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Daily Events Are Important for Age Differences in Mean and Duration for Negative Affect but Not Positive Affect

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Across midlife and into old age, older adults often report lower levels of negative affect and similar if not higher levels of positive affect than relatively younger adults. Researchers have offered a simple explanation for this result: Age is related to reductions in stressors and increases in pleasurable activities that result in higher levels of well-being. The current study examines subjective reports of emotional experience assessed across 8 days in a large sample of adults (N = 2,022) ranging from 35 to 84 years old. By modeling age differences before and after adjusting for daily positive uplifts and negative stressors, this article assesses the extent to which daily events account for age differences in positive and negative affect reports. Consistent with previous research, the authors found that older age is related to lower mean levels and shorter duration of a negative emotional experience in a model only adjusting for gender, education, and ethnicity. After adjusting for daily events, however, the linear age-related effects were no longer significant. For positive affect, adjusting for daily events did not alter age-related patterns of experiencing higher mean levels and longer positive experience duration, suggesting that other factors underlie age-related increases in positive affect.

Keywords: life span development, well-being, emotion and aging, positive and negative affect

Older adults frequently report higher levels of positive and lower levels of negative affect than younger adults (e.g., Stone, Schwartz, Broderick, & Deaton, 2010). *Positive affect* refers to the subjective reports of overall positive experience, usually comprised by averaging the experience of several positive emotion states, such as feelings of joy, happiness, and contentment. *Negative affect*, in contrast, refers to the subjective reports of a combination of negative emotion states, such as feelings of anger, sadness, and nervousness. Even in later life, when social and health-related losses are more common, affective well-being remains relatively spared. For example, a large meta-analysis examining adults aged 50 and older found that positive affect remained stable from ages 50 to 60, and only showed age-related declines among the oldest adults (Pinquart, 2001). Similarly, negative affect decreased slightly (correlation of −.05) with age across midlife but showed a small age-related increase (correlation of .02) among the oldest old. Notably, when researchers have observed lower affective well-being in very old age, such as decreases in life satisfaction (Mroczek & Spiro, 2005), levels for the oldest old are still higher than those observed for younger adults. Researchers have explained decreases in well-being in late life as a process related to dying, or the terminal drop, and not of aging, per se (e.g., Gerstorf, Ram, Röcke, Lindenberger, & Smith, 2008). The overall trends of increasing well-being across adulthood to age 65 years and sometimes into late life have led researchers to refer to this phenomenon as a "paradox of aging" (e.g., Mather, 2012).

Researchers have discussed possible reasons for these small but reliable age differences in positive and negative affect (see review by Charles & Carstensen, 2010). For example, findings from laboratory studies suggest that old age is related to more benign appraisals of negative stimuli; a bias toward remembering positive over negative events; and an increased ability to navigate difficult situations. A more parsimonious explanation for age differences in daily positive and negative affect is that older adults experience fewer events in their lives that give rise to negative emotion states (e.g., Lawton, 2001). In addition, they have more leisure time to engage in more positive experiences, an explanation that has long been offered in the literature (e.g., Ginn & Fast, 2006). Others suggest, however, that a decreased engagement in activities may lead to decreases in positive affect (Pinquart, 2001). The current study is the first to examine whether the context of daily life—

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both the occurrence of and reactivity to positive and negative daily events—is sufficient to account for age differences in daily positive and negative affect across a sample representing most of the adult life span.

Explaining Patterns of Well-Being and Aging

An emerging literature finds that older age is often associated with more positive and less negative reports of emotional experience in daily life (see review by Charles & Carstensen, 2010). Recent studies have included participants predominantly from North America or Western Europe and find that reports of emotion states such as anger often are lowest among the oldest adults (see review by Steptoe, Deaton & Stone, 2015). In contrast, self-reported life satisfaction or overall happiness are often highest among those in their sixties or early seventies (e.g., Steptoe et al., 2015; Stone et al., 2010).

Researchers have suggested that age differences in the use of emotion regulation strategies may explain these affective profiles. These strategies include age differences in how people attend away from negative stimuli and toward positive stimuli (e.g., Isaacowitz, Wadlinger, Goren, & Wilson, 2006); appraise negative stimuli more benignly (e.g., Luong & Charles, 2014); and remember emotional experiences as less negative and sometimes more positive (e.g., Reed, Chan, & Mikels, 2014). In laboratory studies of emotion regulation, older adults are often better at using positive reappraisal to modulate their affective response to negative films (Shiota & Levenson, 2009). In addition, researchers find that older age is related to greater tendencies to down-regulate negative affect when having a disagreement with either a spouse (Carstensen, Gottman, & Levenson, 1995) or other social partners (Sorkin & Rook, 2006). Laboratory studies suggest that older age is often related to greater or more efficient use of emotion regulation strategies (e.g., Scheibe & Blanchard-Fields, 2009), yet these studies do not offer direct evidence that these behaviors are responsible for the lower levels of negative affect and higher positive affect frequently observed in the literature (e.g., Isaacowitz & Blanchard-Fields, 2012).

