher)</td>
<td>0.01 (0.01)</td>
<td>0.02</td>
<td>-0.05 (0.02)**</td>
</tr>
<tr>
<td>Sample (Community vs Student)</td>
<td>---</td>
<td>--</td>
<td>---</td>
</tr>
</tbody>
</table>

*Note.* PED = positive event diversity. In the NSDE samples, only male and female were assessed for gender. b = unstandardized regression coefficient, SE = standard error for unstandardized regression coefficient, β = standardized regression coefficient, *p < .05, **p < .01, ***p < .001
Figure 4.1 Simple slopes for the interaction of Positive Event Diversity x Positive Event Frequency predicting both Positive (A-C) and Negative Affect (D-F) in the three samples.

Note. See Tables 4.4 and 4.5 for full model statistics. Significance of simple slopes is indicated by asterisks: * $p < .05$, ** $p < .01$, *** $p < .001$
4.3.3  H3: The Big Five as Potential Moderators of the Link between Positive Event Diversity and Daily Well-being

Although the diversity of positive events did not emerge as a unique predictor of daily positive affect, the link might only be present among people with certain personality traits such as high Openness. Thus, we examined the Big Five as potential moderators of the link between positive event diversity and daily well-being (i.e., positive and negative affect). Our models indicated that there was no consistent evidence for any of the Big Five as a moderator across the three studies. However, some noticeable results emerged in single studies (Tables 4.4 & 4.5).

4.3.3.1  Daily Positive Affect

Our hypothesis that Openness would moderate the positive event diversity well-being link was only confirmed in the NSDE 2 sample. People low in Openness (1 SD below the mean) showed a significant inverse association between positive event diversity and positive affect \((\text{simple slope} = -0.39, p < .01)\), but this association was not significant among people higher in Openness \((\text{simple slope} \text{ for } 1 \text{ SD above the mean Openness} = 0.02, p = .86; \text{ Figure 4.2})\). This effect was unique to the NSDE 2 sample, and Openness was not a significant moderator in a meta-analysis across the three studies.
Similarly, in the NSDE 2 sample only, Extraversion moderated the link between positive event diversity and daily person-mean positive affect. People higher in Extraversion (1 SD above the mean) showed a significant negative link between positive event diversity and person-mean positive affect (\(simple slope = -.33, p < .01\)), whereas people lower in Extraversion (1 SD below the mean) did not show a link (\(simple slope = -.04, p = .70\), Figure 4.3). However, this moderating effect was unique to the NSDE 2 sample, and meta-analyzing the interaction terms from the three samples did not reveal evidence for Extraversion as a moderator.
Figure 4.3 Extraversion as a moderator of the link between positive event diversity and positive affect in the NSDE 2 sample

In addition, in the COVID-19 Study only, Conscientiousness moderated the association between positive event diversity and person-mean daily positive affect. Simple slope analyses indicated, however, that positive event diversity was not significantly linked to positive affect at any observed level of Conscientiousness (Figure 4.4).
**Figure 4.4 Conscientiousness as a moderator of the link between positive event diversity and positive affect in the COVID-19 sample**

4.3.3.2 Daily Negative Affect

Neuroticism was a significant moderator of the link between positive event diversity and daily negative affect in the NSDE Refresher and the COVID-19 study, but in opposite directions (Table 4.5). In the NSDE Refresher sample, people high in Neuroticism (1 SD above the mean) showed a significant positive link between positive event diversity and daily negative affect (*simple slope* = 0.20, *p* = .01), but not those lower in Neuroticism (*simple slope* = 0.02, *p* = .86; Figure 4.5). In the COVID-19 study, however, the opposite pattern was observed. People higher in Neuroticism did not show a link (*simple slope* = 4.11 *p* = .36), while people low in Neuroticism showed a significant positive link (*simple slope* = 15.59, *p* < .01; Figure 4.6). Like all other interaction terms, random effect meta-analyses indicated that this effect was not consistent across the three studies.
Figure 4.5 Neuroticism as a moderator of the link between positive event diversity and negative affect in the NSDE Refresher sample
4.4 Discussion

