Nostalgia and Well-Being in Daily Life: An Ecological Validity Perspective

4 authors, including:

David B Newman
University of Southern California

9 PUBLICATIONS **228** CITATIONS

SEE PROFILE

Arthur A. Stone
University of Southern California

255 PUBLICATIONS **24,603** CITATIONS

SEE PROFILE

Norbert Schwarz
University of Southern California

433 PUBLICATIONS **41,243** CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Project Self-report biases in people of different ages; innovative EMA pain measures View project

Project Embodied metaphors in judgment and decision making View project

Nostalgia and Well-Being in Daily Life: An Ecological Validity Perspective

David B. Newman, Matthew E. Sachs, Arthur A. Stone, and Norbert Schwarz
University of Southern California

Nostalgia is a mixed emotion. Recent empirical research, however, has highlighted positive effects of nostalgia, suggesting it is a predominantly positive emotion. When measured as an individual difference, nostalgia-prone individuals report greater meaning in life and approach temperament. When manipulated in an experimental paradigm, nostalgia increases meaning in life, self-esteem, optimism, and positive affect. These positive effects may result from the specific experimental procedures used and little is known about daily experiences that covary with nostalgia. To address this gap, we aimed to measure nostalgia in ecologically valid contexts. We created and validated the Personal Inventory of Nostalgic Experiences (PINE) scale (Studies 1a–1d) to assess both trait and state-based nostalgic experiences. When measured as an individual difference, the nomological net was generally negative (Study 2). When measured in daily life (Studies 3 and 4), nostalgia as a state variable was negatively related to well-being. Lagged analyses showed that state nostalgia had mixed effects on well-being at a later moment that day and negative effects on well-being on the following day. To reconcile the discrepancies between these studies and the positive effects of nostalgia from previous research, we showed that experimentally induced nostalgic recollections were rated more positively and less negatively than daily experiences of nostalgia (Study 5). These studies show that nostalgia is a mixed emotion; although it may be predominantly positive when nostalgic memories are generated on request, it seems predominantly negative when nostalgia is experienced in the course of everyday life.

Keywords: nostalgia, well-being, ecological validity, ecological momentary assessment, diary study

Supplemental materials: http://dx.doi.org/10.1037/pspp0000236.supp

Nostalgia is often classified as a mixed emotion because it is composed of positive and negative aspects. The Oxford English dictionary defines nostalgia as "A sentimental longing or wistful affection for a period in the past." Similar to other emotions, nostalgia presumably varies within individuals. Someone may feel nostalgic at a particular moment in time but not the next. The intensity of nostalgic feelings may also vary considerably from moment to moment or from day to day. Moreover, these fluctuating states of nostalgia likely occur concurrently with a variety of situations, contexts, and internal states. Currently very little is known about the daily experiences that occur in real time when people feel nostalgic. The goal of the present set of studies was to examine the daily experiences, feelings, thoughts, and states of well-being that accompany feelings of nostalgia.

Review of Empirical Findings on Nostalgia

Recent empirical findings from psychology suggest that nostalgia is associated with numerous psychological benefits. For example, nostalgia-prone individuals (those who report higher levels of intensity and frequency of nostalgia) report greater meaning in life (Cheung et al., 2013; Routledge et al., 2011) and approach motivation (Stephan et al., 2014), a dimension of personality that, in contrast to avoidance motivation, is associated with positive emotionality (Elliot & Thrash, 2010). In experimental settings, nostalgia increases meaning in life, optimism, self-esteem, social connectedness, and positive affect (Cheung et al., 2013; Routledge et al., 2011; Wildschut, Sedikides, Arndt, & Routledge, 2006). In a recent review of the literature, Sedikides and colleagues concluded that ". . . nostalgia is considered an emotion, and a predominantly positive one at that" (Sedikides et al., 2015, p. 6).

Recent theories hold that feelings of nostalgia are associated with positive outcomes because of two different mechanisms. One mechanism is a regulatory, restorative, or palliative function in which nostalgia buffers certain negative effects. When negative events occur, they can influence an individual in a negative manner by decreasing well-being. Negative events can also trigger feelings of nostalgia, and these nostalgic experiences attenuate the associated negative effects. For example, the negative effects of experimentally induced self-threat (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012) and perceived meaninglessness (Routledge et al., 2011) have been attenuated by recalling nostalgic experiences. In correlational studies, the negative effects of loneliness have been buffered by nostalgia (Zhou, Sedikides, Wildschut, & Gao, 2008). Presumably, recalling nostalgic experiences increases one's sense of social connectedness, which is assumed to restore one's well-being after a negative experience.

A second mechanism of nostalgia is one in which nostalgia serves self-oriented, existential, and social functions, which subsequently lead directly to positive outcomes. In terms of its self-orienting function, participants in one study reported higher self-esteem after listening to a nostalgic song (Cheung et al., 2013). People also reported higher optimism about their future after smelling scents that made them feel nostalgic (Cheung et al., 2013). Regarding the existential function, after pondering a past nostalgic event, people reported lower levels of searching for meaning in life (Routledge et al., 2011). Finally, several studies support a social function of nostalgia. For example, after participants were instructed to think about the most nostalgic experience in their own lives, they reported lower attachment anxiety and avoidance (Wildschut et al., 2006 Study 6), a higher degree of social support (Zhou et al., 2008), and an increased level of trust toward an outgroup member (Turner, Wildschut, & Sedikides, 2012). Recalling a nostalgic memory has even increased prosocial behavior, such as helping a stranger pick up dropped pencils (Stephan et al., 2014) and donating to charity (Zhou, Wildschut, Sedikides, Shi, & Feng, 2012). In summary, various mechanisms suggest that nostalgic recollections can lead to positive outcomes (for a review, see Sedikides et al., 2015).

Ecological Validity Considerations

Although such experimental studies are informative in providing information about psychological processes involved in nostalgia and its outcomes, they tell us little about the emergence and consequences of nostalgia in everyday life (Brunswik, 1956; Shiffman & Stone, 1998). In the absence of such information, one cannot even determine to what extent the experimental settings created by researchers mimic circumstances that elicit feelings of nostalgia in natural contexts. It also remains unknown what types of situations, feelings, and states of well-being are likely to co-occur with nostalgia in daily life. To our knowledge, only one study has captured nostalgia as it has occurred in daily life (Zhou, Wildschut, Sedikides, Chen, & Vingerhoets, 2012, Study 1). In this study, 19 Chinese participants recorded how nostalgic they felt each evening over the course of 30 days. Participants were more likely to feel nostalgic on cold days than on warm days. No other situational factors or internal feelings were assessed in this study, however. Clearly, there is a dearth of information about the daily experiences that could covary with daily states of nostalgia.

Our aim was to bridge this gap in the literature by examining and measuring nostalgia in daily life through the use of daily diary (Bolger, Davis, & Rafaeli, 2003) and ecological momentary assessment (EMA) techniques (Stone & Shiffman, 1994). Diary and EMA studies are designed to capture behavior, thoughts, and feelings as they occur in real time in daily life (Shiffman, Stone, & Hufford, 2008). One advantage of this methodology is that recall biases are limited; daily or momentary reports are much more accurate in capturing affective experience than global recalls (Stone & Mackie, 2013, pp. 29–30; Robinson & Clore, 2002; Schwarz, 2012). Such techniques allow the researcher to measure "life as it is lived" (Bolger et al., 2003), suggesting that EMA techniques can greatly enhance our understanding of nostalgia in real-world settings.

Another advantage of daily diary and EMA techniques is that they can capture ordinary feelings and experiences, whereas experimental manipulations often privilege unusual experiences in the interest of strong manipulations. Indeed, the most common experimental manipulation of nostalgia is the Event Reflection Task, which asks participants to ". . . think of a past event that makes you feel *most* nostalgic" (italics added for emphasis). Such instructions explicitly ask for an event that is likely to differ from one's most common nostalgia experiences, which are not the "most" nostalgic ones. In other studies (Iyer & Jetten, 2011, Study 3; Wildschut et al., 2006, Study 6), participants were asked to recall a nostalgic event that had personal meaning (e.g., "please think of a nostalgic event in your life—a nostalgic event that has personal meaning for you"). Asking for a "meaningful" event increases the odds that the recalled event affects well-being related measures, which may or may not be the case for other episodes of nostalgia. In short, commonly used experimental instructions in nostalgia research compound the concerns usually associated with recall-based reports (for reviews, see Schwarz, 2012; Schwarz, Kahneman, & Xu, 2009), including the higher memorability of extreme and personally meaningful events and the disproportionate impact of peaks and ends (Fredrickson & Kahneman, 1993; Morewedge, Gilbert, & Wilson, 2005). Moreover, negative affect associated with past events has often been found to fade quicker than positive affect (e.g., Ritchie et al., 2006; Walker, Vogl, & Thompson, 1997), adding a risk of differential affect reconstruction when people report on distant episodes. People also remember central aspects of nostalgia (e.g., fond memories, personal meaning, and happiness), which tend to be relatively positive, more easily than peripheral aspects of nostalgia (e.g., mixed feelings, regret, loneliness, and pain/anxiety), which tend to be relatively negative (Hepper, Ritchie, Sedikides, & Wildschut, 2012), again enhancing the risk of biased reconstruction.

All of these concerns should be attenuated when participants report how nostalgic they feel in real time. Concurrent or temporally close reports can provide a more representative sample of nostalgic experiences, including experiences of lower intensity. They also bypass the difficulties associated with selecting and reconstructing a past experience. In addition, any negative affect that may be associated with nostalgia is less likely to be missed in real-time reporting. By the same token, however, real-time assessments of nostalgia are unlikely to capture rare episodes of particularly intense nostalgia, unless the sample of persons and/or time points is very large. Hence, real-time studies may miss benefits that are uniquely associated with peak nostalgia experiences.

Based on these considerations we hypothesized that the relationship between nostalgia and well-being captured in everyday experiences would not be as positive as suggested by much of the experimental work (Sedikides & Wildschut, 2018). We further predicted that the nomological net of nostalgia would be mixed, that is, nostalgia would relate to some positive and some negative attributes. This pattern of findings would be consistent with common definitions of nostalgia that contain positive and negative aspects. The Greek origin of the word nostalgia even contains positive and negative aspects (*nostos* = "return home," *algos* = "pain").

Measurement of Nostalgia

To test this hypothesis and evaluate the experience of nostalgia in daily life, we needed to create a measure that could capture nostalgia in ecologically valid settings. Some existing scales measure nostalgia in very specific settings, such as in the context of marketing (Pascal, Sprott, & Muehling, 2002), and in response to advertisements (Marchegiani & Phau, 2013). The Nostalgia Inventory (Batcho, 1995) lists specific aspects of one's past that one misses, such as family, places, toys, and music. This restricts the concept of nostalgia to aspects of one's past that one misses and excludes other aspects, such as the extent to which one yearns for and desires to return to or relive a past experience or situation.

The most widely used measure of nostalgia, the Southampton Nostalgia Scale (SNS; Barrett et al., 2010; Routledge, Arndt, Sedikides, & Wildschut, 2008), is also not ideal for our purposes. The most recent version of the scale contains seven items designed to assess nostalgia proneness as an individual difference (Barrett et al., 2010). Each item contains the word "nostalgia" which creates a narrow construct. As McCrae (2015) noted, trait variance becomes confounded with specific item variance when an instrument is dominated by almost identical questions, a technique that Cattell (1973) once called a "bloated specific." Additionally, one item of the SNS asks participants to recall how often they bring to mind nostalgic experiences with responses ranging from "At least once a day" to "Once or twice a year." This question assumes that nostalgia is a dichotomous variable (e.g., one either feels nostalgic or not) rather than a continuous variable (e.g., one can feel nostalgic to varying degrees). Finally, two of the SNS items ask participants how valuable and significant nostalgic feelings are to them, which selectively directs attention to positive aspects of nostalgia. In summary, published scales assessing nostalgia have either measured the construct in highly specific contexts, have asked participants questions that rely on extensive recall, or have included aspects that do not pertain to the experience per se.

Overview of Present Studies

As a first step, we created and validated a brief trait nostalgia scale (Studies 1a–1d). Next, we examined the between-person relationships between nostalgia, personality, and well-being measured as traits or individual differences to assess the nomological net of nostalgia (Study 2). To ascertain the usefulness of this new scale, we additionally compared the strengths of the relationships between our new scale and other constructs with the relationships between the SNS scale and other constructs.

Following scale construction, we conducted a daily diary study (Study 3) to address our primary research aim of understanding how nostalgia relates to other daily experiences, feelings, and thoughts in a naturalistic setting. The intensive repeated measures nature of a diary study also allowed us to examine within-person relationships, a level of analysis that is statistically orthogonal to between-person relationships (Nezlek, 2001). Separating within-person and between-person variance in nostalgia considerably extends the research agenda, given that theories concerning the relationship between nostalgia and well-being have been tested almost exclusively with between-person designs. In Study 4, we conducted an EMA study in which participants reported their momentary nostalgic feelings and well-being at randomly selected time points throughout the day, thus eliminating the need to recall any past experiences. The findings from these naturalistic studies diverged from experimental findings by showing that nostalgia is a mixed emotion, although more strongly associated with negative feelings than positive feelings. Study 5 addressed this divergence between experimental and real-time findings by comparing recalled nostalgic experiences with daily nostalgic experiences. This comparison allowed us to determine whether experimentally induced nostalgic recollections are more positive than everyday nostalgic experiences, a difference that may drive the associations observed in Studies 3 and 4.

Studies 1a–1d: Scale Construction

The purpose of the first set of studies was to develop a short nostalgia scale. Although our primary goal was to create a scale that could assess nostalgia at the daily level, we additionally aimed to test the psychometric properties of the scale as an individual difference measure. We initially asked participants to think of their life in general to assess a trait-like individual difference measure of nostalgia. The creation of a trait measure of nostalgia would serve as a foundation for developing daily items to be administered in daily diary studies.

Study 1a

Method

The cognitive interview portion of Study 1a was approved by the Institutional Review Board at the University of Southern California under the ID UP-15–00625 (Cognitive interview). The latter part of Study 1a, Study 1b, Study 1c, Study 2, and Study 3 were approved by the Institutional Review Board at the University of Southern California under the ID UP-15–00479 (Daily diary study: State and trait measures).