A more parsimonious explanation for these findings may simply result from different daily life experiences. Socioemotional selectivity theory posits that older adults are more likely to structure their daily lives to satisfy emotion-related goals than are younger adults (Carstensen, Isaacowitz, & Charles, 1999). As a result, older adults make decisions in their daily lives that serve emotional goals, such as selecting social partners who provide them emotionally meaningful and more positive experiences, to a greater extent than do younger adults. Other researchers discuss how lives become more predictable and stable with age, which also decreases the likelihood of stressors (e.g., Lawton, 2001). Older adults often report fewer daily stressors than younger adults (e.g., Almeida & Horn, 2004; Brose, Scheibe, & Schmiedek, 2013; but see Scott, Sliwinski, & Blanchard-Fields, 2013). In addition, one study found that age-related decreases in number of daily stressors partially explained why older adults exhibited less negative affect variability (i.e., the degree to which the mean of negative affect varied from one day to the next across multiple days), and reported that stressors were less disruptive to their daily routines (Brose et al., 2013). This contextual explanation for age differences in affective experience is bolstered by research showing that among older adults, exposure to daily stressors accounts for age differences in negative affect when comparing a sample of women spanning from 63 to over 90 years old (Charles et al., 2010).

Strength and vulnerability integration (SAVI) is a theoretical model that states that age-related decreases in negative affect are largely the result of older adults avoiding situations of distress (Charles, 2010). SAVI incorporates socioemotional selectivity theory to explain why older age is related to a greater motivation to avoid negative situations. In addition, life experience presumably provides older adults with information about situations that particularly bother them so they can more easily avoid those situations. According to SAVI, the often-observed trend of lower negative affect with age reflects the decreased exposure to unpleasant events. Although SAVI has focused on avoidance of unpleasant experiences—and therefore decreased exposure to distressing events and decreased negative affect—it is reasonable to assume that this reduced exposure to unpleasant activities may also lead to increases in positive affect, as well.

Measurement of Affect

Most studies examining age differences in affective experiences focus on mean levels of affect. A small but growing number of studies are providing a more nuanced view of emotional experience, examining such aspects as the duration of affective experience; how reports of specific emotions fluctuate from day to day; and how these reports are influenced by daily events (e.g., Hay & Diehl, 2011; Houben, Van Den Noortgate, & Kuppens, 2015; Röcke & Brose, 2015). These aspects are important, as indicated by the broader emotion literature.

The duration of emotion states, which can span many hours, is often excluded in empirical analyses of daily affective experiences (see review by Verduyn, Delaveau, Rotgé, Fossati, & Van Mechelen, 2015). Yet, this concept has been discussed for years in theories of emotion and emotion regulation (Frijda, Mesquita, Sonnemans, & van Goozen, 1991). In the clinical literature, for example, the duration of emotion states across the course of the day is used for diagnostic purposes; for example, people are asked to recall whether they have felt sad or irritable for most or all of the day across a two week period for the diagnosis of a depressive disorder (e.g., Kessler et al., 1994). More recently in the nonclinical literature, researchers have assessed self-reports of the daily duration of specific emotions using daily diary methodology (Verduyn, Delvaux, Van Coillie, Tuerlinckx, & Van Mechelen, 2009). They found that the daily duration of an emotion state correlates positively with the intensity of the experience and with different regulation strategies; for example, adopting a self-distancing perspective as opposed to a self-immersive perspective reduces the duration of negative emotion states (Verduyn, Van Mechelen, Kross, Chezzi, & Van Bever, 2012). Alternatively, the ability to extend the duration of positive emotion states (i.e., savoring) is a hallmark of many studies examining happiness (e.g., Feldman, Joormann, & Johnson, 2008).

In the emotion and aging literature, early conjecture about the duration of negative affective states was based on the disengagement theory and assumed that older age was accompanied by a tendency to quickly disengage from all emotional experiences (Dean, 1962). New theories, however, posit that older adults will experience shorter negative affective states but longer positive

ones in displays characteristic of increased emotion regulation ability (e.g., Scheibe & Carstensen, 2010). One momentary sampling study, for example, found that older age was related to shorter duration for reports of negative emotion states and longer duration of positive emotion states (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000). In another study where younger, middle-aged, and older adults were asked about emotion duration by questions such as, "Once I'm worried or blue, that feeling seems to last," successively older adults reported shorter duration of negative affect and longer duration of positive affect (Lawton, Kleban, Rajagopal, & Dean, 1992). In a recent momentary sampling study, older age was related to a faster return to baseline levels of positive affect (i.e., shorter duration of positive affect disruption) but was unrelated to speed of recovery for negative affect (Scott et al., 2013).

In the current study, we were interested in whether age differences existed for the amount of time people report an enduring negative or positive affective state. Similar to studies that examine self-reports of overall means' levels and not of specific emotions, we were interested in the longest duration that someone reported a negative and a positive emotion irrespective of the specific emotion in question. One potential interpretation of duration is that longer duration reflects a failure to regulate out of a negative mood (negative emotion states, e.g., Carstensen et al., 2000), and a success for continuing to experience high level of positive emotions (i.e., savoring) for continuous positive emotion states (e.g., Feldman et al., 2008).