This study aimed to examine positive event diversity and its well-being and personality correlates across three large lifespan samples of adults. We found no evidence for our hypothesis that people who experience more diverse positive events would have better daily affective well-being. On the contrary, when synthesizing effect sizes across the three samples, there was evidence for higher positive event diversity being linked to less favourable daily well-being, but only among people who reported an average-to-high frequency of daily positive events. Concerning personality correlates, there was no evidence for our hypothesis that people higher in Openness would experience positive events spread across more categories. Although zero-order correlations showed links between positive event diversity and different personality traits, these links disappeared when adjusting for positive event frequency. Finally, despite interesting patterns emerging in different samples when examining the Big Five personality traits as
moderators of the link between positive event diversity and affective well-being, these effects were not consistent across the three studies. These results suggest that there might be no affective advantage for experiencing positive events spread across more event types versus concentrated among fewer event types. Rather, the frequency of positive events was more consequential for affective well-being than the diversity of positive event types.

4.4.1 Positive Event Diversity and Personality

Our hypotheses were based on prior theory and findings that people higher in Openness have more diverse interests and would seek out a greater variety of daily experiences (Matz, 2021). Contrary to our expectations, we did not find higher positive event diversity among people higher in Openness versus those lower in Openness, after adjusting for positive event frequency. Past research has shown that higher Openness contributes to the tendency to engage in idea-related endeavors and to seek out intellectual stimulation (Ashton & Lee, 2007; Schwaba et al., 2018), which in turn may translate to a higher frequency of daily positive events evenly distributed across different positive event types (Klaiber et al., 2022). However, our results did not support this prediction, as the greater diversity of positive events among people high in Openness could be fully explained by their tendency to engage in positive events more frequently. The drive of high-Openness individuals to seek out novel positive situations such as going to an art gallery or trying out a new meditation routine may result in a greater diversity of positive events, but at the same time also in a higher frequency of positive events. This suggests that Openness may contribute to behaviors that are associated with both greater frequency and diversity of positive events. Due to the overlap of these constructs, however, positive event diversity may not provide additional information about the daily lives of people high in Openness beyond what is indicated by positive event frequency.
Findings from our largest samples provided some evidence for Openness as a moderator of the association between positive event diversity and well-being. Contrary to our expectations, people higher in Openness did not report higher positive affect if they experienced higher positive event diversity, but people low in Openness reported lower positive affect if they experienced higher positive event diversity. This suggests that people low in Openness may be more comfortable with their positive events happening within similar contexts compared to experiencing positive events across more diverse contexts. Although this effect confirms our initial hypotheses that Openness might moderate the affective correlates of positive event diversity, it needs to be interpreted with caution as it emerged in only one of the three samples.

Concerning Extraversion, we did not find evidence for our hypothesis that people higher in Extraversion would experience lower positive event diversity. Although our data indicated that people higher in Extraversion reported more positive social interactions, they also reported more positive events across the other positive event types. Importantly, we do not know whether positive events in categories other than positive social interactions (such as work events, events at home, nature events, or other miscellaneous events) involved social interactions or if they happened in solitude. Future research would benefit from further investigating the role of Extraversion in socially-oriented positive events, including diversity in social contexts and interaction partners.

Similar to Extraversion and Openness, the remaining Big Five traits were not found to be predictors of positive event diversity or moderators of the relationship between positive event diversity and daily affective well-being. Significant patterns that emerged in single studies were not supported by our meta-analytical summaries. Although the Big Five personality traits did not predict positive event diversity nor moderate the link between positive event diversity and
affective well-being, it might be that lower-level traits such as Need for Novelty (González-Cutre et al., 2016) or specific facets of the Big Five instead of global traits could be more meaningfully related to positive event diversity.