To generate items for a measure of nostalgia, we initially drew from four primary sources. First, we considered words written by students about a recent nostalgic experience (Wildschut et al., 2006). Second, we read definitions from several dictionaries, such as Oxford, Merriam-Webster, and Collins English. Third, we considered the items from scales that have been used to measure nostalgia in specific contexts, such as the personal nostalgic response to advertisements (Marchegiani & Phau, 2013), the Evoked Nostalgia Scale to assess nostalgia in marketing contexts (Pascal et al., 2002), and the Batcho Nostalgia Scale (Batcho, 1995) designed specifically to assess the extent to which people miss aspects of their past. Fourth, to assess nostalgia in an ecologically valid context, we called 33 undergraduate students (M_{age} = 20.09, SD =

1.4; 51.52% female) in the evening between 9:00–11:30 p.m. and asked them to recount the events of their day. After reconstructing their day, we asked participants how nostalgic they felt today on a 10-point scale (1 = *not at all*, 10 = *very much*). After the participants provided a numeric rating, we asked them what words came to mind when they heard the word "nostalgia" or what they thought of when they thought of the word nostalgia. The answers to these questions are listed in supplemental Table 1.

From these sources, we created a list of 15 items with the goal of capturing a wide variety of language used to define nostalgia. We placed a particular emphasis on the responses recorded by participants at the end of their day because these descriptions were recorded in an ecologically valid setting (see supplemental Table 2). We then administered the 15-items to 470 undergraduate students from a large private university in the United States. Participants were asked, "Please indicate the extent to which each of the following statements describe you in general." Responses were recorded on a 7-point scale (1 = *not at all*, 7 = *very much*). As recommended by Meade and Craig (2012), we included an instructed response item to capture insufficient effort responses: "Please select the choice 'Very much' for this question." Twenty-six participants failed to answer this question correctly and their data were removed; final analyses included data from 444 participants (M_{age} = 20.21, SD = 2.82; 77.5% female).

Results

We factor analyzed responses to the 15 items with the R package semTools and the function factanal. First, we examined the eigenvalues (7.62, 1.28, .93, .69, .60, . . .). A single factor solution seemed most reasonable, but we also examined a two-factor model using a maximum likelihood estimation with direct oblimin rotation (as recommended by Costello & Osbourne, 2005). The items did not load onto the two respective factors in a meaningful manner, so we opted for a single factor model. The factor loadings are presented next to items in supplemental Table 2.

Study 1b

Method

Some of the 15 items were redundant. Because our goal was to create a brief scale, we kept the first six items because they had high factor loadings and still contained varied descriptions of nostalgia. We distributed the shortened scale to 298 undergraduate students from the same university as Study 1a (M_{age} = 19.48, SD = 1.69, 71.5% female) in a similar manner.

Results

We ran a confirmatory factor analysis (CFA) using the lavaan package (Rosseel, 2012) in R. All six items were treated as indicators of a latent construct of nostalgia. The variance of the latent construct was fixed at 1 so that we could estimate each factor loading. The data were not multivariate normal as indicated by Mardia's tests of skewness, $\hat{\gamma}_{1,p}$ = 3.82, $p < .001$, and kurtosis, $\hat{\gamma}_{2,p}$ = 65.12, $p < .001$, so we used a maximum likelihood estimator with robust standard errors (Yuan & Bentler, 2000). The standardized loadings of each indicator were as follows: .74, .81,

.70, .81, .76, .83. The model fit was not optimal, $\chi^2(9)$ = 89.58, $p < .001$; root mean square error of approximation (RMSEA) = .228, 90% confidence interval (CI) [.186, .272]); comparative fit index (CFI) = .874; standardized root mean square residual (SRMR) = .065. Therefore, we tested alternative models by dropping items that we felt were redundant with the others. After dropping items 2 and 4, we found good model fit with items 1, 3, 5, and 6 as indicators of a latent construct. Standardized factor loadings were .83, .81, .83, .65 and the model fit was considerably better, $\chi^2(2)$ = .85, $p = .66$; RMSEA = .000, 90% CI [.000, .121]; CFI = 1.00, SRMR = .008. These four items were as follows: "How nostalgic do you feel?", "To what extent do you feel sentimental for the past?", "How much do you feel a wistful affection for the past?", and "To what extent do you feel a longing to return to a former time in your life?"

Study 1c

Method

Although the four-item model showed good model fit, we may have capitalized on chance given that the shortened four-item model was generated after we tested model fit with the initial 6-items. To rule out this possibility, we administered the shortened four-item scale to 440 undergraduate students (M_{age} = 20.13, SD = 1.93; 69.8% female) during the next semester in a similar manner as before.

Results

We ran a CFA with the four items as indicators of a single latent construct as described previously. The data were not multivariate normal as indicated by Mardia's tests of skewness, $\hat{\gamma}_{1,p}$ = 1.62, $p < .001$, and kurtosis, $\hat{\gamma}_{2,p}$ = 32.61, $p < .001$. Therefore, we used a maximum likelihood estimator with robust standard errors (Yuan & Bentler, 2000). The standardized factor loadings were all above .70: .82, .84, .85, and .72. Model fit indicators were good: $\chi^2(2)$ = .57, $p = .75$, RMSEA = .000, 90% CI [.000, .092], CFI = 1.000, SRMR = .005. Revelle's ω coefficient to test reliability was also sufficiently high (.89) as was Cronbach's α (.87). We note that Cronbach's α has several documented limitations (Bentler, 2017; McNeish, 2017), but we report it throughout nevertheless because of its widespread use. In summary, the four-item measure of nostalgia demonstrated excellent psychometric properties. The four items are highlighted with an asterisk in supplemental Table 2 and can additionally be found in the Appendix.

Study 1d

Method

Study 1d was approved by the Institutional Review Board at the University of Southern California under the ID UP-16–00003 (test–retest reliability). Next, we tested the reliability of the trait measure by assessing nostalgia as an individual difference at two time points separated by 10 weeks. This enabled us to examine measurement invariance and the correlation between latent constructs at two time points.

There were 198 undergraduate students signed up for the study and completed the first measure of nostalgia in exchange for research credit for a course. The first questionnaire was distributed at the beginning of the semester and the follow-up questionnaire was distributed 10 weeks later. Twelve participants did not complete the second questionnaire. Final analyses included 186 participants (M_{age} = 20.28, SD = 2.57; 77.4% female). Participants who completed both questionnaires did not differ significantly from participants who only completed the first questionnaire in terms of their age, $t(16.79)$ = 1.76, p = .31, ratio of males to females (odds ratio = 1.14, p = .74), or mean levels of nostalgia, $t(12.13)$ = 1.65, p = .13. Similar to the previous studies, participants were asked to think about their life in general as they completed the four-item nostalgia scale.

Results

Means, standard deviations, skewness, kurtosis, and interitem correlations for the trait version of the scale are presented in supplemental Table 3. Revelle's ω measure of reliability was .91 (α = .88) at Time 1 and .89 (α = .88) at Time 2.

We tested measurement invariance across time points using a confirmatory factor analysis approach as outlined by Vandenberg and Lance (2000). The four nostalgia items distributed at Time 1 were treated as indicators of a latent construct at Time 1, and the four nostalgia items at Time 2 were similarly treated as indicators of a latent construct at Time 2. Errors terms of each nostalgia item at Time 1 were allowed to freely covary with each respective nostalgia item at Time 2 (e.g., item1 at Time1 with item1 at Time2). Variances of each latent construct were fixed to 1 and the latent constructs were allowed to freely covary.

First, we found that the data were not multivariate normal as indicated by Mardia's tests of skewness, $\hat{\gamma}_{1,p}$ = 6.80, p < .001, and kurtosis, $\hat{\gamma}_{2,p}$ = 90.77, p < .001, so we used a maximum likelihood estimator with robust standard errors (Yuan & Bentler, 2000). The model fit was good: $\chi^2(2)$ = 18.62, p = .23; RMSEA = .040, 90% CI [.000, .091]; CFI = .995; SRMR = .025. The standardized factor loadings at Time 1 were .85, .87, .82, and .70; at Time 2, the standardized factor loadings were .84, .84, .85, and .69. The standardized covariation between the latent nostalgia constructs at Time 1 and Time 2 was .64, z = 11.26, p < .001. Although this correlation was not as high as some correlations in test–retest reliability studies involving individual differences, it is similar to studies that have assessed positive and negative affect at multiple time points just 4 weeks apart (e.g., Lucas, Diener, & Suh, 1996).

More importantly, we tested measurement invariance to determine whether the latent constructs of nostalgia at both time points were represented by the four nostalgia items in similar manners. The four tests of measurement invariance increase in the extent to which they restrict the models to be similar to both time points. Configural or pattern invariance tests whether the number and pattern of factor loadings remains constant. Weak or metric invariance restricts the respective factor loadings at each time to be equal and tests whether the factor variances and covariances are equal across time points. Strong or scalar invariance restricts the intercepts to be equal at each time point and tests whether the means of each item are consistent. Finally, strict or error invariance restricts the uniquenesses or error terms of each indicator to

be equal. Typically, the former two tests of measurement invariance are considered adequate and the latter two tests are considered too strict (Little, 2013). As presented in supplemental Table 4, we found measurement invariance at each level of restriction. That is, not only were the factor patterns and factor loadings similar at each time point, but the factor means and error structures were also consistent over time. This suggests that the four items reliably measure the underlying construct in a similar manner over time.

Discussion

Thus far, we have established that the four-item measure of nostalgia concisely summarizes aspects of nostalgia using a variety of terms. The items show good internal consistency, and they hang together in a similar manner over time. We now name this scale the Personal Inventory of Nostalgic Experiences (PINE; see Appendix for the list of items).

Study 2: Individual Differences in Nostalgia

In this study, we examined the nomological net of nostalgia at a trait level of analysis. We relied on two of the major theories of personality, namely approach and avoidance temperament (Elliot & Thrash, 2002) and the Big Five personality traits (McCrae & Costa, 1987). Because nostalgia entails thinking about the past, we considered individual differences in time perspectives captured with the Time Perspective Inventory (Zimbardo & Boyd, 1999). We also included several well-being measures, such as satisfaction with life, meaning in life, affect, self-esteem, and depression because one of our primary aims was to understand the relationship between nostalgia and well-being. Finally, we examined the relationships between nostalgia and various other measures that often predict or relate to well-being, such as optimism, searching for meaning in life, regret, empathy, and inspiration. These variables have been measured in previous research on nostalgia, often as a dependent variable. Our goal was to examine these relationships at a trait level.

We also expected the PINE Scale to be positively related to the Southampton Nostalgia Scale while not being redundant as to suggest the items measure the same latent construct. Given that the Southampton Nostalgia Scale was correlated with various measures of well-being, a further goal of this study was to compare the strengths of the relationships between well-being and the PINE scale with those of the Southampton Nostalgia Scale.

Method

Participants and procedure. Undergraduate students completed online questionnaires in exchange for course research credit. Participants were instructed to reflect on their life in general as they responded to the questions. Seven samples of participants completed questionnaires online via the survey provider Qualtrics. Some of the measures were asked in multiple questionnaires, and we aggregated the samples to increase power in our calculations. Moreover, some participants completed multiple questionnaires. For these participants, we included their first questionnaire and excluded any additional questionnaires that contained a duplicate

measure. The total aggregated sample included 596 (M_{age} = 20.06, SD = 2.2; 72.80% female) unique participants.

Materials.

Nostalgia. Nostalgia was assessed in each sample with the four-item PINE measure with a 7-point response scale (1 = *not at all*, 7 = *very much*). In three of the samples, participants also completed the Southampton Nostalgia Scale, which contains 7 items. For example, "How valuable is nostalgia for you?" (1 = *not at all*, 7 = *very much*). When participants completed both scales in the same questionnaire, the order in which they completed scales was randomized and a few scales were included in between the separate nostalgia scales to distribute any potential context effects.

Personality traits and individual differences. Approach or avoidance temperament and the Big Five were used to assess personality. We used a 12-item scale to measure approach and avoidance temperament (Elliot & Thrash, 2010). Responses were recorded on a 7-point scale (1 = *strongly disagree*, 4 = *neither agree nor disagree*, 7 = *strongly agree*). In two samples (N = 171), we used a 44-item scale to assess the Big Five (John & Srivastava, 1999), and in one sample (N = 108) we used the newer 60-item Big Five 2 scale (Soto & John, 2017). Correlations between nostalgia and the five personality traits did not differ meaningfully between the two measures of the Big Five, so we combined the samples together for the analyses.

The Time Perspective Inventory (TPI; Zimbardo & Boyd, 1999) includes five factors to describe individual differences in how participants think about time: past positive (e.g., "It gives me great pleasure to think about my past"), past negative (e.g., "I think about the bad things that have happened to me in the past"), present fatalistic (e.g., "Since whatever will be will be, it doesn't really matter what I do"), present hedonic (e.g., "I believe that getting together with one's friends to party is one of life's important pleasures"), and future (e.g., "I believe that a person's day should be planned ahead each morning"). Responses were recorded on a 5-point scale (1 = *very uncharacteristic*, 5 = *very characteristic*).

Well-being and related constructs. Given the focus of the article, we included several well-being indicators and other constructs relevant to well-being (inspiration, empathy, searching for meaning in life, regret, and depression). Satisfaction with life was assessed with the five-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) with responses on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*).

Affect was measured using a circumplex model that distinguishes valence (positive and negative) and arousal (activated and deactivated; e.g., Feldman Barrett & Russell, 1998). Items were taken from a list of adjectives that have been used reliably in daily diary research (e.g., Brandstätter, 2007; Nezlek, 2005) and were worded to reflect one's life in general. Positive activated affect (PA) was assessed with the words enthusiastic, delighted, happy, glad, and excited; positive deactivated affect (PD) with the words calm, peaceful, relaxed, contented, and at ease; negative activated affect (NA) with stressed, angry, annoyed, tense, and nervous; negative deactivated affect (ND) with depressed, disappointed, miserable, gloomy, and sad. Responses were recorded on a 7-point scale (1 = *do not feel this way at all*, 4 = *feel this way moderately*, 7 = *feel this way very strongly*).

The two dimensions of meaning in life (presence and search) were assessed with the Meaning in Life Questionnaire (Steger,

Frazier, Oishi, & Kaler, 2006). Example items include "My life has a clear sense of purpose" and "I am searching for meaning in my life" for presence and search, respectively. Responses were recorded on a 7-point scale (1 = *absolutely untrue*, 7 = *absolutely true*). Self-esteem was assessed with the 10-item Rosenberg scale (Rosenberg, 1965) with responses recorded on a 4-point scale (1 = *strongly disagree*, 4 = *strongly agree*).