In addition to mean levels and durations of affective states, researchers also examine the variability of negative and positive emotional experiences. The measure of variability most often included in the literature assesses how overall mean levels of emotional experience vary from day to day across the course of a week or month, captured in daily diary or momentary sampling studies (Röcke, Li, & Smith, 2009; see review by Röcke & Brose, 2015). Several studies have found that older age is related to lower levels of variability of both positive and negative affect, such that older adults show more stability in their emotions from day to day (e.g., Brose et al., 2013; Röcke et al., 2009). These studies have compared younger people in their 20s to older adults aged 65 and older. It is unclear whether people in their 30s, 40s, and 50s, who commonly experience both work and family caregiving demands, will follow similar patterns. This age group of adults is particularly important to examine, given U-shaped patterns observed in some studies of affective phenomena (e.g., life satisfaction; Mroczek & Spiro, 2005).

The Current Study

The current study examines age differences in aspects of positive and negative affect collected across eight consecutive days among participants ranging from 35 to 84 years-old. This study expands on previous findings (Brose et al., 2013; Charles et al., 2010) by including a larger sample of men and women that include those in midlife; by including both the occurrence of positive and negative daily experience and reactivity to these experiences in the models; and by examining different aspects of both positive and negative affect (mean levels, and longest duration; and the variability across 8 days for both of these constructs). The sample, comprising participants from the second wave of the Midlife in the United States Study (MIDUS II) daily dairy study (NSDE II), provides a large group of adults spanning over 50 years of adulthood (from age 34 to 85) who reported their positive and negative experiences every day across eight consecutive days. Based on prior cross-sectional findings (e.g., Mroczek & Kolarz, 1998) as well as predictions from SAVI, we predict that older age will be related to lower levels of negative affect and we will examine how age-related differences extend to predict higher levels of positive affect as well. Based on the few findings examining duration of negative and positive affect (e.g., Carstensen et al., 2000), we hypothesize that older age will be related to shorter negative and longer positive affect durations. We also examine age differences in variability of mean levels throughout the week. Given that emotions are responsive to daily events, and that older age is often related to fewer stressors and similar levels of uplifts as discussed in SAVI, we predict that the pattern of age differences for negative emotional experience will be attenuated once daily life context is included in statistical models. We further examine the effects of adjusting for daily life events on the pattern of positive emotional experiences across age.

Method

Participants

Participants in the current study (N = 2,022) consisted of a subgroup of the second wave of the Midlife in the United States (MIDUS) longitudinal study. The first wave of this study included over 7,000 American adults ranging from 25 to 74 years old who completed two extensive questionnaires (one administered over the phone and the other by mail) between 1994 and 1995. From these participants, 1,483 men and women also participated in the National Study of Daily Events (NSDE I), a daily diary study where people were telephoned and asked about the events of their day across eight consecutive days (for a complete description of the methods and the sample, see Almeida, McGonagle, & King, 2009; Almeida, Wethington, & Kessler, 2002). NSDE I participants were predominantly European American (90%) with a minority African American (6%) and the remaining who either declined to state or were another ethnicity. Participants averaged 47.3 years of age (SD = 13.2) and were slightly more likely to be female (54%), with the majority having at least a high school degree or the equivalent (66%). This data collection did not ask about daily positive uplifts or positive emotions, and thus these data were not included in the current analyses.

Approximately 10 years later, 793 of the original NSDE I participated in MIDUS II and NSDE II study, yielding a 53.4% retention rate. Attrition occurred through refusal (53%), loss of contact (30%), deceased (13%), or no longer eligible (4%). New participants (n = 1,229) increased the total sample at the second data collection wave to 2,022 and included 180 African Americans to compensate for the low minority representation. These participants (N = 2,022) averaged 56 years old (35–84 years old) and 57% (n = 1,154) were women. Like the original sample, individuals were primarily Caucasian (86.4%) and had a high school degree or more education (69.2%). Together, they participated in 14,912 of a total possible 16,176 daily telephone interviews (92%). The current analyses included all people who participated in this second wave of data collection. The larger MIDUS II sample and

the NSDE II sample are similar in mean age (MIDUS = 55.43; NSDE = 56.24). MIDUS II includes a smaller percentage of women (53%) than NSDE (57%) but roughly the same percent of Caucasian participants (about 90% for both samples). MIDUS participants are slightly less educated (25.5% high school; 37% with college degree or higher) than NSDE (24% high school; 40% with a college degree or higher).

Measures

Daily affect. Each day participants reported how much of the time they experienced a series of 13 positive and 14 negative emotions or emotion states on a scale of 0 (*none of the time*) to 4 (*all of the time*). These emotions parallel those used in MIDUS II in their 30-day measure of positive and negative affect. This composite scale of affect was the result of developing a scale (in MIDUS I) that included questions from the Affect Balance Scale (Bradburn, 1969), the University of Michigan's Composite International Diagnostic Interview (Kessler et al., 1994), the Manifest Anxiety Scale (Taylor, 1953), the Health Opinion Survey (MacMillan, 1957), the General Well-Being Schedule (Fazio, 1977), and the Center for Epidemiological Studies Depression Scale (Radloff, 1977). In MIDUS II, emotions from the Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988) were added to include a greater number of low arousal positive emotional states as well as more negative states. In NSDE II, these questions were asked about emotion experienced in the past 24 hr as opposed to the last 30 days.