4.4.2 Positive Event Diversity and Well-being

Contrary to our hypotheses, the potential well-being benefits of higher positive event diversity were fully explained by the overlap with positive event frequency. In fact, there appeared to be negative affective implications of having positive events spread across different positive event types, especially for people who experienced a high number of positive events. Experiencing frequent positive events of different types might represent role strain in balancing multiple—possibly competing—social roles and responsibilities. For example, a person who is going for a run in the morning, accomplishing an important goal at work, playing with their children at the park, and sharing the joy of their friend getting a new job has a high diversity and frequency of positive events, but each event presents a different social role (parent, employee, friend; Meter & Agronow, 1982). As our data provided limited information on social roles, we could not formally test this explanation and future work is needed to examine the interplay between social roles, role strain, and positive events. In particular, participants could indicate whether each reported event is related to one of their social roles, which would enable us to examine whether positive events differ in meaningful ways depending on the number of social roles that they are related to.

An important implication of our findings is that there may be no detriment to experiencing positive events that are similar to each other. For example, a person that often experiences positive events at work but not in other contexts would not have lower average positive affect, compared to a person with high diversity across their positive events. This does
not imply, however, that experiencing positive events in different contexts has no benefits. Having positive events in different life domains might foster feelings of social connection (Totenhagen et al., 2012), domain-specific self-esteem (Zeigler-Hill et al., 2010), or sharpen cognitive skills by forcing engagement with different environments (Hultsch et al., 1999; Logsdon & Teri, 1997; Siedlecki et al., 2009). Thus, future work should examine other potential benefits of positive event diversity that go beyond daily affective well-being.

4.4.3 **Strengths and limitations**

The current study should be viewed in light of its strengths and limitations. This is the first study, to the best of our knowledge, to examine the diversity of daily positive events and its well-being and personality correlates. We tested theory-grounded hypotheses in three large samples of adults. Besides being well-powered, these samples encompassed adults across a wide age range and captured daily life during different historical periods (e.g., mid-2000s for NSDE 2, post-Great Recession for NSDE Refresher, and COVID-19 pandemic).

We used established procedures to estimate positive event diversity, similar to procedures for stressor diversity outlined by Koffer and colleagues (2016). These procedures, however, are not without their limitations. During each nightly survey, people were only able to report one positive event per category. If multiple positive events were experienced in a given category on the same day, these events would not have been counted, potentially biasing the diversity index. Future research could use multiple assessments per day, the day reconstruction method (Kahneman et al., 2004), or other methods to obtain more precise assessments of daily positive events. Another limitation concerns the potential overlap of the positive event types. Although participants did not report difficulties choosing one of the categories for their positive events, in
some cases, events might have fit multiple categories (e.g., positive social interactions in nature). Future research could employ alternative metrics of positive event diversity, such as locations of events, the specific people that are present, or the novelty of events. Finally, poor internal consistencies for some of the personality measures might have attenuated relationships among variables. Brief instruments were used in the examined datasets to reduce participant burden. Lengthier measures that increase reliability and offer the opportunity to assess facets would have been preferable.

4.4.4 Conclusion

In the current study, we responded to calls to examine novel metrics that can provide insights into the diversity of daily life experiences (Benson et al., 2018). We specifically focused on the associations between diversity in daily positive events and personality traits and affective well-being. Contrary to expectations, we found little support for personality traits as predictors of positive event diversity, independent of the frequency of such events. This study demonstrates that event diversity should be viewed in the context of event frequency, as frequent events in different contexts may pose strain on individuals (Koffer et al., 2016).

Furthermore, positive event diversity is only one potential metric that can illuminate the range and variety of positive psychosocial experiences. Our results should be interpreted alongside other aspects of daily life diversity, such as emodiversity (Quoidbach et al., 2014), stressor diversity (Koffer et al., 2016), and activity diversity (Lee et al., 2018). Examining the diversity of environmental features such as positive events that can elicit responses in emotional, cognitive, and biological systems can provide a holistic assessment of both the abundance and the variety of features that exist in the ecosystem of daily life. This study can add to our
comprehensive understanding of the extent to which, and under what conditions, the range of experiences an individual encounters contributes to their well-being.
Chapter 5: General Discussion