Regret was measured with a 5-item scale that has been used in the context of decision making (Schwartz et al., 2002). An example item is "When I think about how I'm doing in life, I often assess opportunities I have passed up," and responses were recorded on a 7-point scale (1 = *completely disagree*, 7 = *completely agree*).

Empathy was assessed with the Interpersonal Reactivity Index (Davis, 1983). The scale is composed of four subscales: perspective taking, fantasy, empathic concern, and personal distress. Given our interest in the broad concept, we created an aggregate score across all subscales. Participants responded on a 5-point scale (1 = *does not describe me well*, 5 = *describes me very well*).

Depression was measured using the Center for Epidemiologic Studies Depression Scale (Radloff, 1977), which instructs participants to recall how often they have felt a particular way during the past week. The scale contains 20-items (e.g., "I thought my life had been a failure"). Responses were recorded on a 4-point scale (0 = *rarely or none of the time [less than 1 day]* . . ., 3 = *most or all of the time [5–7 days]*).

Inspiration was measured with four items (e.g., "I feel inspired"). After each item, frequency and intensity were recorded with the questions "How often does this happen?" and "How deeply or strongly (in general)?" on 7-point response scales (1 = *never*, 7 = *very often*; 1 = *not at all*, 7 = *very deeply or strongly*, respectively; Thrash & Elliot, 2003). As recommended by Thrash and Elliot (2003), we aggregated these items for a total score of inspiration and present correlations with nostalgia and all three inspiration scores (frequency, intensity, and aggregate).

Means for each construct were calculated and used for the correlations with the exception of depression in which the sum was used. Reliabilities were calculated using Revelle's ω. The number of participants who completed each measure, the means or sums, and standard deviations for each measure are included in Table 1.

Results and Discussion

First, we examined the Pearson's correlations between nostalgia and personality traits, individual differences, and well-being measures. The results and descriptive statistics of the measures are presented in Table 1. Individuals who reported high levels of nostalgia reported high avoidance temperament but there was no significant relationship with approach temperament. In terms of the Big 5, nostalgia was only significantly (positively) related to neuroticism.

In terms of the time perspective inventory, nostalgia was positively related to past positive, past negative, present fatalistic, and present hedonic, but was not related to future. This suggests that individuals who are prone to nostalgia think about the past in both positive and negative ways, which is consistent with the notion that nostalgia is a mixed emotion. In a multiple regression model, we included both past positive and past negative as standardized predictors simultaneously and found that nostalgia was still sig-

Table 1
Descriptive Statistics and Trait Correlations Between Nostalgia and Predictors

Variable	N	Mean	SD	ω (α)	r
Nostalgia	596	4.23	1.49	.92 (.91)	
Personality/individual differences					
Approach	525	5.31	.98	.89 (.84)	.00
Avoidance	525	4.46	1.28	.88 (.83)	.22***
Agreeableness	279	3.71	.61	.81 (.72)	.05
Conscientiousness	279	3.41	.66	.87 (.83)	−.08
Extraversion	279	3.27	.77	.89 (.84)	−.07
Neuroticism	279	3.13	.77	.89 (.86)	.21***
Openness	279	3.69	.71	.89 (.86)	.05
Past positive	356	3.55	.67	.84 (.77)	.40***
Past negative	356	3.02	.77	.87 (.84)	.40***
Future	356	3.47	.59	.83 (.79)	−.02
Present fatalistic	356	2.58	.65	.81 (.76)	.32***
Present hedonic	356	3.42	.61	.88 (.85)	.20***
Well-being/relevant measures					
Satisfaction with life	526	4.73	1.32	.89 (.88)	−.08†
Positive activated affect	283	4.54	1.21	.92 (.90)	−.02
Positive deactivated affect	283	4.34	1.24	.92 (.90)	−.07
Negative activated affect	283	3.72	1.18	.88 (.80)	.34***
Negative deactivated affect	283	2.89	1.37	.79 (.91)	.34***
Meaning in life (presence)	525	4.56	1.29	.89 (.87)	−.11*
Meaning in life (search)	525	4.98	1.3	.93 (.91)	.19***
Self-esteem	299	3.28	.89	.95 (.90)	−.12*
Regret	526	4.52	1.12	.80 (.75)	.30***
Depression	220	21.09	12.12	.93 (.91)	.35***
Inspiration Frequency	452	4.95	1.28	.93 (.91)	−.02
Inspiration Intensity	452	4.58	1.26	.94 (.91)	.11*
Inspiration Aggregate	452	4.77	1.17	.96 (.93)	.05
Empathy	108	3.44	.45	.89 (.82)	.23*

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

nificantly related to past positive, $\beta = .43$, $t = 9.97$, $p < .001$, and past negative, $\beta = .43$, $t = 9.95$, $p < .001$.

Regarding well-being and related constructs, nostalgia was negatively (marginally) related to satisfaction with life, meaning in life (presence), and self-esteem; nostalgia was positively related to negative activated affect, negative deactivated affect, meaning in life (search), empathy, inspiration intensity (although not frequency), regret, and depression; and nostalgia was not significantly related to positive activated or positive deactivated affect. In summary, individuals who were prone to nostalgia reported low levels of well-being, but they also reported higher levels of empathy and inspiration intensity.

Next, we wanted to contrast these correlations with the relationships between nostalgia measured with the Southampton Nostalgia Scale and other variables. A subsample of participants completed the PINE and SNS measures. Before examining these comparisons, we first conducted separate confirmatory factor analyses to examine model fit of the PINE and SNS measures. The data were not multivariate normal for either scale as indicated by Mardia's tests of skewness (PINE: $\hat{\gamma}_{1,p} = .69$, $p < .001$; SNS: $\hat{\gamma}_{1,p} = 7.71$, $p < .001$) and kurtosis (PINE: $\hat{\gamma}_{2,p} = 30.22$, $p < .001$; SNS: $\hat{\gamma}_{2,p} = 82.75$, $p < .001$), so we used a maximum likelihood estimator with robust standard errors (Yuan & Bentler, 2000). Fit indices for the PINE scale showed excellent model fit, $\chi^2(2) = 2.47$, $p = .29$; RMSEA = .026, 90% CI [.000, .112]; CFI = 1.000; SRMR = .007. In contrast, the SNS showed unacceptable model fit, $\chi^2(14) = 107.60$, $p < .001$; RMSEA = .212, 90% CI [.175, .250]; CFI = .898; SRMR = .061.

Finally, we compared the strengths of the relationships between these two nostalgia scales and a subset of the available individual difference measures. The correlations were compared using William's test because the pairs of dependent correlations shared one variable (Steiger, 1980; Williams, 1959). The PINE and SNS measures were positively related, $r(228) = .66$, $p < .001$. As can be seen in Table 2, there were a few differences between the correlations involving the PINE scale and the correlations involving the SNS. For example, approach temperament was not significantly related the PINE scale but it was significantly related to SNS, and these correlations were significantly different. In terms of the Big 5, the pattern of relations was similar for agreeableness, conscientiousness, and neuroticism. However, extraversion was slightly positively related to SNS but was slightly negatively related to the PINE scale. Although neither correlation was significant, the difference between these correlations was significant. Similarly, openness to experience was positively related to SNS but was not related to the PINE scale.

Individuals who reported high levels of SNS also reported higher levels of inspiration, satisfaction with life, meaning in life (both presence and search), and lower levels of depression in comparison with individuals who reported high levels of nostalgia on the PINE scale. In an attempt to understand why the SNS was more positively related to well-being than the PINE, we considered the approach-oriented wording of several of the SNS items (e.g., "How important is it for you to bring to mind nostalgic experiences?", "Generally speaking, how often do you bring to mind nostalgic experiences?"). Pursuing and seeking nostalgic experi-

Table 2
Correlation Comparisons Between the PINE Scale and the SNS

Variable	N	Correlation with PINE r	Correlation with SNS r	Correlation comparison t
Approach	231	.03	.23**	−3.72***
Avoidance	231	.22**	.25***	−.70
Agreeableness	174	.10	.16*	−1.06
Conscientiousness	174	−.07	.06	−1.99*
Extraversion	174	−.10	.11	−3.43**
Neuroticism	174	.23**	.21**	.20
Openness	174	.02	.24**	−3.72***
Satisfaction with life	232	.02	.13†	−2.06*
Meaning in life (presence)	231	−.04	.09	−2.43*
Meaning in life (search)	231	.23**	.34***	−2.20*
Regret	232	.29***	.26***	.67
Depression	113	.29**	.14	2.03*
Inspiration frequency	232	.12†	.28***	−3.19**
Inspiration intensity	232	.14*	.31***	−3.24**
Inspiration aggregate	232	.14*	.32***	−3.46**

Note. PINE = Personal Inventory of Nostalgic Experiences; SNS = Southampton Nostalgia Scale.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

ences is different from simply feeling nostalgic, which could explain why the SNS was positively related to approach motivation and the PINE was not. After controlling for approach motivation in multiple regression analyses with standardized coefficients, we found that the relationships between SNS and satisfaction with life, $\beta = .06$, $t = .91$, $p = .37$, presence of meaning in life, $\beta = .00$, $t = .07$, $p = .95$, and depression, $\beta = .27$, $t = 2.86$, $p < .01$, were more similar to the relationships between PINE and those respective well-being measures, $\beta = .01$, $t = .11$, $p = .92$; $\beta = −.06$, $t = .91$, $p = .37$; $\beta = .31$, $t = 3.53$, $p < .001$, respectively.

In summary, these findings show that, between-individuals, the nomological net of nostalgia as measured with the PINE scale is more negative than previously suggested by the results from trait correlations involving the SNS (Routledge et al., 2011; Stephan et al., 2014).

Study 3: Daily States of Nostalgia

After establishing good psychometric properties of the PINE scale and after examining the between-person nomological net of nostalgia, we sought to measure nostalgia as it occurred in daily life in an ecologically valid context. To do so, participants completed end-of-the-day reports about their daily experiences, state of well-being, thoughts, and how nostalgic they felt that day. This type of study can advance our understanding of nostalgia by showing what types of events and experiences are likely to occur on days when one feels nostalgic. It also allows for the examination of within-person relationships between nostalgia, well-being, and daily events. This level of analysis is mathematically independent from the between-person relationships examined in Study 2 and from between-subjects experiments involving nostalgia. Within-person relationships also address processes that are psychologically distinct from between-person relationships (Affleck, Zautra, Tennen, & Armeli, 1999).

Method

Participants and procedure. A subset of the participants from Study 2 (232 undergraduate students; $M_{age} = 19.94$, $SD = 1.68$, 82.3% female) signed up for the study in exchange for research credit. Before completing daily reports, they either watched an instructional video online or participated in an online video call with one of the coauthors to learn about the procedure. They were instructed to complete a daily questionnaire administered via e-mail with a Qualtrics link just before going to bed in the evening. Over the course of 14 days, an e-mail was sent at 9:00 p.m. each evening and a reminder e-mail was sent to participants at 7:00 am the following morning if they forgot to complete the questionnaire the night before. Emails completed as late as 10:00 a.m. were accepted, consistent with previous diary studies (e.g., Oishi, Diener, Choi, Kim-Prieto, & Choi, 2007).

The diary studies were conducted in three separate semesters with different participants. Because the procedures were nearly identical and because the measures used in each sample were very similar, we aggregated participants across all three samples. Doing so minimizes the potential of capitalizing on sampling variability. Separate analyses were also calculated and differences across samples were not meaningful, so we present the aggregated analyses.

We collected 3,011 daily reports and excluded 287 entries that were either duplicate entries, completed after 10:00 a.m. the following day, or completed in less than 2 or 3 min (depending on the sample and number of questions asked). We additionally excluded data from participants who failed to correctly answer an instructed response item, (e.g., "Please select 'A moderate amount' for this question") as recommended by Meade and Craig (2012), or whose total number of valid completed entries was less than 5. This resulted in 2,724 entries (90.47%) for analysis, a percentage consistent with many diary studies (Nezlek, 2012, pp. 45–49). Participants completed an average of 11.74 of the 14 possible daily

questionnaires ($SD = 2.14$) and the minimum number of completed reports was 5.

Measures.

Daily events. Participants first answered 26 questions about events and experiences that are common in everyday life among undergraduate students. The list of events is a compilation from the Daily Event Schedule (Butler, Hokanson, & Flynn, 1994), the Objective/Subjective Event Checklist (Seidlitz & Diener, 1993), and other items from a diary study by Gable, Reis, and Elliot (2000). Events were grouped into categories of positive social (e.g., "Had especially good interactions with friend(s) or acquaintances"), positive achievement (e.g., "Completed work on an interesting project or assignment"), negative social (e.g., "Was excluded or left out by my group of friends"), and negative achievement (e.g., "Fell behind in coursework or duties"). Additionally, we created five items concerning events that would likely covary with nostalgic experiences: "Met up with a friend or acquaintance you hadn't seen in a long time," "Sent email, text, Facebook message, or communicated in some way with an old friend or acquaintance," "Heard a song that I had not heard in a long time," "Watched a movie or part of a movie (e.g., YouTube clip) that reminded me of my past," and "Saw an old photo of myself or friends (on Instagram, Facebook, text, etc.)." These five nostalgic events were administered in the third sample only. The first two items were included in the first and second samples. For each daily event, participants responded on a 5-point scale ($0 = $ *did not occur*, $1 = $ *occurred and not important*, $2 = $ *occurred and somewhat important*, $3 = $ *occurred and pretty important*, $4 = $ *occurred and extremely important*). The average score was calculated which provides a measure that captures whether an event occurred and how important the event was to the participant.

Helping behavior was measured with 10 items that assessed the extent to which they helped strangers with everyday activities (e.g., "Today, I gave directions to a stranger or acquaintance"). These items were originally adapted from the Self-Report Altruism Scale (Philippe Rushton, Chrisjohn, & Cynthia Fekken, 1981) and later consolidated and reworded for a daily diary study (Morelli, Rameson, & Lieberman, 2014). Responses were recorded on the same response scale as the daily events ($0 = $ *did not occur . . .*, $4 = $ *occurred and extremely important*).