Positive affect items included feeling cheerful, in good spirits, extremely happy, calm and peaceful, satisfied, full of life, enthusiastic, attentive, proud, active, close to others, like you belong, and confident (α = .96 based on reliability calculations recommended by Raudenbush, Rowan, & Kang, 1991). Negative affect items included feeling worthless, so sad nothing could cheer you up, nervous, restless or fidgety, hopeless, that everything was an effort, worthless, afraid, jittery, irritable, ashamed, upset, lonely, angry, and frustrated (α = .91). These emotional reports were used in calculating our main variables of interest.

Mean levels of affect. Mean duration of positive and negative affect were computed separately for each day. Reports of the positive affect items were averaged together for each of the eight days as were the negative affect items, resulting in a total possible of eight positive and eight negative mean-level affect values for each participant.

Longest duration of affect. For each day, we recorded the value of the longest reported emotional experience separately for positive and negative affect. For example, if "loneliness" was reported as being experienced as a 3 (*most of the time*) on a scale of 0 to 4 during the day and the other negative affect items were reported as being experienced as a 2 or less (*some of the time*), the value for the duration of negative affect for that day would be three. Then, the highest value within each affect was selected each day as indicating the longest duration. This yielded eight negative and eight positive emotion duration scores for each participant across the eight day diary. We used this strategy because we were interested in how long a person experienced a consistent negative or positive state, as opposed to an average, which is what the mean score assesses.

Daily stressors and uplifts. Each day of the diary study, participants answered seven questions asking about the occurrence of negative events (stressors), and five questions asking about the occurrence of positive events (uplifts) that might have happened during the past day. The seven stressors included an argument, a potential argument that was avoided, issues at work, issues at home, discrimination, someone in their social network experiencing a stressor, and any other potentially stressful event. For further description of this protocol, refer to Almeida et al. (2002). The five uplifts included a positive interaction with another person, a positive experience while at work or volunteering, a positive experience at home, something positive happening to someone in their social network, or any other positive event (Sin, Graham-Engeland, & Almeida, 2015).

The occurrence of either a negative stressor (coded as a 0 or 1) or a positive uplift (coded as either a 0 or 1) was included for each day to adjust for reactivity to these stressors (a within-subject source of variation) as well as the average number of stressor days and the average number of days with positive uplifts for each person (a between-subjects variation to indicate differences in overall exposure).

Analytic Strategy

We tested our questions using multivariate multilevel models to avoid aggregating across the eight day interval and simultaneously model information for all eight days for the mean and longest duration for positive and negative affect. We used the mixed procedure in SAS version 9.3 (SAS Institute, Cary, NC) as we have in previous analyses (Charles, Piazza, Mogle, Sliwinski, & Almeida, 2013). Multivariate multilevel models enable us to incorporate this nested data structure (i.e., eight days within persons) and allow us to examine all four aspects of emotional experience in one model. This process is an extension of the traditional multilevel model to a multivariate framework (Mehta & Neale, 2005; Snijders & Bosker, 1999). In this approach, the effects of predictors are examined while also explicitly modeling the intercorrelations among dependent variables. Parameter estimates are interpreted in the same way as in traditional multilevel modeling (and regression) where a one unit change in the predictor results in a *b* unit change in the outcome. *b* represents the estimated regression coefficient specific to one of the outcomes. For the technical details of implementing these models, we recommend Hoffman (2015; Chapter 9). The multivariate approach enabled us to simultaneously examine age differences in each of the four measures to explicitly model the intercorrelations of the mean and longest duration for positive and negative affect within and across persons and provide the strictest test of our hypotheses while limiting Type I error. Models also included age heterogeneous variances for all of the outcome variables based on previous work indicating that the variance in average levels of emotion decreases with age (Röcke & Brose, 2015).

Two main models were computed. In these models, age was grand mean-centered, such that a score of 0 corresponded to a person who is 56 years old. The first model examined age differences (entering the linear and quadratic terms for continuous age) for the variables of interest (mean and longest duration for positive and negative affect separately) while adjusting only for sociodemographic variables including gender, education, and ethnicity. In

the second model, we added the events of daily life. We included the occurrence of daily positive uplifts and daily negative stressors for each day (coded as having occurred or not with a 1 or 0 separately for positive and negative events). In addition, we included the average number of positive and negative event days that each person experienced. By including both factors, we had between- and within-assessments of these daily events, which provided adjustment for the daily effects of these events as well as how outcomes vary based on differences in person-level exposure to these events. Random effects were included at the person level that allowed a unique intercept for each outcome for every person. As with age, all between-person effects were grand mean-centered to aid in interpretation.

For both models, we ran the analysis with just a linear age term (age) and another with the addition of the quadratic term (age^2). The linear age effect did not vary in terms of significance across the two models (i.e., the nonsignificant age estimate in some of the models including the quadratic term was also not significant in models including only the linear age effect). For this reason, we only present the full model with the quadratic term included for both models.