5.1 Synthesis

Positive events are a central aspect of the ebbs and flows of daily life. In addition to providing a steady source of positive emotions, they can foster relationships, help cope with stress, and bolster self-esteem (Cohen & Hoberman, 1983; Sin & Almeida, 2018; Zeigler-Hill & Abraham, 2006). This dissertation included a series of three studies that tested pathways within a conceptual model that aims to understand the role of positive events in bolstering health and well-being (Figure 1.1). In particular, these studies examined which factors are linked to the frequency of positive events, emotional responses to these events, and how they are spread across different types of positive events using daily life data from three large adult lifespan samples in Canada and the U.S. Both age and personality traits were significant predictors of how often people experienced positive events and how they responded emotionally to these events. The insights from this research further our understanding of how people’s personalities and their lifespan developmental context shape the minor positive experiences that provide people with positive emotions as they go about their day-to-day lives.

Building on theoretical models of adult development, Study 1 examined age differences in daily events during the initial phase of the COVID-19 pandemic, a time of immense stress and uncertainty. Although older adults are physically more vulnerable to severe health complications upon contracting COVID-19, this age group nevertheless reported better well-being during the early months of the COVID-19 pandemic—a time that was characterized by stay-at-home restrictions and social distancing recommendations across Canada and the U.S. Despite older adults reporting more positive events across different event types (i.e., positive social interactions that occurred remotely or in-person, positive events in nature), younger adults
reported greater reductions in their negative affect when positive events occurred. These findings imply that positive events vary across the adult lifespan and that the events younger adults experienced may have been more potent in offsetting heightened negative emotions during a stressful life period.

Studies 2 and 3 took an individual differences approach by focusing on personality differences in daily positive events. Specifically, Study 2 highlighted Extraversion and Openness as the two central traits that may stimulate behaviours that lead to greater engagement in daily positive events. While these two traits seem most important for actively creating and seeking out positive events in daily life, potentially due to their connection with agency and proactivity, the other Big Five traits also showed distinct patterns of associations with specific emotions experienced during positive events. Taken together, these results suggest that the subjective experience of positive events in daily life may be shaped by one's personality dispositions.

Finally, Study 3 examined the novel construct of positive event diversity, that is, the extent to which positive events are spread across different event types or life domains. Contrary to the hypotheses, findings from three independent samples showed that positive event diversity was only weakly related to personality traits and well-being. More importantly, these associations could be explained by the overlap between positive event diversity and frequency. Furthermore, people who experienced a combination of high diversity and high frequency of positive events tended to experience higher levels of negative affect in daily life. These results suggest that a more nuanced view of the diversity of daily experiences is needed that takes into account the frequency of events, social roles, and personality traits. The findings of Studies 2 and 3 offer a novel perspective on the interplay between personality traits (especially Extraversion and Openness) and the environmental factors that influence our day-to-day emotional lives.
5.2 Positive events in context

Positive events do not happen in a vacuum; rather, it is essential to consider the various contexts and motives that underlie these events. For instance, people may create positive events with their romantic partner to bolster their relationship satisfaction or watch their favourite movie to forget about a conflict they had at work. Together, the present findings show that the lifespan developmental context and personality traits may provide important information to better interpret the rich context in which positive events emerge. For example, Study 1 found that younger and middle-aged adults had more positive events at work compared to older adults, and Study 2 showed that people high in Openness tended to experience more positive events that evoked feelings of surprise. Personality traits and the lifespan developmental context may shape the daily goals and needs (King et al., 1998) that underlie the occurrence and characteristics of daily positive events.

5.2.1 Age differences in positive event processes

Older adults report positive affective experiences frequently, often even more so than younger or middle-aged adults, despite well-documented cognitive and physical declines and social losses (Mather, 2012). While there have been lifespan developmental theories on motivation, attention, or coping to explain these age-related well-being benefits (Carstensen et al., 1999; Charles, 2010), positive event processes may be another component of daily life that contributes to older adults’ well-being. Given that better emotion regulation is often suggested as the driving force behind older adults’ favourable well-being (Isaacowitz, 2022), positive event engagement in daily life may be discussed in the context of emotion regulation.