To measure the extent to which participants engaged in social media, we created several items that were adapted from previous daily diary studies (Walters & Horton, 2015; Wenninger, Krasnova, & Buxmann, 2014). These items were meant to assess active (e.g., sending messages to a friend) and passive (e.g., viewing images of friends) participation. In the first two samples, items were worded specifically for Facebook use, whereas the items in the third sample were edited to more broadly include many forms of social media, such as Instagram. Edited items occur after the backslash. Participants were asked, "Of the time you spent on Facebook/social media today, to what extent did you engage in the following activities?" The items were: "Passively scrolling through my news feed/Passively scrolling through the feed," "Commenting on friends' posts, status updates, pictures, etc./Commenting on posts or photos," "Messaging friends/Direct messaging friends," "Updating my status/Updating my status/profile," "Uploading pictures or videos/Publishing posts or photos," "Searching through specific people's profiles or pictures/Looking at specific people's accounts," and "Playing games." Responses

were recorded on a 7-point scale ($1 = $ *not at all*, $7 = $ *a great deal*). The results across the studies did not differ meaningfully, so we combined the items for a composite score.

Nostalgia. To measure daily states of nostalgia, we asked participants to indicate the extent to which the PINE statements described them today. Items were worded in the past tense ("How nostalgic did you feel today?", "To what extent did you feel sentimental for the past?", "How much did you feel a wistful affection for the past?", "To what extent did you feel a longing to return to a former time in your life?"). Responses were recorded on a 7-point scale ($1 = $ *not at all*, $7 = $ *very much*).

Temporal thoughts. To assess convergent and discriminant validity at the daily level, we included three items to assess the extent to which participants thought about the past, present, and future each day: "Today, how often did you think about things that had occurred in the past?", "How often were you focused today on what was happening in the moment?", and "Today, how often did you think about things that are to come in your future?" These single items have been adapted from a longer trait version (Shipp, Edwards, & Lambert, 2009) and have been used reliably at the daily level (Rush & Grouzet, 2012). Responses were recorded on a 9-point scale ($1 = $ *never*, $9 = $ *constantly*).

Well-being. Similar to affect in Study 2, daily affective states were measured using a circumplex model. Participants were asked to indicate how strongly they felt each adjective today on a 7-point scale ($1 = $ *did not feel this way at all*, $4 = $ *felt this way moderately*, $7 = $ *felt this way very strongly*). The same adjectives from Study 2 were used in the diary studies. In addition to the 20 adjectives used to measure the affect circumplex, loneliness was assessed with the items alone and lonely, similar to the methods and items used to assess daily states of loneliness in previous research (e.g., Doane & Adam, 2010; Jonason, Webster, & Lindsey, 2008).

Daily states of satisfaction with life were assessed with a single item: "How satisfied were you with your life today?" Responses were recorded on a 7-point scale ($1 = $ *not at all*, $7 = $ *very much*).

Daily states of meaning in life were distinguished by the extent to which one found meaning in life (presence) and the extent to which one searched for meaning in life (search) on that day. Presence was assessed with the items, "How meaningful did you feel your life was today?" and "How much did you feel your life had purpose today?"; search was assessed with the items, "How much were you searching for meaning in your life today?" and "How much were you looking to find your life's purpose today?", similar to previous diary studies that have assessed these constructs (e.g., Newman, Nezlek, & Thrash, 2018; Steger & Kashdan, 2013). Responses were recorded on a 7-point scale ($1 = $ *not at all*, $7 = $ *very much*).

Daily states of inspiration were measured with three items that have been adapted from a trait measure to be administered at the daily level (Thrash & Elliot, 2003; Thrash, Elliot, Maruskin, & Cassidy, 2010). These items were, "Something I encountered or experienced inspired me today," "Today I felt inspired," and "Today I was inspired to do something." Responses were recorded on a 7-point scale ($1 = $ *not at all*, $7 = $ *very strongly*).

Regret was captured with three items that were adapted from a trait measure (Schwartz et al., 2002). Similar to Newman, Schug, Yuki, Yamada, and Nezlek (2018), the items were reworded at the daily level: "Whenever I made a choice today, I was curious about what would have happened if I had chosen differently," "Today,

when I thought about how I'm doing in life, I often thought about the opportunities I had passed up," and "Whenever I made a choice today, I tried to get information about how the other alternatives would have turned out." Responses were recorded on a 7-point scale (1 = *strongly disagree*, 4 = *neither agree nor disagree*, 7 = *strongly agree*).

Daily states of self-esteem were measured with four items that were adapted from Rosenberg's (1965) 10-item trait measure to reflect the daily state (Nezlek, 2005). These items were "Today, I felt like a failure," "Today, I felt that I had many good qualities," "Today, I thought I was no good at all," and "Today, on the whole, I was satisfied with myself." Responses were recorded on a 7-point scale (1 = *very uncharacteristic of me today*, 7 = *very characteristic of me today*).

Rumination and reflection were assessed with three items for each construct that were adapted from the trait measures developed by Trapnell and Campbell (1999). The rumination items were "How much today did you ruminate or dwell on things that happened to you?", "How much today did you play back over in my mind how you acted in a past situation?", and "How much today did you spend time rethinking things that are over and done with?"; the reflection items were "How much today did you think about your attitudes and feelings?", "How much today did you think about the nature and meaning of things?", and "How much today did you think introspectively or self-reflectively, i.e., about yourself and what you are like?". Because the reliability for reflection was not as high as we had hoped (.46), we removed the second item following the advice of Nezlek (2012) and practice of Newman and Nezlek (2019).

Optimism was measured with three items that were adapted and reworded from the Life Orientation Test–Revised (Scheier, Carver, & Bridges, 1994). These items were "I usually expected the best today," "Today, I was optimistic about my future," and "Overall, I expected more good things to happen to me today than bad." Responses were recorded on a 7-point scale (1 = *very uncharacteristic of me today*, 7 = *very characteristic of me today*).

Results

Overview. These data were multilevel in nature such that *i* days were nested within *j* persons. Because of this nested structure, we could not assume independence among observations, so we used multilevel modeling to differentiate between- and within-person variation. We used the program HLM 7.01 (Raudenbush, Bryk, & Congdon, 2011) for all analyses and reported unstandardized coefficients. We began by presenting descriptive statistics of each variable by providing estimates of the means, the amount of variance between- and within-individuals, and the reliability of each variable. Next, we analyzed the within-person relationships between nostalgia and daily events to understand when people were likely to feel nostalgic. We also provided convergent and discriminant validity by examining the extent to which nostalgia covaries with daily thoughts about the past, present, and future. After these models, we examined within-person relationships between nostalgia and well-being and variables relevant to well-being, such as regret, inspiration, and rumination. We built models with and without controls for negative events. Finally, we examined lagged analyses as one potential method of testing causal pathways involving nostalgia.

Descriptive statistics. To provide estimates of the means and variances, we created unconditional or null models, which means that each variable was entered as the outcome or dependent variable in separate models without any predictors. The intercept was allowed to vary randomly and the coefficient value takes into account the number of observations provided by each participant. The unconditional model also provides estimates of within- and between-person variation. These results are presented in Table 3. Nostalgia's mean was 2.69 on a 1–7 scale, and a closer examination of the distribution suggested the variable was positively skewed. On 30.6% of the days, participants reported feeling not nostalgic at all. Roughly half of the variance of nostalgia occurred within-individuals, similar to measures of affect and loneliness. The means of all of the constructs were sufficiently far away from the endpoints of the scales so ceiling effects were not an issue.

To calculate the reliability of each variable, we followed recommendations by Nezlek (2017). Three level models were created in which items were nested within days, and days were nested within persons. The intercepts of these null models provide ratios of true variance over total variance without confounding within- and between-person variation. These statistics are presented in Table 3. Notably, the reliability of the four items measuring daily states of nostalgia was reasonably high (.90).

To offer additional support of the construct validity of the trait PINE scale, we examined the correlation between the daily average nostalgia score and the trait nostalgia score. The correlation was calculated by taking the square root of the percent the between-person variance from the nostalgia null model was reduced when the PINE scale was entered as a predictor at Level 2. This percentage of reduced variance is conceptually equivalent to r^2. The square root, r, was .72, indicating reasonable validity.

Relationships between daily events/temporal thoughts and nostalgia. To understand when people were likely to experience nostalgia, we created two-level models in which days were nested within persons. Nostalgia was the outcome measure and daily events were entered group-mean centered (i.e., centered around each individual's mean) at Level 1 to control for any individual differences in these measures (Enders & Tofighi, 2007). Error terms were trimmed if the random effects were not significant, defined loosely as $p = .15$ (as recommended by Nezlek, 2012, pp. 65–68). We also added a time variable, which was group-mean centered at Level 1, to account for a possible linear trend in the data. Doing so controls for such trends without formally modeling autocorrelated error (Nezlek, 2012, p. 114–117).[1] The model was as follows:

$$\text{Day level}: y_{ij}(\text{nostalgia}) = \beta_{0j} + \beta_{1j}(\text{positive social events})$$
$$+ \beta_{2j}(\text{negative social events})$$
$$+ \beta_{3j}(\text{positive achievement events})$$
$$+ \beta_{4j}(\text{negative achievement events})$$
$$+ \beta_{5j}(\text{time}) + r_{ij}$$

---

[1] Time coefficients indicated a slight negative autocorrelation (ranging from $b = -.00$, $t = .10$, $p = .92$, to $b = -.03$, $t = 4.91$, $p < .001$), but inclusion of the time coefficient did not meaningfully change the fixed effects of primary interest (the largest change of a fixed effect was from $b = .53$, $t = 7.16$, $p < .001$, to $b = .57$, $t = 7.96$, $p < .001$).

Table 3
Descriptive Statistics for All Daily Measures for Study 3

Daily measure	No. daily reports	Intercept	Variance		Reliability
			Within	Between	
Nostalgia	2,723	2.69	1.47	1.45	.90
Daily events					
Positive social events	2,724	.88	.38	.22	
Negative social events	2,723	.31	.14	.08	
Positive achievement events	2,724	.73	.29	.15	
Negative achievement events	2,724	.62	.24	.14	
Nostalgia events	2,721	.63	.49	.17	
Social media active	2,703	1.77	.36	.41	
Social media passive	2,702	3.52	.92	1.54	
Helping	2,028	.25	.09	.07	
Temporal thoughts					
Past	2,722	3.86	3.51	1.96	
Present	2,722	5.93	3.06	2.05	
Future	2,721	5.86	3.72	2.00	
Well-being and relevant measures					
Positive activated affect	2,722	3.72	1.33	1.11	.84
Positive deactivated affect	2,722	3.66	1.13	1.01	.85
Negative activated affect	2,722	3.04	1.21	.75	.67
Negative deactivated affect	2,724	2.31	1.05	.86	.79
Loneliness	2,721	2.31	1.23	1.26	.81
Satisfaction with life	2,016	4.58	1.42	.99	
Meaning (presence)	2,723	3.76	1.46	1.53	.86
Meaning (search)	2,723	2.67	1.28	1.38	.88
Self-esteem	1,321	4.98	.93	.99	.52
Inspiration	2,721	3.19	2.00	1.17	.90
Optimism	1,321	4.30	1.24	1.45	.82
Regret	1,321	3.19	1.14	.99	.64
Rumination	695	3.02	1.46	.93	.79
Reflection	695	3.59	1.43	1.25	.63

Note. Reliability statistics were not calculated for single item measures or for daily events as we did not expect them to be internally consistent as suggested by Stone, Kessler, and Haythomthwatte (1991).

Person level:
$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + u_{2j}$$
$$\beta_{3j} = \gamma_{30} + u_{3j}$$
$$\beta_{4j} = \gamma_{40} + u_{4j}$$
$$\beta_{5j} = \gamma_{50} + u_{5j}$$

Daily states of nostalgia were positively related to negative social events, $\gamma_{20} = .30$, $t = 3.58$, $p < .001$, and negative achievement events, $\gamma_{40} = .21$, $t = 3.79$, $p < .001$, and were not significantly related to positive social events, $\gamma_{10} = .05$, $t = 1.13$, $p = .26$, or positive achievement events, $\gamma_{30} = -.00$, $t < 1$, $p = .93$. To interpret these unstandardized coefficients, as negative social events increase by 1 point on the raw scale (0 = *did not occur*, 4 = *occurred and extremely important*) for the average individual, nostalgia increases by .30 on the raw scale (1 = *not at all*, 7 = *very much*) holding all other daily events constant. That is, participants on average were likely to feel nostalgic when negative events occurred. The strengths of the relationships between nostalgia and social and achievement events were not significantly different, positive: $\chi^2(1) = .62$, $p > .5$; negative: $\chi^2(1) = .62$, $p > .5$, so we aggregated across social and achievement events to create composite positive and negative event scores. We additionally constrained the coefficients to be equal with a χ^2 based test of fixed effects. Consistent with the notion that the "bad is stronger than the good" (Baumeister, Bratslavsky, Finkenauer, & Vohs,

2001), the relationship between nostalgia and negative events, $\gamma_{20} = .53$, $t = 7.16$, $p < .001$, was stronger than the relationship between nostalgia and positive events, $\gamma_{10} = .08$, $t = 1.25$, $p = .21$; $\chi^2(1) = 18.57$, $p < .001$.

Next, we entered the nostalgic events variable as a sole predictor group-mean centered and found a positive relationship with nostalgia, $\gamma_{10} = .29$, $t = 7.27$, $p < .001$. Likewise, we found significant positive relationships between nostalgia and helping behavior, $\gamma_{10} = .27$, $t = 3.01$, $p < .01$, between nostalgia and active social media use, $\gamma_{10} = .21$, $t = 4.30$, $p < .001$, and between nostalgia and passive social media use, $\gamma_{10} = .15$, $t = 5.00$, $p < .001$. This means that people were likely to feel nostalgic when they met friends/acquaintances they had not seen in a long time, heard a song they had not heard in a while, helped others, and engaged in social media either actively or passively.