For all models, we computed a pseudo-R^2 consistent with the procedures recommended by Singer and Willett (2003) which compares the difference in variance from the reduced model (without between- and within-person event variables) to the full model (with these variables) divided by the variance from the reduced model. This allows us to quantify the amount of variance explained in a given outcome by including these additional variables. Pseudo-R^2s are calculated for both between-person variance components as well as within-person components.

Results

During the entire week, participants experienced an average of 3.57 stressors (SD = 2.97) and 7.83 uplifts (SD = 4.57). At least one stressor was experienced on 37% of study days, and on 70% of days participants reported experiencing at least one positive uplift. Age was negatively related to experiencing stressors during the week, $r = -.237$, $p < .001$, but age was not significantly related to the number of uplifts experienced.

Table 1 displays the descriptive statistics for the outcomes, including the within- and between-person standard deviations and correlations. Mean, between-person standard deviation, and minimum and maximum values were computed using person averages; that is, we took the mean for each person across the 8 days and then computed descriptives on the person-averaged data. Within-person standard deviations were extracted from empty models decomposing the variation in each outcome into between- and within-components. In these models, the square root of the residual (the within-person variance) is an estimate of the within-person standard deviation. Although average negative affect was slightly skewed using the recommended cut-off of an absolute value of 2, removing extreme values (n = 116 of 54,714, 0.2% of available observations) did not impact conclusions from multilevel models. We therefore used all available data in models. Between-person correlations appear above the diagonal and within-person correlations appear below the diagonal. For individuals, average levels of affect were strongly correlated with duration levels of affect regardless of affect type (rs = .80 and .87 for positive and negative affect, respectively). Across individuals, higher average and longer duration of positive affect were negatively correlated with all of the negative affect parameters. Within-persons and across days, all of the negative affect parameters were significantly positively correlated; on days when an individual's average negative affect was higher, they also tended to have higher duration of negative affect. The within-person correlations also indicated that on days when average positive affect was higher, duration of positive affect was higher. With respect to the intercorrelations of positive and negative affect, on days when the average and the duration of positive were higher, the average and duration of negative affect was lower on those days.

Multivariate Multilevel Models

Results of the multivariate multilevel models that test our predictions appear in Tables 2 and 3. Outcomes were analyzed simultaneously but are discussed separately for clarity.

Negative affect. In the first model, older (compared with younger) age, Caucasian (compared with non-Caucasian), and males (compared with females) were related to having lower mean level and duration of negative affect. These linear effects were qualified by quadratic effects that were marginally significant for mean negative affect ($p = .0529$), and statistically significant for duration ($p < .001$). For mean negative affect, results indicated that successively older adults reported lower levels from age 35 until around age 60. At this time, levels were flat, but then began to increase slightly starting among people who were 65 years old. After the daily event predictors were added in Model 2, the significant main effects of age and gender were no longer significant.

For longest duration negative affect, older age was related to shorter duration when comparing people aged 35 to successively older adults until around age 70. At this point, negative affect duration started to reveal slightly higher values. The estimates for those at the oldest ages, however, never reached the values predicted for the youngest adults in this sample. When events were entered into the model, the linear effect was not significant but a significant quadratic effect remained. In addition, both between-person and within-person stressful events predicted higher levels

Table 1
Descriptive Statistics and Correlations

Variables	PA *M*	PA Dur	NA *M*	NA Dur
PA *M*	—	.803	−.454	−.442
PA Dur	.483	—	−.375	−.309
NA *M*	−.363	−.144	—	.820
NA Dur	−.305	−.098	.651	—
NA Diff	−.290	−.079	.770	.769
M	2.719	3.442	.209	.959
WP *SD*	.393	.421	.225	.780
BP *SD*	.695	.488	.248	.707
Min	.044	.500	.000	.000
Max	4.000	4.000	2.536	4.000
Skew	−.659	−1.158	3.271	1.551
Kurtosis	.487	2.396	14.857	2.764

Note. PA = positive affect; NA = negative affect; Dur = duration; Diff = differences. Correlations above the diagonal are between-person (BP), and correlations below the diagonal are within-person (WP).

Table 2
Results for the Multivariate Model for Negative Affect Parameters

	M		Longest duration	
	Model 1	Model 2	Model 1	Model 2
Variables	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)
Intercept	.2207 (.0102)	.1654 (.0098)	1.0074 (.03)	.8179 (.0298)
Age (linear)	**−.0034 (.0005)**	−.0007 (.0004)	**−.0103 (.0014)**	−.0023 (.0013)
Age (quadratic)	.0001 (.00004)	.0001 (.00003)	**.0004 (.0001)**	**.0004 (.0001)**
Ethnicity	**−.037 (.0084)**	**−.0385 (.0075)**	**−.1693 (.0246)**	**−.1768 (.022)**
Education	.0041 (.0061)	**.0171 (.0056)**	.0236 (.0181)	**.0666 (.0166)**
Gender	**−.0148 (.0057)**	−.0061 (.0051)	**−.0516 (.0168)**	−.0237 (.0151)
BP Negative events	—	**.4863 (.0209)**	—	**1.4655 (.0614)**
WP Negative events	—	**.1565 (.0041)**	—	**.5145 (.0147)**
BP Positive events	—	**−.1260 (.0198)**	—	**−.3280 (.0582)**
WP Positive events	—	.0052 (.0046)	—	.0274 (.0166)
Heterogeneous variances	**−.0191 (.0035)**	**−.0198 (.0034)**	**.0623 (.0071)**	**.0625 (.0074)**
BP Pseudo-R^2	.0762		.0861	
WP Pseudo-R^2	.1225		.0695	