Emotion regulation in daily life incorporates processes such as situation selection, appraisals, and response modulation (Gross, 2002). While the current and other research (Sin et
al., under review) has shown that older adults tend to report more daily positive events, it remains unclear whether these results are driven by older adults self-selecting themselves into more positive situations or whether they tend to appraise more situations as positive. Regarding situation selection, laboratory studies have not found age differences in the likelihood of selecting a positive over a negative situation (Sands et al., 2018); although one experience sampling study found that in daily life older adults tended to report positive situation selection more frequently as an emotion-regulation strategy (Livingstone & Isaacowitz, 2021). In the same study, however, older adults also reported greater use of positive reappraisal, which puts into question whether the present age effects in positive event engagement are driven by differences in situation selection, situation appraisal, or both. Future research designed to examine the different emotion regulatory processes that may drive positive event engagement in older adults is needed.

Differences in attention and memory may also help interpret the present results, such that older adults may be more likely to recall positive events when asked about them at the end of the day. The age-related positivity effect refers to an age-related trend that favours positive over negative stimuli in cognitive processing (Reed & Carstensen, 2012), which may affect to what extent people attend to positive cues in the situation or recall a situation as positive. Besides abundant evidence suggesting age effects in recalling positive stimuli in the lab (Reed et al., 2014), one experience sampling study found that the impact of a stressor on well-being decreased faster in older compared to younger adults (Scott et al., 2017). This suggests that given a greater time between an event occurrence and the psychological assessment, older adults may be more likely than younger adults to focus on the positive over the negative aspects of a
situation. Future work is needed that integrates age-related changes in selective attention and memory with the study of positive events.

The current thesis also investigated age differences in affective responses to positive events and found that positive events were related to greater same-day decreases in negative emotions in younger compared to older adults. Younger adults may have experienced positive events that are more potent in offsetting negative emotions in the face of COVID-19-related stress compared to older adults. Another explanation may be that older adults experience greater homeostasis, insofar that older age reduces responsivity to daily events and promotes affect stability. This is in line with past work that has shown that older adults fluctuate less in their affective experiences from moment to moment (Röcke et al., 2009) and show lower stress reactivity (Charles et al., 2009; Uchino et al., 2006). Examining whether older adults are more steadfast in their emotions and less perturbed by the daily positive and negative events that occur to them may be a fruitful avenue for future work.

5.2.2 Personality differences in positive event processes

Personality Science has long been concerned with questions about how personality differences manifest in daily life and through what daily processes personality differences contribute to longer-term health and well-being (Mischel & Shoda, 1994). More specifically, it has been proposed that personality could impact well-being by contributing to differences in either event exposure (e.g. event occurrence or frequency) or event responses (e.g. affective reactivity; Bolger & Zuckerman, 1995). With regards to this investigation on positive events, there was clear evidence that personality differences are related to the occurrence of daily positive events, but evidence was more mixed about personality being related to emotional responses to positive events. Given that effect sizes were small and effects inconsistent between
the two examined samples, findings on positive event-related affect cannot be taken as strong evidence for personality driving overall affective responses to positive events. However, each of the Big Five personality traits mapped onto at least one of the assessed distinct emotions that people reported experiencing during their positive events. These results dovetail with a more recent drive in affective science to move away from examining global positive and negative feelings and to focus more on distinct emotions (e.g. calmness or excitement) and their specific consequences (Hamm et al., 2021).

The current investigation also considered the complexity of daily events (i.e. positive event diversity) as an additional way through which personality may contribute to psychological well-being. Despite good theoretical bases for the tested hypotheses, positive event diversity did not have utility in explaining well-being differences in daily life over and above the effects of positive event engagement. These results differ from a previous study that has shown that daily life complexity may have utility in explaining the link between personality and better cognitive functioning (Jackson et al., 2020). Therefore, future research that examines to what extent other aspects of daily life complexity (e.g. stressor diversity) and their health- and well-being correlates are linked to personality traits is warranted.