Finally, to examine convergent and discriminant validity, we assumed participants would be more likely to think about the past than the present or future when they felt nostalgic. To test this, we created a model in which nostalgia was the outcome measure and past ("Today, how often did you think about things that had occurred in the past?"), present ("How often were you focused today on what was happening in the moment?"), and future ("Today, how often did you think about things that are to come in your future?") were entered simultaneously group-mean centered at Level 1:

$$\text{Day level}: y_{ij}(\text{nostalgia}) = \beta_{0j} + \beta_{1j}(\text{past}) + \beta_{2j}(\text{present})$$
$$+ \beta_{3j}(\text{future}) + \beta_{4j}(\text{time}) + r_{ij}$$

$$\text{Person level}: \quad \beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + u_{2j}$$
$$\beta_{3j} = \gamma_{30} + u_{3j}$$
$$\beta_{4j} = \gamma_{40} + u_{4j}$$

As predicted, people were likely to feel nostalgic when thinking about the past, $\gamma_{10} = .41$, $t = 24.90$, $p < .001$, rather than the present, $\gamma_{20} = .01$, $t < 1$, $p = .38$, or future, $\gamma_{30} = .01$, $t < 1$, $p = .38$.

Relationships between nostalgia and well-being and related constructs. In the next set of models, we examined the relationships between daily states of nostalgia and various well-being measures and other relevant measures that have been linked to nostalgia in previous studies. Nostalgia was entered as a group-mean centered predictor at Level 1 and each well-being variable was entered as the outcome measure in separate analyses.

$$\text{Day level}: y_{ij}(\text{well-being}) = \beta_{0j} + \beta_{1j}(\text{nostalgia})$$
$$+ \beta_{2j}(\text{time}) + r_{ij}$$

$$\text{Person level}: \quad \beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + u_{2j}$$

As can be seen in Table 4, on days when people felt nostalgic, they also reported greater negative affect (both activated and deactivated), loneliness, regret, rumination, reflection, searching for meaning, and inspiration. On these days, they also reported less satisfaction with life and self-esteem. Nostalgia was not significantly related to positive activated affect, positive deactivated affect, presence of meaning in life, or optimism.

Given that people felt nostalgic when negative events occurred, it is possible that the negative relationships between nostalgia and well-being could be caused by negative events which would presumably lower well-being. To test this possibility, we created models in which we statistically adjusted for negative events by adding this measure as a predictor along with nostalgia at Level 1. The results of these analyses remained largely the same although the relationships between nostalgia and well-being were slightly attenuated (see Table 4). These analyses showed that the negative relationships between nostalgia and well-being cannot simply be attributed to the negative effects associated with negative events.

Lagged analyses. To provide some insight into the direction of the effects between nostalgia, daily events, and well-being, we examined 1-day lagged relationships between these measures (for a discussion of the logic of such analyses, see Nezlek, 2012, p. 111–114). We used temporal precedence as a proxy for causality (West & Hepworth, 1991) while still acknowledging the caveat that third variables could potentially explain the relationships. To test the lagged effect to nostalgia, yesterday's nostalgia and yesterday's daily events/well-being were used to predict today's nostalgia. To test the lagged effect from nostalgia, today's daily events/well-being were the outcome measure:

$$\text{Lag to nostalgia}: \gamma_{ij}(\text{nostalgia day } n)$$
$$= \beta_{0j} + \beta_{1j}(\text{nostalgia day } n-1)$$
$$+ \beta_{2j}(\text{daily event/well-being day } n-1) + r_{ij}$$

$$\text{Lag from nostalgia}: \gamma_{ij}(\text{daily event/well-being day } n)$$
$$= \beta_{0j} + \beta_{1j}(\text{nostalgia day } n-1)$$
$$+ \beta_{2j}(\text{daily event/well-being day } n-1) + r_{ij}$$

In the first set of models, yesterday's loneliness, $\gamma_{20} = .05$, $t = 2.00$, $p < .05$, was positively related to today's nostalgia, and yesterday's active social media use, $\gamma_{20} = -.11$, $t = 2.15$, $p < .05$, was negatively related to today's nostalgia. Reverse lagged effects involving these variables were not significant (all ts < 1.13, ps $> .25$). This suggests that loneliness leads people to feel more nostalgic on the following day, and active social media use leads people to feel less nostalgic the following day. In the second set of models, yesterday's nostalgia was positively related to today's negative events, $\gamma_{10} = .02$, $t = 2.34$, $p = .02$; $\gamma_{10} = .02$, $t = 2.60$, $p = .01$ (both social and achievement, respectively), thinking about the past, $\gamma_{10} = .14$, $t = 2.67$, $p < .01$, and rumination, $\gamma_{10} = .17$, $t = 2.46$, $p < .05$, and was negatively related to PD, $\gamma_{10} = -.05$, $t = 2.02$, $p < .05$. Reverse lagged effects were not significant (all ts < 1.46, all ps $> .14$).[2] This suggests that nostalgia could lead people to experience negative events, to think about the past more, to ruminate, and to feel less peaceful and calm on the following day. Finally, there were significant positive lagged relationships from ND to nostalgia, $\gamma_{20} = .06$, $t = 2.07$, $p < .05$, and from nostalgia to ND, $\gamma_{10} = .05$, $t = 2.20$, $p = .03$. This means that yesterday's nostalgia is likely to make one feel sad and depressed on the following day, and yesterday's sadness and depression are likely to lead one to feel more nostalgic on the following day. All other lagged relationships were not significant (all ts < 1.55, ps $> .12$). In summary, nostalgia tends to have mostly negative effects on one's well-being the following day.

Discussion

These results show that nostalgic feelings varied considerably from day to day. People were more likely to feel nostalgic when negative events occurred than when positive events occurred. They were also likely to feel nostalgic on days when they helped others, were reminded of old friendships or music, felt inspired, and engaged in social media use. Despite a few positive or mixed effects, the predominant finding was that people reported lower levels of well-being on days when they felt nostalgic, and these effects remained even after statistically adjusting for negative events. Lagged relationships also indicated that experiencing nostalgia on one day was negatively related to one's well-being on the following day.

---

[2] Because loneliness was positively related to tomorrow's nostalgia, we controlled for loneliness in the other lagged analyses. Substantive conclusions remained the same, namely that nostalgia was still significantly related to tomorrow's negative social and achievement events, thinking about the past, rumination, and PD.

Table 4

Relationships Between Nostalgia and Well-Being/Well-Being Related Variables With and Without Controlling for Negative Events

Variable	No. daily reports	Without control		With control			
		Nostalgia		Nostalgia		Negative events	
		Coefficient	t ratio	Coefficient	t ratio	Coefficient	t ratio
Positive activated affect	2,721	.00	<1	.03	1.08	−.68	7.76***
Positive deactivated affect	2,721	−.04	1.69†	−.01	<1	−.73	9.50***
Negative activated affect	2,721	.13	5.55***	.08	4.00***	1.25	15.10***
Negative deactivated affect	2,723	.20	8.13***	.16	6.98***	1.06	14.12***
Loneliness	2,720	.17	6.53***	.15	5.92***	.55	6.73***
Satisfaction with life	2,016	−.12	3.92***	−.09	2.85**	−1.06	9.64***
Meaning (presence)	2,722	−.01	<1	.01	<1	−.55	5.41***
Meaning (search)	2,722	.11	4.45***	.11	4.61***	−.06	<1
Self-esteem	1,321	−.12	4.14***	−.08	3.12**	−.85	8.78***
Inspiration	2,721	.11	3.69***	.13	4.41***	−.48	5.04***
Optimism	1,321	−.02	<1	−.00	<1	−.54	5.01***
Regret	1,321	.18	6.32***	.17	5.70***	.38	4.76***
Rumination	695	.49	9.84***	.48	9.98***	.75	5.13***
Reflection	695	.36	7.17***	.34	6.99***	.48	3.27**

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Study 4: Momentary States of Nostalgia

Study 3 showed that everyday nostalgia relates negatively to well-being, in contrast to the positive effects of nostalgia observed in experimental laboratory studies. This observed discrepancy could be because of differences in the measurement of nostalgia and/or differences in the extent to which nostalgia has been measured or manipulated in ecologically valid contexts. Alternatively, this discrepancy could be because of differences in the questionnaire reporting period. In the experimental studies, nostalgia was manipulated and the dependent variable was measured either immediately or within a few minutes of the manipulation. In contrast, participants in Study 3 were asked to reflect on their entire day. It is possible that nostalgia has immediate positive benefits but that these effects dissipate relatively quickly. If so, the benefits of nostalgia may not be captured by end-of-day diaries because they may dissipate before participants complete their diaries.

To address the latter possibility, we conducted an ecological momentary assessment study in which participants completed reports of how nostalgic they felt at randomly selected moments during the day; thus, shrinking the temporal distance between experience and report. Random selection of time points throughout the day aims to capture a representative sample of the larger population of time points in participants' current lives (Shiffman et al., 2008). If nostalgia has an immediate positive effect, people should report high levels of well-being at moments when they feel nostalgic. Alternatively, if the positive effects of nostalgia are limited to extreme and memorable episodes, positive within-person relationships between momentary nostalgia and momentary well-being should not be observed in EMA data, which privilege the more modest experiences of daily life.

Method

Study 4 was approved by the Institutional Review Board at the University of Southern California under the ID UP-17–00143 (EMA nostalgia).

Participants and procedure. There were 79 undergraduate students who signed up for the study in exchange for research credits. Participants initially completed a questionnaire containing a few brief personality measures (nostalgia, meaning in life questionnaire, neuroticism) and some demographics. The questionnaire also contained instructions about the procedure of the study and how to download the Personal Analytics Companion (PACO) app on their mobile phone (Evans, 2016).

Notifications were sent to the participant via the PACO app at eight random times during the day from 9:00 a.m. until 10:00 p.m. Each notification occurred at least 45 min after the previous notification. After receiving the notification, participants could open their app and complete a short questionnaire. Consistent with the practice of a recent EMA study (Hofmann, Wisneski, Brandt, & Skitka, 2014), the notifications were accepted up until 2 h after the notification was sent. Participants received notifications each day for 7 days so that both weekday and weekend days could be represented.

Seven participants decided to drop out of the study after signing up or after completing just a few responses because of scheduling issues or for unknown reasons. Two other participants completed less than 40% of the notifications. Data were analyzed from 70 participants (M_{age} = 20.53, SD = 1.63, 75.71% female) who completed 2,922 momentary reports. On average, participants completed 41.74 (75.3%) responses (SD = 7.79, minimum percentage was 44.64%).

Measures. At each notification, participants answered three questions about where they were, what they were doing and who they were with. Next, they completed eight items about their emotional states, and individual items about how nostalgic they felt, how meaningful they found their lives at the moment, and how optimistic they felt about their life at the moment.

The goal in asking the three questions about the activity of the participant was to capture a broad sense of what activities covary with momentary states of nostalgia. Given that this was the first study to assess nostalgia in the moment, we thought such questions

would be informative. We realize that these questions are not comprehensive in capturing all possible situations, as is the goal of questionnaires such as the DIAMONDS (Rauthmann et al., 2014), Riverside Situational Q-Sort (e.g., Sherman, Nave, & Funder, 2010), or CAPTION (Parrigon, Woo, Tay, & Wang, 2017). Because such questionnaires require many items, we opted instead for a brief set of three items to capture the activity of the participant.

The first question asked, "Where are you right now?" with the following options: Home/dorm/apartment, At a friend's place, School, Traveling, and Other. The second question asked, "What are you doing right now?" with the options: Working/studying, Eating, Exercising, Traveling, and Other leisure. The third question asked, "Who are you with?" with the following options: Friends, Coworkers/classmates, Family, Strangers, and Alone. For each question, the response options were not mutually exclusive; that is, participants were allowed to select multiple options.

Following the questions about the participants' activity, questions regarding well-being were included to capture some of the corresponding well-being related measures that have been used in laboratory settings, such as positive affect (Wildschut et al., 2006), meaning in life (Routledge et al., 2011), and optimism (Cheung et al., 2013). Therefore, we included single items to measure meaning in life ("How meaningful do you find your life right now?") and optimism ("How optimistic do you feel about your life right now?"). In terms of emotions, rather than focusing exclusively on positive affect, we additionally included negative affect items. Similar to the daily diary studies, we relied on an affective circumplex model and used two items for each quadrant by selecting items that had high factor loadings from the previous studies. Positive activated affect was assessed with excited and enthusiastic; positive deactivated affect was assessed with calm and relaxed; negative activated affect was assessed with tense and stressed; negative deactivated affect was assessed with depressed and sad. Participants were asked, "How [emotion adjective] do you feel right now?" The single item for nostalgia was, "How nostalgic do you feel right now?" Participants answered each item by responding on a 7-point scale (1 = *not at all*, 7 = *very much*).

Results

Overview. To account for the nested data structure, we used multilevel modeling. In most of the models, we nested moments within days, and days were nested within persons to account for between-person variation, within-person between-day variation, and within-person within-day variation. In the preliminary models, we examined the reliabilities of the affect items. We also ran basic descriptive statistics and unconditional models to understand how much variation of each construct occurred at each level of analysis. In the first primary set of models, we examined the relationships between nostalgia and momentary activities in an exploratory manner to understand which types of activities were most likely to covary with momentary states of nostalgia. In the second primary set of analyses, we examined the within-person relationships between momentary states of nostalgia and momentary states of affect, meaning in life, and optimism. Finally, we examined lagged analyses to determine what type of short-term effects nostalgia had on affect, meaning in life, and optimism.

Descriptive statistics. Reliability analyses for the affect measures were conducted by nesting items within moments, and moments within persons. A response variable at the item level was the dependent variable in unconditional models. Similar to the reliability analyses from the diary studies, the reliability estimate of the intercept provides an estimate of the true variance over total variance, a classic definition of reliability. This method of calculating reliability does not confound between- and within-person variation as Cronbach's alpha would (Nezlek, 2017). The reliabilities of the affect measures were .75 or higher. All other measures were assessed with a single item and their reliability estimate could not be calculated.

To provide estimates of how much variation of each construct occurred at each level of analysis, unconditional models were run in which moments were nested within days, and days were nested within individuals. See Table 5 for the descriptive statistics. More than half of the variation for nostalgia, meaning in life, and optimism occurred between individuals. Of the within-person variation, more than half occurred within-day as opposed to between-day. For PA, PD, and NA, more variation

Table 5
Descriptive Statistics of Variables in Study 4 and Within-Person Relationships Between Momentary Nostalgia and Momentary Well-Being After Adjusting for a Linear Time Trend

Variable	Reliability	Unconditional model intercept	Variation			Within-person relationships	
			Between-person	Within-person			
				Between-day	Within-day	Coefficient	t ratio
Nostalgia		2.25	1.73	.19	.79		
Meaning in life		4.09	1.24	.19	.57	.04	1.50
Optimism		4.34	1.14	.22	.64	.04	1.49
Positive activated affect	.79	3.41	.73	.37	1.16	.05	1.32
Positive deactivated affect	.80	4.02	.63	.37	1.11	.01	<1
Negative activated affect	.75	2.78	.69	.57	.97	.01	<1
Negative deactivated affect	.78	1.91	.78	.29	.50	.16	5.44***

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

occurred within-individuals within-day than either within-individuals between-day or between-individuals. About half of the variation for ND occurred between-individuals and about a third of the variation occurred within-individuals within-day. These results suggest that sufficient within-individual within-day variation occurred to examine within-person relationships between momentary states of nostalgia and well-being related constructs.