Note. BP = between-person; WP = within-person. The estimate for heterogeneous variances is an estimate of the effect of age on the variance of the affect variable. Pseudo-R^2 represents proportion of variance accounted for by the inclusion of event-level predictors in Model 2. Values in bold significant $p < .05$.

for the negative affect parameters. Between person levels of positive events predicted lower levels of the negative affect outcomes although the occurrence of daily positive events did not.

Figure 1 displays the means and duration for negative affect. For this figure, we estimated values for people who were one standard deviation below the mean age value, at the mean, and one standard deviation above the mean. We present these estimates reflected in categorical bars as opposed to continuous lines to clarify that we are examining age differences and do not examine longitudinal change that may be implied by growth curves. Using pseudo-R^2 we found that including events explained approximately 7.6% of the variance between individuals and 12.3% of the variance within individuals for average negative affect. For duration, including events accounted for approximately 8.6% and 6.9% between and within individuals, respectively.

When examining age differences in the variability of the daily mean and duration of negative affect across the 8 days, older age was associated with significantly lower levels of variability for mean levels, and significantly higher levels of variability for duration (results are displayed in Table 2). Results remained essentially unchanged when daily events were added to the model. Thus, the context of daily life did not attenuate the variability of mean levels and longest duration of daily negative affect.

Positive affect. Consistent with our hypotheses, successively older adults had higher mean level and higher duration positive affect in analyses where only the covariates of gender, education,

Table 3
Results for the Multivariate Model for Positive Affect Parameters

	M		Longest duration	
	Model 1	Model 2	Model 1	Model 2
Variables	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)
Intercept	2.7723 (.028)	2.7663 (.0272)	3.4291 (.0203)	3.3991 (.0211)
Age (linear)	**.0119 (.0013)**	**.0058 (.0013)**	**.0078 (.0009)**	**.0052 (.001)**
Age (quadratic)	**−.0003 (.0001)**	**−.0002 (.0001)**	−.00002 (.0001)	.00002 (.0001)
Ethnicity	.0053 (.0228)	−.0082 (.0216)	.0262 (.0166)	.0123 (.0163)
Education	.0287 (.0169)	.0213 (.0163)	.0024 (.0123)	.0125 (.0123)
Gender	.0018 (.0157)	−.0091 (.0148)	.0059 (.0114)	.0065 (.0112)
BP Negative events	—	**−.9590 (.0600)**	—	**−.3365 (.0453)**
WP Negative events	—	**−.1488 (.0077)**	—	**−.0373 (.0083)**
BP Positive events	—	**.5336 (.0572)**	—	**.3934 (.0431)**
WP Positive events	—	**.0861 (.0086)**	—	**.0754 (.0094)**
Heterogeneous variances	−.000003 (.003)	−.0003 (.0033)	**−.0145 (.0045)**	**−.0153 (.0049)**
BP Pseudo-R^2	.0683		.0691	
WP Pseudo-R^2	.0564		.0086	

Note. BP = between-person, WP = within-person. The estimate for heterogeneous variances is an estimate of the effect of age on the variance of the affect variable. Pseudo-R^2 represents proportion of variance accounted for by the inclusion of event-level predictors in Model 2. Values in bold significant $p < .05$.

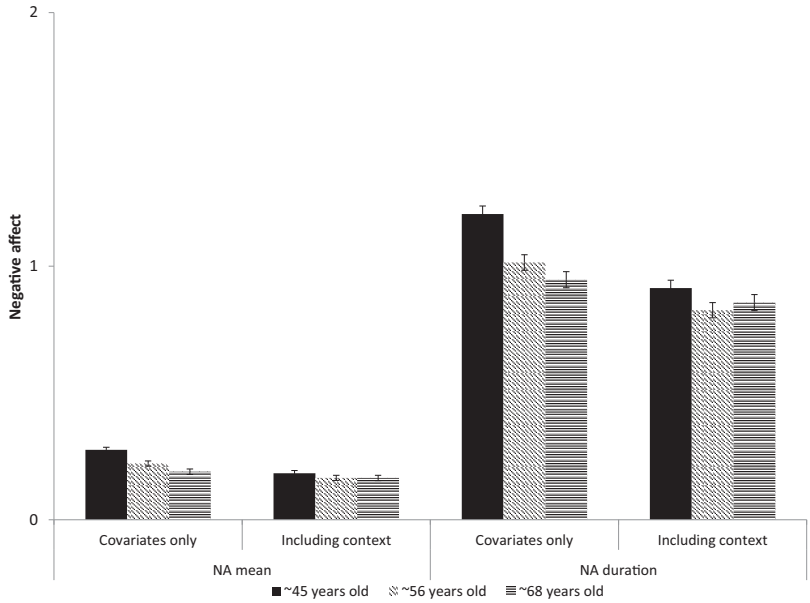

Figure 1. The mean and longest duration of daily negative affect estimated across three age groups.

and ethnicity were included. No covariates significantly predicted positive affect outcomes. These linear effects were qualified by a quadratic effect for average level only ($p = .004$); estimates of mean levels were higher with age from age 35 until approximately age 70, after which time a slight decrease was indicated. The estimated values of the oldest adults in the sample, however, were higher than those estimated for the youngest adults. Model 2 added both between-person and within-person negative and positive events to examine whether age differences would remain when the context of daily life (stressors and uplifts) was considered. The age differences in mean and duration for positive affect remained, as did the quadratic effect on average positive affect. Thus, daily life events assessed in this study did not account for age differences in mean level or duration of positive affect.