The present studies focused on the Big Five personality traits as they offer a useful and widely understood metric to compare people on the major dimensions of personality. Given that the Big Five are fairly global traits and only offer a coarse classification of the ways people differ in their behavioural, emotional, and cognitive tendencies, a focus on lower-level trait-like constructs, such as Purpose in Life or Optimism, may stimulate further advances in the personality positive event link. Purpose in Life, for example, can be defined as a commitment to a clear set of goals that lead to the sense that life is meaningful (Pfund & Hill, 2018) and has
both stable trait-like as well as fluctuating state-like components (Hill et al., 2021). Past research has shown that people with a higher sense of purpose engage in positive events more frequently but also respond with less positive affect when these events occur, potentially due to greater affect stability in purposeful individuals (Hill et al., 2021, 2022). Further research is needed, however, to examine to what extent people feel more purposeful in response to positive events and whether these within-person fluctuations in purpose may accumulate to longer-term changes in levels of trait purpose. Similarly, it would be interesting to study whether Optimism, people’s sense of confidence about life outcomes (Bouchard et al., 2017), is linked to both expecting and experiencing more positive events, and whether, in turn experiencing more positive events may instill a sense of Optimism in people. Thus, taking an approach that considers positive events as a way of personality differences manifesting in daily life but also potentially fostering within-person changes in trait-like constructs, is likely needed to understand the interplay between personality and positive events.

5.2.3 Positive events in the context of stress

Stress is another important context that needs to be considered when examining daily positive events. Prominent stress theories suggest that positive experiences—such as positive emotions or positive events—can protect individuals during times of stress through the accumulation of resources (Fredrickson, 1998; Hobfoll, 1989; Pressman & Cohen, 2005), offsetting negative emotions (Fredrickson et al., 2000; Zautra et al., 2005), as well as sustaining coping efforts (Folkman & Moskowitz, 2000). While the stress-buffering effects of positive emotions have been shown in the laboratory (Aschbacher et al., 2012; Steptoe et al., 2005) and in daily life (Ong et al., 2004, 2006), positive emotions are not context-independent.
This dissertation expanded on past work by focusing on the events that elicit positive emotions. Given that positive events tend to occur alongside stressors (Folkman et al., 1997; Sin et al., 2017; Zautra et al., 2005), it is possible that people intentionally seek out positive events as a way of coping with stress (Folkman & Moskowitz, 2000). This is evident in the high number of daily positive events and stressors reported in the COVID-19 sample (see Studies 1 and 3), which was collected during a time that was characterized by high stress, uncertainty, and restrictions on in-person social interactions. Positive events (e.g., spending time in nature, phone calls to catch up with friends) were likely sought out by individuals as their regular daily routines came to a halt. Interestingly, daily fluctuations in both positive and negative affect were more closely linked to the occurrence of positive events in the COVID-19 sample compared to both NSDE samples, suggesting that positive events might be more central to the affective lives of individuals during times of increased stress.

Formally testing whether positive events can buffer the impact of daily stressors was outside the scope of this dissertation but will be integral to future work on the role of positive events in daily life. Past work has shown that naturally occurring positive work events are predictive of decreases in work-related stress (Bono et al., 2013) and at the within-person level, there was evidence that on days with more positive events, people showed lower affective reactivity to daily negative events such as stressors (Longua et al., 2009; Nezlek & Allen, 2006), interpersonal conflicts (Finan et al., 2010) and experiences of discrimination (Ong et al., 2022). None of these studies, however, has paid attention to whether these events are been actively sought out as a way of coping with negative same-day experiences. Examining the characteristics of positive events that people actively utilize to counteract daily stress will be important for better understanding the unique role that positive events can play in the context of stress.
5.3 Strengths, limitations, and future directions

5.3.1 Capturing life as it is lived

In this dissertation, I took a daily life approach by utilizing data from three large daily diary samples to examine daily experiences in near real-time. This approach has multiple advantages. First, asking people about their experiences, thoughts, and feelings on the day they occurred can drastically reduce recall biases compared to global judgments reported on single-administration surveys (Smyth et al., 2017). Second, an advantage of micro-longitudinal data is the ability to consider within-person covariation on a daily level. Examining event-related affect as a proxy for affective responses to positive events is only possible if we can compare people’s emotions during days when a positive event occurred vs. days when no positive event occurred. Given that this dissertation relied on daily diary data, one may ask whether changes in affect evoked by a minor positive event in the morning would be accurately captured by an evening assessment. It might be that other more salient events of that day overshadow the impact of earlier positive events. Thus, future research on daily positive events could employ repeated assessments across the day (e.g. Scott et al., 2015). Such studies will be important to disentangle the timing and ordering of relationships, such as whether higher levels of positive affect make it more likely for positive events to occur and how long changes in positive affect linger following a positive event.