The distribution of nostalgia was positively skewed. Participants reported feeling not at all nostalgic 51.67% of the total moments.

Relationships between nostalgia and momentary events. To understand when participants felt nostalgic, we created models involving the type of activity, the location of the participant, and the type of people the participant was with. Because these variables were not mutually exclusive, we created dummy codes for each answer to specify whether the person was or was not engaged in a particular activity. Each dummy code was entered uncentered into the model at Level 1, and the Level 1 intercept was dropped. This meant that the coefficient for each dummy code represented the mean levels of nostalgia for each activity. These coefficients were then constrained with a χ^2 based test of fixed effects to determine whether these coefficients differed significantly. A variable representing the occasion of measurement was entered group-mean centered to control for mean level changes in the outcome within each day.[3]

$$\text{Momentary level:} \quad y_{ijk}(\text{nostalgia})$$
$$= \pi_{1jk}(\text{activity present dummy code})$$
$$+ \pi_{2jk}(\text{activity absent dummy code})$$
$$+ \pi_{3jk}(\text{time}) + e_{ijk}$$

$$\text{Day level:} \quad \text{activity present:} \ \pi_{1jk} = \beta_{10k} + r_{1jk}$$
$$\text{activity absent:} \ \pi_{2jk} = \beta_{20k} + r_{2jk}$$
$$\text{time:} \ \pi_{3jk} = \beta_{30k} + r_{3jk}$$

$$\text{Person-level:} \quad \text{activity present:} \ \beta_{10k} = \gamma_{100} + u_{10k}$$
$$\text{activity absent:} \ \beta_{20k} = \gamma_{200} + u_{20k}$$
$$\text{time:} \ \beta_{30k} = \gamma_{300} + u_{30k}$$

Participants were more likely to feel nostalgic when they were eating ($\gamma = 2.35$), with friends ($\gamma = 2.30$), and with family ($\gamma = 2.64$) than when they were not eating ($\gamma = 2.23$), not with friends ($\gamma = 2.22$), and not with family ($\gamma = 2.21$), $\chi^2(1) = 4.50, p < .05$; $\chi^2(1) = 2.89, p = .08$; $\chi^2(1) = 7.94, p < .01$, respectively. They were less likely to feel nostalgic when they were at school ($\gamma = 2.13$), working/studying ($\gamma = 2.16$), or with coworkers/classmates ($\gamma = 2.04$) than when they were not at school ($\gamma = 2.28$), not working/studying ($\gamma = 2.29$), and not with coworkers/classmates ($\gamma = 2.29$), $\chi^2(1) = 14.75, p < .001$, $\chi^2(1) = 6.78, p < .01$; $\chi^2(1) = 21.15, p < .001$, respectively. All other contrasts were not significant ($ps > .25$).

Relationships between momentary nostalgia and well-being. Next, we examined the within-person relationships between momentary states of nostalgia and meaning in life, optimism, and affect. Nostalgia was entered group-mean centered as a Level 1 predictor to account for any individual differences in nostalgia, and each of the other variables were entered separately as outcome measures. A time variable representing the occasion of measurement was also entered group-mean centered to control for mean level changes in the outcome within each day.

$$\text{Momentary level:} \quad y_{ijk}(\text{well-being}) = \pi_{0jk} + \pi_{1jk}(\text{nostalgia})$$
$$+ \pi_{2jk}(\text{time}) + e_{ijk}$$

$$\text{Day level:} \quad \text{intercept:} \ \pi_{0jk} = \beta_{00k} + r_{0jk}$$
$$\text{nostalgia:} \ \pi_{1jk} = \beta_{10k} + r_{1jk}$$
$$\text{time:} \ \pi_{2jk} = \beta_{20k} + r_{2jk}$$

$$\text{Person-level:} \quad \text{intercept:} \ \beta_{00k} = \gamma_{000} + u_{00k}$$
$$\text{nostalgia:} \ \beta_{10k} = \gamma_{100} + u_{10k}$$
$$\text{time:} \ \beta_{20k} = \gamma_{200} + u_{20k}$$

As can be seen in Table 5, nostalgia was positively related to ND but was not significantly related to any of the other affect variables, meaning in life, or optimism. That is, when participants felt nostalgic, they were also likely to feel depressed and sad.

Although nonsignificant results do not mean that no effect exists, it is possible to compare the strengths of the relationships between (a) nostalgia and ND and (b) nostalgia and other well-being variables. Doing so would provide more conclusive evidence that the main relationship worth paying attention to is the relationship between nostalgia and ND. Stated in other words, a demonstration that certain relationships are significant while others are not significant provides some useful information. Demonstrating that the significant relationship with ND is significantly stronger than the relationships with other variables strengthens the argument that nostalgia is more likely to covary with momentary negative states than positive ones.

To compare the strengths of these relationships, we "stacked the data" by creating an item level file in which a response variable alternated between ND and one of the other well-being variables. A similar technique was described by Bauer, Preacher, and Gil (2006) to compare direct and indirect effects simultaneously in multilevel mediation analyses. In our models, items were nested within moments, moments were nested within days, and days were nested within persons in a four-level model. Dummy codes at Level 1 for ND and the other respective well-being variable were entered uncentered, and the Level 1 intercept was dropped. Nostalgia was entered group-mean centered at Level 2, and the coefficient between nostalgia and ND was constrained to the coefficient between nostalgia and the other well-being construct. The strength of the relationship between nostalgia and ND was stronger than the relationships between nostalgia and meaning in life, $\chi^2(1) = 7.44, p < .01$; optimism, $\chi^2(1) = 5.43, p < .05$; PA, $\chi^2(1) = 8.77, p < .01$; and PD, $\chi^2(1) = 13.69, p < .001$. In summary, the positive relationships between nostalgia and meaning in life, optimism, and PA were not only small and nonsignificant; they were significantly weaker than the relationship between nostalgia and ND.

Lagged analyses. Finally, to examine any short-term effects that nostalgia may have on well-being, we ran lagged analyses. In such models, the amount of time between measurements are assumed to be roughly equal, an assumption that is easily met in daily diary studies but not in EMA studies that intentionally schedule notifications at random times. Therefore, we created

---

[3] Time occasion coefficients included positive and negative values (ranging from $b = -.0004, t = 4.35, p < .001$, to $b = .0006, t = 4.40, p < .001$), but inclusion of the time occasion coefficient did not meaningfully change the fixed effects of primary interest (the largest change of a fixed effect was from $\chi^2(1) = 17.33, p < .001$, to $\chi^2(1) = 21.15, p < .001$).

subsets of the data that included responses recorded within certain similar amounts of time. These subsets included responses within 90, 120, and 180 min of a previous response, as well as responses between 0 and 59 min, between 60 and 119, and between 120 and 179 min of a previous response. Doing so obviously lowered the number of observations which lowers statistical power and representativeness of the time points. Therefore, following the recommendations of Bolger, Stadler, and Laurenceau (2012), we conducted power analyses using MPlus V8 (Muthén & Muthén, 2017) by running simulations based on the parameters obtained from the same-moment within-person relationships presented above. Assuming an estimated within-person correlation of $r = .30$ (a medium effect size by standard conventions), only the time windows of 0–120 and 0–180 following a previous response yielded power estimates close to or above the recommended value of .80 (.77 and .81, respectively). Hence, these time frames were used in the analyses.

The lagged analysis models were created similarly to the ones in Study 3. In the models with responses that occurred within 120 min of the previous response ($n = 1,467$), there were no significant relationships between nostalgia and meaning in life, optimism, or any affect measure (all ts < 1.47, ps > .14). In the models with responses that occurred within 180 min of the previous response ($n = 1,965$), nostalgia at time $n - 1$ was positively related to PA at time n, $\gamma = .10$, $t = 2.58$, $p = .01$, and was negatively related (marginally) to PD at time n, $\gamma = -.08$, $t = 1.85$, $p = .065$. All other lagged relationships were not significant (all ts < 1.43, ps > .15). Potential third variable critiques aside, this suggests that nostalgia could increase feelings of excitement and enthusiasm up until roughly 3 h later, but it also decreases feelings of calm and relaxation during this same time window.

Discussion

Nostalgia varied considerably from moment to moment during the course of the day. People reported feeling nostalgic when they were eating, with friends, and with family, and they reported feeling less nostalgic when they were at school, working/studying, or with coworkers/classmates. Critical to our main hypothesis, people were likely to feel depressed and sad when they felt nostalgic. Momentary nostalgia did not covary significantly with positive affect, meaning in life, or optimism. Lagged relationships were mostly nonsignificant with the exception that people were likely to feel greater PA and lower PD up to 3 h later. In contrast to experimental studies that showed momentary positive effects of recall-induced nostalgia on well-being, nostalgia was negatively related to concurrent well-being when measured in ecologically valid contexts during the course of the day.

Study 5: Comparing Recalled and Daily Nostalgic Events

The results from our diary and ecological momentary assessment studies showed that nostalgia was negatively related to well-being, whereas many experimental studies showed that nostalgia has a positive effect on well-being. To address this discrepancy, we ran a study in which participants wrote about their most nostalgic experience (similar to the Event Reflection Task) and their everyday experiences that made them feel nostalgic in daily life. As discussed in the beginning, people are likely to view their most nostalgic experiences more positively than everyday experiences of nostalgia. By definition, the "most" nostalgic experiences are likely to be more extreme, more meaningful, and more memorable. They are also more distant in time and their representation is, therefore, likely to be more stylized and stripped of tangential details than representations of very recent events (Trope & Liberman, 2010). Moreover, negative affect associated with past events fades faster than positive affect (Ritchie et al., 2006; Walker et al., 1997), increasing the likelihood that any mixed feelings that may have been experienced concurrently are lost in later reconstructions. Each of these differences predicts that studies based on recalling one's most nostalgic experience should arrive at a more positive picture of nostalgia's relationship with well-being than studies based on more recent and mundane experiences of nostalgia in everyday life.

To test this hypothesis, we asked the same participants to complete the Event Reflection Task of Sedikides and colleagues (Sedikides et al., 2015; Wildschut et al., 2006) and a 1-week daily diary study, in counterbalanced order. This allows us to assess how ratings of positivity, negativity, meaning in life, and self-esteem differ between the most nostalgic experience that participants' recall when asked to do so and the ordinary experiences of nostalgia that they record in a daily diary. In addition to analyses of participants' own ratings, we conducted content analyses to determine whether the topics described in the texts differed across recalled experiences and daily experiences.

Method

Participants and procedure. This study was approved by the Institutional Review Board at the University of Southern California under the ID UP-18–00183 (Nostalgia writing and diary experiment) and preregistered at aspredicted.org under ID #9565 (https://aspredicted.org/4ic4c.pdf). Participants were 81 ($M_{age} = 20.31$, $SD = 1.73$; 81.5% female; 43.2%) undergraduate students from the same university as the preceding studies and received course research credit. All participants completed the Event Reflection Task (Sedikides et al., 2015; Wildschut et al., 2006) and a 1-week daily diary study. They were randomly assigned to complete either the Event Reflection Task first ($n = 43$) or the diary study first ($n = 38$). Two days before the first daily questionnaire was administered, all participants received an e-mail with a Qualtrics link that included either the Event Reflection Task and a few demographic questions or demographic questions only. The 1-week diary study procedure was identical to the procedure in Study 3. Two days after the final diary questionnaire was distributed, all participants received another e-mail with a link to a questionnaire that contained either the Event Reflection Task and a few demographic questions or the demographic questions only. All participants completed the Event Reflection Task only once.

Data cleaning was conducted in a similar manner as Study 3. Responses that were completed after 10:00 a.m., duplicate responses, and responses that failed to correctly answer an instructed response item were eliminated from final analyses. Participants who completed less than three valid daily questionnaires were also eliminated. Of the initial 535 daily questionnaires, 484 were retained for final analyses (90.47%); 81 of the initial 90 (90.0%) participants remained as well. They completed an average of 5.98

of the seven possible daily questionnaires (*SD* = 1.11, median = 6, minimum = 3).

Measures. The Event Reflection Task materials were copied from Sedikides et al. (2015; initially created by Wildschut et al., 2006). Participants were shown a definition of nostalgia and were then asked to think of a past event that makes them feel most nostalgic. They were asked to write four keywords relevant to this nostalgic event and were then asked to describe the experience and how it made them feel in a text box. On the following screen, they were asked, "How positive was this experience for you?" and "How negative was this experience for you?" on 7-point scales (1 = *not at all positive*, 7 = *very positive*; 1 = *not at all negative*, 7 = *very negative,* respectively). Next, meaning in life, self-esteem, and nostalgia were measured as states with items that were slightly reworded from the daily items from Study 3. For example, meaning in life items were, "How meaningful do you feel your life is right now?" and "How much do you feel your life has purpose right now?" A few demographic questions followed.

The daily questionnaires included questions about daily events, affect, nostalgia, meaning in life, self-esteem, satisfaction with life, and the past, present, and future that were same as Study 3. Participants who reported some level of nostalgia (by endorsing a value greater than "not at all" for any of the four items) were asked to think about the experience that made them feel nostalgic today. They were asked to write down four keywords relevant to this nostalgic event, and on the next page they were asked to describe the experience and how it made them feel today. These instructions were the same as those from the Event Reflection Task but reworded to make sense for the daily nature of the questionnaire. If the participant reported feeling not at all nostalgic for all four items, they were asked to think about an ordinary experience today. Similarly, they were asked to write down four keywords relevant to the ordinary event, and on the next page they were asked to describe the experience and how it made them feel today. Similar to the Event Reflection Task questionnaire, participants were asked how positive and negative this experience was to them with the exact same wording and response scale.