Individual level and daily stressful events were related to lower levels of average and shorter duration of positive affect. Individual level and daily positive events predicted higher average and longer duration of positive affect. Figure 2 displays estimates for the mean and duration for positive affect from this model. Using pseudo-R^2 to quantify the variance accounted for by adding events, we found that events explained 6.8% of the variance in average positive affect between individuals and 5.6% within individuals. For duration, positive events explained 6.9% of the variance in positive affect between individuals and .86% of the variance within individuals.

When examining the variability of averaged daily mean levels and longest duration of positive affect across the 8 days, only duration showed a significant, slight increase with age. This effect did not significantly differ when daily events were added to the model.

Discussion

The current study provides insight into the daily affective experience of people across most of the adult life span. Two prior studies focused on how age differences in stressor occurrence may

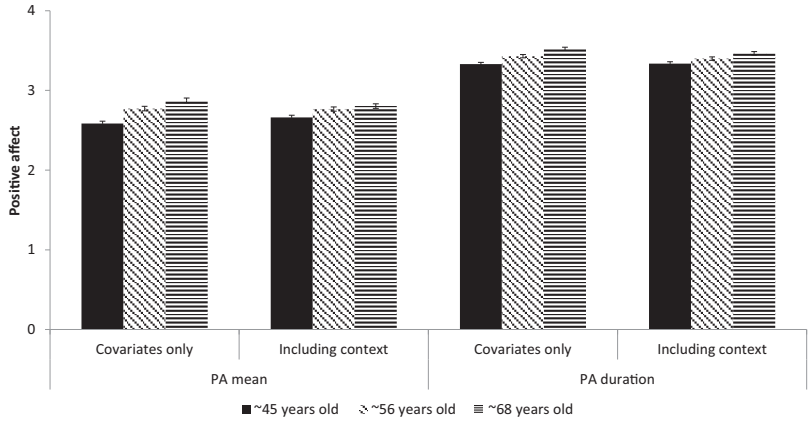

Figure 2. The mean and longest duration of daily positive affect estimated across three age groups.

account for age difference in affective well-being: one focused on mean levels of affect in an older sample (Charles et al., 2010) and the other focused on negative affect variability by comparing younger and older adults (Brose et al., 2013). By including midlife in this study and examining both average levels and the daily longest duration of both positive and negative affect, we gain a more complete picture of how affective experience varies across most of the adult life span.

We examined age differences in mean levels and duration of positive and negative states with and without adjusting for life context, defined in this study as the occurrence of and reactivity to both uplifts and stressors. For self-reports of negative emotions, a model without adjusting for daily events largely reflected existing findings in the literature—mean levels decreased with age, as did the longest duration of daily negative affect. A slight upturn occurred among people in their 70s, but this upturn never resulted in our estimates for the oldest adults reaching the levels estimated for the youngest adults. After adjusting for context by including both daily occurrence and average levels of weekly uplifts and stressors, age was no longer related to these linear decreases in negative affect.

For positive affect, adjusting for weekly events did not change the pattern of greater age-related mean levels and longest duration. Although a slight downturn in positive affect occurred after around age 70, estimates for both mean level and duration of positive emotions for the oldest adults were higher than those estimated for the youngest adults in this sample. These results, showing small but significant age differences, reveal the importance of daily stressful life events for age-related patterns of mean level and duration of negative affect but not for positive affect.

Mean Levels of Negative and Positive Affect

Lazarus (1996) emphasized the importance of taking life context into consideration when examining age differences in emotional experience. In the current study, negative stressors play a significant role in the association between age and mean levels of negative affect. This finding is consistent with SAVI, which posits that when older adults cannot avoid sources of arousal and distress, age differences in negative affect are no longer present and sometimes even reverse in direction. The attenuation, and in this case, absence of age differences in mean levels of negative affect after adjusting for context in this study, supports this proposition.