5.3.2 The problem of data overuse in research on positive events

As described in the introduction, the inclusion of a positive event measure in the NSDE studies proliferated investigations into the roles of daily positive events across the lifespan. However, using the same dataset in multiple investigations of a construct can give rise to problems that are associated with data overuse, such as creating dependencies among published
findings or amplifying sample peculiarities and inherent biases (Mroczek et al., 2022). Both Studies 2 and 3 relied on data from NSDE, as did other studies that examined the health and well-being correlates of daily positive events (e.g. Gunaydin et al., 2016; Sin et al., 2015; Sin, Ong, et al., 2017). To address some of the issues associated with data overuse, I compared results from up to three independent samples in Study 3 to ensure that the conclusions were not based on biases inherent to a specific overused sample. Furthermore, the analyses in Study 3 were preregistered to enhance replicability and to adhere to the highest standards of scientific rigor. In line with standards for greater transparency in the analysis of pre-existing datasets (Weston et al., 2019), I have made the data analytical code for Studies 2 and 3 available on the Open Science Framework. However, it will be integral for future inquiries into the role of daily positive events to collect more unique data from diverse samples to instill greater confidence in research findings.

5.3.3 The use of community samples

The present research program utilized daily diary data from three different community samples collected over the last 20 years. These samples had wide age ranges (18-91 years old) and represented people from different backgrounds located all over the U.S. and Canada. Conscious efforts were made to improve the diversity of the samples. For example, NSDE included a large subsample of African American participants from Milwaukee to increase racial diversity (Ryff et al., 2018). Nevertheless, it should be noted that participants in NSDE and MIDUS are less racially diverse and more educated compared to the population average (Almeida et al., 2002).

With regards to the COVID-19 study, to recruit a large number of people to study daily life during the onset of a newly emerging global pandemic, our recruitment strategy relied
heavily on newspaper coverage and existing community contacts. This resulted in a sample that was predominantly white, women, and well-educated, which limits the generalizability of the findings. This is, however, a widespread problem in psychological research. Volunteer participants tend to be more educated and healthier compared to the general population, and this gap may increase when examining older adults (Golomb et al., 2012). Thus, future research needs to recruit harder-to-reach populations, especially among older adults that may not be well connected with social media or community groups.

In addition to studying representative groups of community-dwelling adults, there may be value in examining positive event processes in specific populations which can provide important contextual information and foster the understanding of the meaning and function of positive events for specific groups of individuals. For example, past research has shown that individuals with major depression tend to show more pronounced increases in positive emotions in response to positive events, compared to non-depressed individuals (Bylsma et al., 2011; Heininga et al., 2017; Peeters et al., 2003). Importantly, positive events are able to offset negative affect in individuals with depression, whereas non-depressed individuals show smaller to no changes in negative affect when positive events occur (Peeters et al., 2003). This suggests that positive events may take on a different function for people with psychological distress, such as major depression. Examining the role of positive events in people coping with other mental and physical health conditions might be a fruitful avenue for future research. For example, among adults living with chronic pain, positive events may have the potential to offset pain symptoms and psychological distress, possibly mediated through positive affect (Ong et al., 2020; Zautra et al., 2001).
5.3.4 Correlation vs causation

A notable limitation across the three studies in this dissertation is that the findings are correlational and cannot address causal mechanisms. Thus, it is unknown whether positive events lead to increases in positive emotions, whether higher positive emotions cause people to engage in more positive events, or whether both positive emotions and positive events are driven by third variables (e.g., better sleep leads to both positive events and positive affect). Most experimental designs are not well-suited for examining naturalistic daily positive events, yet future work may utilize causal inference techniques for observational data (Rohrer, 2018) to get a better sense of the potential causal relationships among different aspects of positive events.