Results

Event reflection task and diary comparisons. Of interest is whether the same person reports differential subjective experiences after thinking about a past event that made them feel most nostalgic (the wording of the ERT instructions) than after describing a recent everyday event for which they indicated nostalgic feelings. To address this issue, we first compared the mean ratings, within-individuals, of nostalgia, positivity, negativity, meaning in life, and self-esteem between the Event Reflection Task and daily reports. Because daily reports were nested within individuals, we used multilevel modeling. Each daily score was subtracted from that specific individual's respective ERT score to create a new difference score variable. This difference score variable was entered as the outcome variable in an unconditional model (i.e., no predictors at Levels 1 or 2). The intercept coefficient provides an estimate of the difference between the ERT score and the average daily scores while taking the nested data structure into account.

Average ERT and daily scores aggregated across conditions (completing the ERT portion before vs. after completing the diary portion) are presented on the left side of Table 6 and statistical comparisons of the means obtained from the intercept coefficients are presented on the right side of Table 6. Average daily reports come from unconditional models. Interaction effects were tested by adding a dummy-coded predictor uncentered at Level 2 to determine whether the condition (order of completing ERT and diaries) influenced the difference between ERT and daily scores. Interaction coefficients were not significant with the exception of the effect for nostalgia between ERT and daily nostalgia, *b* = .94, *t* = 2.81, *p* < .01, and marginally for self-esteem between ERT nostalgia and ordinary reports, *b* = −.52, *t* = 1.81, *p* = .08. Main effects within each group were significant and in the same direction, so we collapsed across conditions.

Consistent with our hypothesis, participants reported higher nostalgia, positivity, and meaning in life and lower negativity during the ERT than during daily nostalgic reports. Self-esteem levels did not differ significantly, however. Daily positivity, negativity, meaning in life, and self-esteem scores were not significantly different between daily nostalgia and daily ordinary expe-

Table 6
Averages of Event Reflection Task and Diary Ratings, and Comparisons of the Averages in Study 5

Variable	Averages			ERT vs. nostalgic days		ERT vs. ordinary days		Nostalgic days vs. ordinary days	
	ERT (*n* = 81)	Nostalgic days (*n* = 278)	Ordinary days (*n* = 206)	*b*	*t*	*b*	*t*	*b*	*t*
Nostalgia	4.61	3.14	1.00	1.57	9.11***				
Positivity	5.95	5.02	4.81	.92	4.53***	1.21	5.18***	.23	1.26
Negativity	1.99	2.47	2.49	−.42	2.21*	−.63	3.34**	−.06	<1
Meaning in life	5.40	4.79	4.62	.61	4.66***	.87	6.28***	.16	1.44
Self-esteem	5.44	5.25	5.32	.11	<1	.22	1.51	−.07	<1
RA longing for the past	.34	.27	.09	.07	3.84***	.25	16.96***	.18	16.51***
RA positive affect	.27	.22	.14	.06	2.98**	.13	7.38***	.08	7.03***
RA negative affect	.08	.07	.08	.01	<1	−.00	<1	−.01	1.36

Note. ERT = Event Reflection Task; RA = research assistant coding. Nostalgic days refer to days when participants reported a daily nostalgic score greater than 1. Ordinary days refer to days when they reported nostalgic scores of 1 (*not at all*). Nostalgia scores on ordinary days had no variance so those models did not converge, nor were they necessary.
† *p* < .10. * *p* < .05. ** *p* < .01. *** *p* < .001.

riences. In short, daily nostalgic experiences were no more or less positive than ordinary daily experiences but were less positive and more negative than recalled nostalgic experiences under ERT instructions.

Content coding. To shed more light on these differences, research assistants who were blind to the purpose of the study provided content coding of each written text. Drawing on a previous content analysis by Hepper and colleagues (Hepper et al., 2012, 2014), we used 35 categories of nostalgia that represent associations people have with nostalgia. Two research assistants reported whether each of the 35 categories was present in the text (1 = present, 0 = absent). To simplify the analyses, we organized the 35 categories into three groups according to factor analyses performed by Hepper et al. (2014): longing for the past (e.g., longing/yearning, fond memories), positive affect (e.g., happiness, comfort/warmth), and negative affect (e.g., sadness/depressed, pain/anxiety). A score of .40, for example, indicates that 40% of the categories in that particular group were present in those written texts. Intraclass correlation coefficients (ICCs) of coders' ERT ratings were reasonably high (.71, .45, and .72, for longing for the past, positive affect, and negative affect, respectively), as were the reliabilities of the coders' daily ratings (.64, .51, and .66 for longing for the past, positive affect, and negative affect, respectively), so we aggregated across coders' ratings.

Consistent with the subjective reports, participants' descriptions of ERT nostalgic experiences contained higher percentages of material categorized as longing for the past and positive affect than their descriptions of daily nostalgic experiences (see bottom of Table 6). There were no significant differences in negative affect.

Discussion

Given the discrepancies between the findings of previous experimental studies and our diary (Study 3) and EMA (Study 4) studies, Study 5 assessed how the event that people recall when asked to describe the most nostalgic experience they can remember compares with the, presumably more ordinary, events people recall in daily diaries. Not surprisingly, the daily nostalgic events differed from the most nostalgic experiences people could remember: what the same participants recorded in their daily diaries was less positive and more negative than what they recalled about the most nostalgic experience they could remember. This suggests that the positive effects of nostalgia on well-being observed in experiments (Sedikides et al., 2015) can be attributed in part to the highly positive nature of the recalled nostalgic experiences. In daily life, nostalgia seems more mundane, less intense, and less beneficial.

General Discussion

The purpose of these five studies was to measure nostalgia in ecologically valid contexts to understand how nostalgia relates to daily experiences, feelings, and thoughts. To accomplish this, we first created and validated a trait-version of the Personal Inventory of Nostalgic Experiences scale. When assessed as a trait measure (i.e., between-persons), nostalgia-prone people generally reported lower well-being than people who were less nostalgia-prone. We found that nostalgia was positively related to negative affect, regret, and depression; nostalgia was negatively related to satisfaction with life, presence of meaning in life, and self-esteem.

Nostalgia-prone individuals also reported relatively high levels of avoidance motivation, neuroticism, thinking about the past in a negative manner, and thinking about the present in a fatalistic manner. Not all relationships were negative, however; nostalgia was positively related to thinking of the past in positive ways, thinking of the present in hedonic ways, and empathy. Thus, although most associations involving nostalgia and well-being were negative, we found some support for the notion that nostalgia is a mixed emotion as suggested by previous findings (e.g., Sedikides et al., 2015).

When assessed repeatedly in daily life, there was considerable within-person variation in nostalgic states, similar to other measures of affect. At a within-person level of analysis, people were more likely to feel nostalgic on days that included negative social and achievement events than on days that included positive social and achievement events. Nostalgia was also negatively related to daily and momentary states of well-being, and these relationships were not explained by the occurrence of daily negative events. Lagged analyses also showed that nostalgia was either negatively related, not significantly related, or both positively and negatively related to well-being at a later moment in time or on the following day.

Although most within-person analyses showed that nostalgia was negatively related to well-being and daily events, it is important to note a few positive or neutral relationships. People were more likely to feel nostalgic on days when they helped others, felt inspired, were engaged in social media, heard songs they had not heard in a long time, or communicated in some manner with an old friend/acquaintance, and searched for meaning in life. At a momentary level, people were more likely to feel nostalgic when they were eating and with friends and family. In combination, the results from between- and within-person levels of analysis indicate that nostalgia is a mixed emotion, albeit one that is more strongly and consistently associated with negative than with positive affect.

This conclusion, based on assessments of everyday nostalgic experiences in ecologically valid contexts, is opposite to the conclusions drawn from experimental studies that induced nostalgia through recall tasks (Sedikides & Wildschut, 2018; Sedikides et al., 2015). One likely reason for this discrepancy is that the experimental studies encouraged the recall of extreme nostalgic experiences, which are more positive and less negative than the ordinary experiences of nostalgia in everyday life, as indicated by the within-person comparisons of Study 5. Similarly, studies that used preselected stimuli to induce nostalgia have relied mostly on positive stimuli (e.g., Barrett et al., 2010; Routledge et al., 2011), which may highlight the positive aspects of nostalgia. Hence, the conclusion that nostalgia is predominantly positive, and related to positive well-being outcomes (Sedikides et al., 2015), may be limited to positive instances of nostalgia, which these procedures selectively privilege. The observation does not hold up with more representative samples of everyday nostalgic experiences captured with EMA (Study 4) or daily diaries (Studies 3 and 5): daily experiences that trigger nostalgic feelings are less positive than the experimental literature suggests and relate negatively (or less positively) to well-being.

In combination, this suggests that the affect and well-being outcomes associated with nostalgia may depend on the nostalgia eliciting event: positively colored nostalgic experiences are beneficial, but many, if not most, moments of nostalgia in everyday life

have a more negative flavor. If so, deliberately engaging in the recollection of extremely nostalgic moments may be beneficial, paralleling the results of experiments that prompt such deliberative recollections (e.g., Routledge et al., 2011; Wildschut et al., 2006). Reliving nostalgic moments may enhance well-being and buffer against adverse effects of negative experiences as suggested by experimental findings (e.g., Zhou et al., 2008). On the other hand, involuntarily experiencing nostalgia that is elicited by situational cues may be predominantly negative, as indicated by the EMA (Study 4) and diary (Studies 3 and 5) findings.

The proposed distinction between the deliberate and involuntary experience of nostalgia also received some support when nostalgia was measured as an individual difference (Study 2). The SNS contains several items that reflect an active, nostalgia seeking experience (e.g., "Generally speaking, how often do you bring to mind nostalgic experiences?"), whereas the PINE does not. Paralleling the differences between experimental studies and EMA and diary studies, the SNS is positively associated with well-being, whereas the PINE is negatively associated with well-being. In addition, the SNS was also positively associated with approach motivation, whereas the PINE was not significantly related to approach motivation. These observations are consistent with the notion that actively pursuing nostalgia may have positive effects on well-being, whereas involuntarily experiencing nostalgia because of contextual influences may have negative effects on well-being. Future research may fruitfully test these conjectures.

Taking a step back, it is worth remembering Joe McGrath's (1982, p. 70) admonition that "all research strategies and methods are seriously flawed." Reliance on multiple methodologies can attenuate the problem by providing multiple complementary perspectives. Experiments excel at addressing what can occur (e.g., "Can nostalgia increase meaning in life?") and at testing a hypothesized underlying process. In contrast, diary and EMA techniques excel at addressing what typically does occur in real life (e.g., "Do people believe their lives are meaningful when they feel nostalgic?"), but provide limited insight into causality. Both types of questions are important and diverging observations enrich our understanding of a phenomenon, raising new questions for further testing.

Limitations and Future Directions

No set of studies comes without limitations. As is usually the case in nostalgia research, participants were undergraduate students in the United States, which limits generalizations across age groups but facilitates comparison with the large bulk of studies conducted with undergraduate students in the United States and the United Kingdom.

Nevertheless, in future research on nostalgia, several age-related topics would be worth considering. Do older adults feel nostalgic as often and as intensely as younger adults? Is the relationship between nostalgia and well-being consistent across age groups or does it vary? What types of daily experiences elicit feelings of nostalgia among people of various ages? Recent findings indicate that older adults are more likely to experience mixed emotions more broadly (Schneider & Stone, 2015), which might suggest that older adults would also feel nostalgic more often than younger adults. Furthermore, older adults tend to experience and recall positive emotions and experiences more than negative emotions

and experiences (Mather & Carstensen, 2005). This suggests that when older adults feel nostalgic, their recollections might be more positive than typical nostalgic recollections. Future research is needed to test such possibilities.

Relatedly, the time points that we randomly sampled were presumably representative of this particular period of our participants' lives, namely during the college years in young adulthood. One could envision a sampling design in which time periods (e.g., young adulthood, early parenthood, retirement, etc.) were randomly sampled from the larger population of time periods of people's lives. Although practically challenging, such a longitudinal design would allow researchers to learn more about which periods of life people might be likely to experience nostalgia, such as the transition from high school to college or from the end of a career to retirement.

A similar limitation is that participants were only sampled from the United States which restrains generalizability across cultures. Although people in many countries conceptualize nostalgia in similar ways (Hepper et al., 2014), the types of daily experiences associated with daily states of nostalgia may vary across cultures. The implementation of EMA studies on nostalgia in different countries or cultures could shed light on this topic.

The same-day (Study 3) and same-moment (Study 4) within-person relationships between nostalgia and daily events and well-being cannot provide causal evidence for the direction of the effects. For example, negative social events, such as being made fun of by others, might lead people to feel depressed, which could lead them to seek nostalgic memories or feelings. Although we ran 1-day lagged analyses in the diary study, some effects of nostalgia might not last until the following day. Alternatively, certain daily experiences or even repeated experiences might only affect well-being and/or nostalgia several days or weeks later. Longitudinal studies or other EMA techniques with different reporting schedules would be needed to test such possibilities.

An additional avenue for future research concerns the relationship between nostalgia and daily events that have not been considered in previous research, such as negative achievement-oriented events, such as failing an exam. Several studies have examined the positive social connectedness aspect of nostalgia (Hepper et al., 2012; Reid, Green, Wildschut, & Sedikides, 2015; Wildschut et al., 2006), but have not considered how nostalgia may be related to other (and predominantly negative) aspects of daily life. These negative daily experiences could be used in experimental manipulations to determine the consequences of nostalgic feelings that are elicited from negative stimuli.

Conclusion

In summary, we find that nostalgia is a mixed emotion that varies both between and within individuals. Nostalgia-prone individuals tend to report lower well-being and are characterized by several negative traits, such as neuroticism and avoidance motivation, although they also report greater empathy. In daily life, people are more likely to feel nostalgic on days when negative social and achievement events occur than when positive events occur, although they are also more likely to help others and feel inspired when they feel nostalgic. Daily and momentary nostalgic states are consistently related to increased negative affect and are not related to concurrent positive affect. Taken together, these

findings diverge from experiments in which participants are asked to recall their "most" nostalgic experience, which typically increases well-being. Daily states of nostalgia are more negative, less positive and intense, and less beneficial for well-being than recalled extreme nostalgic experiences. Our findings indicate that nostalgia should be considered a mixed emotion that is more likely to covary with negative states than positive ones.