In contrast, mean levels of positive affect increased with older age across all analyses. These findings suggest that greater age-related positive affect may be driven by other factors besides exposure to unpleasant events. Notably, positive events did not influence age differences in mean levels of positive or negative affect. The number of reported positive events did not vary with age, and the age-related decrease in stressors did not account for the higher levels of positive affect. Turning to reasons beyond stressors and uplifts, one possible explanation for this age difference may be that older age is related to greater motivation to focus on positive appraisals about life. This possible explanation is in line with the positivity effect, which suggests that older adults attend to and remember more positive features of their environments and their lives than do younger adults (see review by Reed et al., 2014). According to socioemotional selectivity theory, greater freedom from the pressure and concerns of preparing for a long and uncharted future allow older adults to focus on and savor the present moment (see review by Charles & Hong, in press). The finding that age differences for positive affect in mean levels remained after adjusting for daily experiences suggests that appraisals may play a stronger role than activities for this association. The importance of appraisals for positive affect particularly among older adults is also consistent with findings from a study examining age differences in the use of different emotion regulation strategies (Shiota & Levenson, 2009). In this laboratory study, older age was related to enhanced subjective well-being when instructed to engage in positive reappraisal, but not when instructed to down-regulate negative affect.

Duration of Negative and Positive Emotions

We also examined the longest duration of a single reported emotional experience each day, separately for positive and negative emotions. Findings indicate that older age is related to shorter durations of negative affect and longer durations of positive affect before adjusting for negative and positive events. Older age, then, served to extend the time spent experiencing a prolonged positive emotional state and reduced the time experiencing a prolonged negative emotional state. This finding is consistent with the opinions of adults when asked about the duration of their positive and negative emotions (Lawton et al., 1992) and their self-reported control over emotions (Gross et al., 1997). When adjusting for the occurrence and reactivity to positive and negative events, however, the linear effect of age was no longer significant for negative affect. Similar to the findings for overall mean levels, these results suggest that older age may not confer general emotion regulation benefits; instead, older adults may experience shorter durations of negative emotion than younger adults when they can avoid negative situations (Charles, Piazza, Luong, & Almeida, 2009).

In contrast, we did not find that the context of daily life accounted for age differences in the duration of positive emotional states. The current literature in emotion and aging focuses on the importance of daily events, but this research also largely focuses on negative emotional experience (e.g., Brose et al., 2013). The current findings suggest that context is important for negative affect, but other factors are responsible for age-related patterns of positive affect. In fact, age was unrelated to the occurrence of a positive event, and age was unrelated to how these events influenced levels of positive affect. Future studies and discussions of emotion and aging will benefit from differentiating factors related to the elicitation and regulation of emotion for positive and negative emotions separately.

Strengths, Limitations, and Issues of Generalizability

Prior researchers have noted that samples including greater age ranges find larger age effects for affective measures (e.g., Pinquart, 2001). This large study, spanning five decades of adulthood, provides a robust study of age effects. We do not expect large age differences in affective experience; temperament and other emotion-related constructs are fairly stable across time. Yet, these findings are consistent with a number of studies suggesting small, but significant, variation with age (Pinquart, 2001). The current study permitted a view into the daily lives of many American adults and may have detected subtle differences that smaller samples would be unable to detect based on power limitations.

The hypotheses were built on the premise that older age is related to higher levels of well-being, and that the context of daily life explains this age difference. Although this premise was supported in this sample, other groups of adults do not display this age-related pattern. For example, one study found that older age was related to lower levels of well-being (defined as self-reported levels of happiness and satisfaction) in countries where the gross domestic product (GDP) was low (Swift et al., 2014). This finding, therefore, suggests that a worse economic climate creates a context where "the paradox of aging" is not observed. Even in the current sample, older adults who live with chronic financial stress may not have higher levels of well-being than their younger counterparts. Future studies will have to examine different aspects of the context of daily life—both acute events and more chronic situations—that influence affective experience and that were not assessed in this current study.

Another limiting aspect is that, like every study of affect, findings are dependent on the list of emotions and emotion states included; a different collection of positive or of negative emotions (e.g., boredom or ecstasy) may produce scores that vary from the ones we found. The strong internal reliability for the factors encompassing positive and negative emotions, however, suggests that the specific type of emotions reported may not be as important as the overall valence. Furthermore, this study queried people about events that had occurred within the past 24 hr; memory bias more than likely plays a role that cannot be disentangled from the findings without momentary sampling data. This reliance on memory is commonly used to assess life satisfaction, weekly or monthly emotional experience, and in diagnoses of affective disorders. These types of reports also predict behaviors often better than momentary assessments of experience (e.g., Levine, Lench, & Safer, 2009). Nonetheless, affective measures that vary across different temporal epochs yield slightly different age-related findings (e.g., Charles et al., 2015), and future studies will have to compare and contrast their differential predictive ability for different types of outcomes.

In addition, we infer that daily events are related to—and influence—affective experience. The reverse could also be true, however. In days when people are experiencing negative affect, they may experience life as more stressful and report more stressors. In addition, they may engage in fewer pleasant activities. Without controlling exposure to stressors and uplifts, we cannot infer a causal pathway.

Taking into account these caveats, these findings nonetheless largely reassure us that affect is not poorly regulated with age. These basic, inherent processes that underlie thought and behavior seem to remain fairly intact even among the oldest adults studied in this sample. Although people often fear that their satisfaction will decline in later life (e.g., Röcke & Lachman, 2008), these projections are not confirmed among middle-class Americans. Taken together, the experience of older age—whether from daily experiences or others factors such as life appraisals—is characterized by a more positive affective trajectory across these successively older adults, and a less negative one as a function of the context of their daily lives.

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