Some past work, however, has used naturalistic field experiments to provide evidence for a causal effect of positive activities on a range of well-being outcomes (Lyubomirsky & Layous, 2013). In these studies, people are instructed to engage in specific positive activities such as writing a letter of gratitude, practicing acts of kindness or meditation throughout their daily lives. Future work may utilize an experience sampling approach within naturalistic field experiments to provide insights into whether people respond similarly to experimentally induced versus naturally occurring positive events. For example, people could be randomly instructed to engage in a positive event of their choice on randomly chosen days while on the remaining days people would be asked to live their lives as they normally would. In addition, combining observational and experimental methods can provide more clarity on the underlying causal relationships between positive events and health-related outcomes.

5.3.5Overlap of different daily processes

Positive events and stressors may not always be separate events but are often intertwined. Stressful events can turn into positive events, positive events into stressful ones, or they may be
two different sides of the same event. To illustrate this phenomenon, some participants in the COVID-19 study provided a more detailed description of days on which they reported both a stressor and a positive event. For example, one participant wrote about taking a walk (positive event) but then getting into a conflict with two joggers who were not socially distancing (stressor). Another participant wrote about how the joys and challenges of caregiving are linked to each other. Thus, one major challenge in daily life research is to disentangle the effects of intertwined daily processes.

When examining positive events, one potential issue is that these events may be overlapping with leisure activities or social support transactions. Thus, it is important to examine whether positive events may provide unique insights beyond research focused on these experiences. Importantly, some distinctions between positive events and these different experiences can be drawn. Not all transactions of social support and all leisure activities are appraised positively, which distinguishes positive events from other experiences (Sin & Almeida, 2018; Zautra et al., 1986). For example, negative aspects of social support have been documented in several past studies (Croezen et al., 2010; Lee et al., 2019; Oxman & Hull, 1997). Leisure activities—such as playing recreational sports or taking a woodworking class—are often planned in advance and depend on the person having enough time and resources (e.g., finances, facilities, equipment) to carry them out; whereas positive events can occur spontaneously and across different contexts (not only during leisure time) and can be as mundane as sharing a good laugh with a coworker.

These examples highlight that daily life researchers need to consider overlapping constructs and processes. While there is value in focusing on specific parts of daily life such as spousal interactions (Pow et al., 2018), a unified model to describe the different characteristics of
diverse daily events and experiences (e.g. stressors, experiences of discrimination, interpersonal conflicts, positive events, social support, volunteering, leisure activities) may be instrumental in advancing the field of daily experiences. Such a model could draw from existing models of situational characteristics developed to study person x situation interactions (Rauthmann et al., 2014; Wagerman & Funder, 2009), and may serve to avoid issues such as concept creep, overlapping studies, and allow better communication between researchers interested in the dynamics of daily life.

5.4 Conclusion

The ups and downs of daily life commonly include frequent experiences of positive events. These events may serve as a pathway through which the lifespan developmental context and personality traits impact daily emotional experiences. I proposed a conceptual model that integrates daily positive event processes and health-related outcomes within social, psychological, and environmental factors. Three studies were conducted that focused on positive event engagement, responses to positive events, and positive event diversity. Older age was related to greater engagement in positive events, despite younger adults showing greater responsiveness to positive events in terms of reduced negative affect when positive events occurred. Personality traits, particularly Extraversion and Openness were related to greater engagement in positive events, but personality did not predict the diversity of positive events over and above the links with positive event engagement. Concerning responsiveness, each of the Big Five factors had different correlates of specific emotions that people felt during positive events.

This set of studies contributes to but also poses questions about age differences in emotional processes and how personality might influence the situations that people select.
themselves into. Taken together this research informs a more nuanced understanding of how our personality traits and our lifespan developmental context is related to the way we interact with our environment in the context of positive experiences. This work has also the potential to inform interventions that target daily positive events. Integrating knowledge about what types of positive events people engage in or how they respond to them at different points of the lifespan may provide important contextual information when designing such interventions.
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