References

Affleck, G., Zautra, A., Tennen, H., & Armeli, S. (1999). Multilevel daily process designs for consulting and clinical psychology: A preface for the perplexed. *Journal of Consulting and Clinical Psychology, 67,* 746–754. http://dx.doi.org/10.1037/0022-006X.67.5.746

Barrett, F. S., Grimm, K. J., Robins, R. W., Wildschut, T., Sedikides, C., & Janata, P. (2010). Music-evoked nostalgia: Affect, memory, and personality. *Emotion, 10,* 390–403. http://dx.doi.org/10.1037/a0019006

Batcho, K. I. (1995). Nostalgia: A psychological perspective. *Perceptual and Motor Skills, 80,* 131–143. http://dx.doi.org/10.2466/pms.1995.80.1.131

Bauer, D. J., Preacher, K. J., & Gil, K. M. (2006). Conceptualizing and testing random indirect effects and moderated mediation in multilevel models: New procedures and recommendations. *Psychological Methods, 11,* 142–163. http://dx.doi.org/10.1037/1082-989X.11.2.142

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5,* 323–370. http://dx.doi.org/10.1037/1089-2680.5.4.323

Bentler, P. M. (2017). Specificity-enhanced reliability coefficients. *Psychological Methods, 22,* 527–540. http://dx.doi.org/10.1037/met0000092

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54,* 579–616. http://dx.doi.org/10.1146/annurev.psych.54.101601.145030

Bolger, N., Stadler, G., & Laurenceau, J. P. (2012). Power analysis for intensive longitudinal studies. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 285–301). New York, NY: Guilford Press.

Brandstätter, H. (2007). The time sampling diary (TSD) of emotional experience in everyday life situations. In J. Allen & J. Coan (Eds.), *The handbook of emotion elicitation and assessment* (pp. 318–331). New York, NY: Oxford University Press.

Brunswik, E. (1956). *Perception and the representative design of psychological experiments.* Berkeley: University of California Press.

Butler, A. C., Hokanson, J. E., & Flynn, H. A. (1994). A comparison of self-esteem lability and low trait self-esteem as vulnerability factors for depression. *Journal of Personality and Social Psychology, 66,* 166–177. http://dx.doi.org/10.1037/0022-3514.66.1.166

Cattell, R. B. (1973). *Personality and mood by questionnaire.* San Francisco, CA: Jossey-Bass.

Cheung, W.-Y., Wildschut, T., Sedikides, C., Hepper, E. G., Arndt, J., & Vingerhoets, A. J. J. M. (2013). Back to the future: Nostalgia increases optimism. *Personality and Social Psychology Bulletin, 39,* 1484–1496. http://dx.doi.org/10.1177/0146167213499187

Costello, A. B., & Osbourne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation, 10,* 1–9.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44,* 113–126. http://dx.doi.org/10.1037/0022-3514.44.1.113

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49,* 71–75. http://dx.doi.org/10.1207/s15327752jpa4901_13

Doane, L. D., & Adam, E. K. (2010). Loneliness and cortisol: Momentary, day-to-day, and trait associations. *Psychoneuroendocrinology, 35,* 430–441. http://dx.doi.org/10.1016/j.psyneuen.2009.08.005

Elliot, A. J., & Thrash, T. M. (2002). Approach-avoidance motivation in personality: Approach and avoidance temperaments and goals. *Journal of Personality and Social Psychology, 82,* 804–818. http://dx.doi.org/10.1037/0022-3514.82.5.804

Elliot, A. J., & Thrash, T. M. (2010). Approach and avoidance temperament as basic dimensions of personality. *Journal of Personality, 78,* 865–906. http://dx.doi.org/10.1111/j.1467-6494.2010.00636.x

Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods, 12,* 121–138. http://dx.doi.org/10.1037/1082-989X.12.2.121

Evans, B. (2016). Paco-applying computational methods to scale qualitative methods. *Conference Proceedings Ethnographic Praxis in Industry Conference, 2016,* pp. 348–368. http://dx.doi.org/10.1111/1559-8918.2016.01095

Feldman Barrett, L., & Russell, J. A. (1998). Independence and bipolarity in the structure of current affect. *Journal of Personality and Social Psychology, 74,* 967–984. http://dx.doi.org/10.1037/0022-3514.74.4.967

Fredrickson, B. L., & Kahneman, D. (1993). Duration neglect in retrospective evaluations of affective episodes. *Journal of Personality and Social Psychology, 65,* 45–55. http://dx.doi.org/10.1037/0022-3514.65.1.45

Gable, S. L., Reis, H. T., & Elliot, A. J. (2000). Behavioral activation and inhibition in everyday life. *Journal of Personality and Social Psychology, 78,* 1135–1149. http://dx.doi.org/10.1037/0022-3514.78.6.1135

Hepper, E. G., Ritchie, T. D., Sedikides, C., & Wildschut, T. (2012). Odyssey's end: Lay conceptions of nostalgia reflect its original Homeric meaning. *Emotion, 12,* 102–119. http://dx.doi.org/10.1037/a0025167

Hepper, E. G., Wildschut, T., Sedikides, C., Ritchie, T. D., Yung, Y.-F., Hansen, N., . . . Zhou, X. (2014). Pancultural nostalgia: Prototypical conceptions across cultures. *Emotion, 14,* 733–747. http://dx.doi.org/10.1037/a0036790

Hofmann, W., Wisneski, D. C., Brandt, M. J., & Skitka, L. J. (2014). Morality in everyday life. *Science, 345,* 1340–1343. http://dx.doi.org/10.1126/science.1251560

Iyer, A., & Jetten, J. (2011). What's left behind: Identity continuity moderates the effect of nostalgia on well-being and life choices. *Journal of Personality and Social Psychology, 101,* 94–108. http://dx.doi.org/10.1037/a0022496

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). New York, NY: Guilford Press.

Jonason, P. K., Webster, G. D., & Lindsey, A. E. (2008). Solutions to the problem of diminished social interaction. *Evolutionary Psychology, 6.* http://dx.doi.org/10.1177/147470490800600410

Little, T. D. (2013). *Longitudinal structural equation modeling.* New York, NY: Guilford Press.

Lucas, R. E., Diener, E., & Suh, E. (1996). Discriminant validity of well-being measures. *Journal of Personality and Social Psychology, 71,* 616–628. http://dx.doi.org/10.1037/0022-3514.71.3.616

Marchegiani, C., & Phau, I. (2013). Development and validation of the Personal Nostalgia Scale. *Journal of Marketing Communications, 19,* 22–43. http://dx.doi.org/10.1080/13527266.2010.542078

Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: The positivity effect in attention and memory. *Trends in Cognitive Sciences, 9,* 496–502. http://dx.doi.org/10.1016/j.tics.2005.08.005

McCrae, R. R. (2015). A more nuanced view of reliability: Specificity in the trait hierarchy. *Personality and Social Psychology Review, 19,* 97–112. http://dx.doi.org/10.1177/1088868314541857

McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Per-*

sonality and Social Psychology, 52, 81–90. http://dx.doi.org/10.1037/0022-3514.52.1.81

McGrath, J. E. (1982). Dilemmantics: The study of research choices and dilemmas. In J. E. McGrath, J. Martin, & R. A. Kulka (Eds.), Judgment calls in research (pp. 69–102). Beverly Hills, CA: Sage.

McNeish, D. (2017). Thanks coefficient alpha, we'll take it from here. Psychological Methods, 23, 412–433. http://dx.doi.org/10.1037/met0000144

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. Psychological Methods, 17, 437–455. http://dx.doi.org/10.1037/a0028085

Morelli, S. A., Rameson, L. T., & Lieberman, M. D. (2014). The neural components of empathy: Predicting daily prosocial behavior. Social Cognitive and Affective Neuroscience, 9, 39–47. http://dx.doi.org/10.1093/scan/nss088

Morewedge, C. K., Gilbert, D. T., & Wilson, T. D. (2005). The least likely of times: How remembering the past biases forecasts of the future. Psychological Science, 16, 626–630. http://dx.doi.org/10.1111/j.1467-9280.2005.01585.x

Muthén, L. K., & Muthén, B. O. (1998–2017). Mplus user's guide (8th ed.) Los Angeles, CA: Author.

Newman, D. B., & Nezlek, J. B. (2019). Private self-consciousness in daily life: Relationships between rumination and reflection and well-being, and meaning in daily life. Personality and Individual Differences, 136, 184–189. http://dx.doi.org/10.1016/j.paid.2017.06.039

Newman, D. B., Nezlek, J. B., & Thrash, T. M. (2018). The dynamics of searching for meaning and presence of meaning in daily life. Journal of Personality, 86, 368–379. http://dx.doi.org/10.1111/jopy.12321

Newman, D. B., Schug, J., Yuki, M., Yamada, J., & Nezlek, J. B. (2018). The negative consequences of maximizing in friendship selection. Journal of Personality and Social Psychology, 114, 804–824. http://dx.doi.org/10.1037/pspp0000141

Nezlek, J. B. (2001). Multilevel random coefficient analyses of event- and interval-contingent data in social and personality psychology research. Personality and Social Psychology Bulletin, 27, 771–785. http://dx.doi.org/10.1177/0146167201277001

Nezlek, J. B. (2005). Distinguishing affective and non-affective reactions to daily events. Journal of Personality, 73, 1539–1568. http://dx.doi.org/10.1111/j.1467-6494.2005.00358.x

Nezlek, J. B. (2012). Diary methods for social and personality psychology. London, England: Sage. http://dx.doi.org/10.4135/9781446287903

Nezlek, J. B. (2017). A practical guide to understanding reliability in studies of within-person variability. Journal of Research in Personality, 69, 149–155. http://dx.doi.org/10.1016/j.jrp.2016.06.020

Oishi, S., Diener, E., Choi, D.-W., Kim-Prieto, C., & Choi, I. (2007). The dynamics of daily events and well-being across cultures: When less is more. Journal of Personality and Social Psychology, 93, 685–698. http://dx.doi.org/10.1037/0022-3514.93.4.685

Parrigon, S., Woo, S. E., Tay, L., & Wang, T. (2017). CAPTION-ing the situation: A lexically-derived taxonomy of psychological situation characteristics. Journal of Personality and Social Psychology, 112, 642–681. http://dx.doi.org/10.1037/pspp0000111

Pascal, V. J., Sprott, D. E., & Muehling, D. D. (2002). The influence of evoked nostalgia on consumers' responses to advertising: An exploratory study. Journal of Current Issues and Research in Advertising, 24, 39–47. http://dx.doi.org/10.1080/10641734.2002.10505126

Philippe Rushton, J., Chrisjohn, R. D., & Cynthia Fekken, G. (1981). The altruistic personality and the self-report altruism scale. Personality and Individual Differences, 2, 293–302. http://dx.doi.org/10.1016/0191-8869(81)90084-2

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, 1, 385–401. http://dx.doi.org/10.1177/014662167700100306

Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2011). HLM for Windows (Version 7). Skokie, IL: Scientific Software International, Inc.

Rauthmann, J. F., Gallardo-Pujol, D., Guillaume, E. M., Todd, E., Nave, C. S., Sherman, R. A., . . . Funder, D. C. (2014). The Situational Eight DIAMONDS: A taxonomy of major dimensions of situation characteristics. Journal of Personality and Social Psychology, 107, 677–718. http://dx.doi.org/10.1037/a0037250

Reid, C. A., Green, J. D., Wildschut, T., & Sedikides, C. (2015). Scent-evoked nostalgia. Memory, 23, 157–166. http://dx.doi.org/10.1080/09658211.2013.876048

Ritchie, T. D., Skowronski, J. J., Wood, S. E., Richard Walker, W., Vogl, R. J., & Gibbons, J. A. (2006). Event self-importance, event rehearsal, and the fading affect bias in autobiographical memory. Self and Identity, 5, 172–195. http://dx.doi.org/10.1080/15298860600591222

Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. Psychological Bulletin, 128, 934–960. http://dx.doi.org/10.1037/0033-2909.128.6.934

Rosenberg, M. (1965). Society and the adolescent self-image. New Jersey: Princeton University Press. http://dx.doi.org/10.1515/9781400876136

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. Journal of Statistical Software, 48, 1–36. http://dx.doi.org/10.18637/jss.v048.i02

Routledge, C., Arndt, J., Sedikides, C., & Wildschut, T. (2008). A blast from the past: The terror management function of nostalgia. Journal of Experimental Social Psychology, 44, 132–140. http://dx.doi.org/10.1016/j.jesp.2006.11.001

Routledge, C., Arndt, J., Wildschut, T., Sedikides, C., Hart, C. M., Juhl, J., . . . Schlotz, W. (2011). The past makes the present meaningful: Nostalgia as an existential resource. Journal of Personality and Social Psychology, 101, 638–652. http://dx.doi.org/10.1037/a0024292

Rush, J., & Grouzet, F. M. E. (2012). It is about time: Daily relationships between temporal perspective and well-being. The Journal of Positive Psychology, 7, 427–442. http://dx.doi.org/10.1080/17439760.2012.713504

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. Journal of Personality and Social Psychology, 67, 1063–1078. http://dx.doi.org/10.1037/0022-3514.67.6.1063

Schneider, S., & Stone, A. A. (2015). Mixed emotions across the adult life span in the United States. Psychology and Aging, 30, 369–382. http://dx.doi.org/10.1037/pag0000018

Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. Journal of Personality and Social Psychology, 83, 1178–1197. http://dx.doi.org/10.1037/0022-3514.83.5.1178

Schwarz, N. (2012). Why researchers should think "real-time": A cognitive rationale. In M. R. Mehl & T. Conner (Eds.), Handbook of research methods for studying daily life (pp. 22–42). New York, NY: Guilford Press.

Schwarz, N., Kahneman, D., & Xu, J. (2009). Global and episodic reports of hedonic experience. In R. Belli, F. Stafford, & D. Alwin (Eds.), Using calendar and diary methods in life events research (pp. 156–174). Los Angeles, CA: Sage. http://dx.doi.org/10.4135/9781412990295.d15

Sedikides, C., & Wildschut, T. (2018). Finding meaning in nostalgia. Review of General Psychology, 22, 48–61. http://dx.doi.org/10.1037/gpr0000109

Sedikides, C., Wildschut, T., Routledge, C., Arndt, J., Hepper, E. G., & Zhou, X. (2015). To nostalgize: Mixing memory with affect and desire. Advances in Experimental Social Psychology, 51, 189–273. http://dx.doi.org/10.1016/bs.aesp.2014.10.001

Seidlitz, L., & Diener, E. (1993). Memory for positive versus negative life events: Theories for the differences between happy and unhappy per-

sons. *Journal of Personality and Social Psychology, 64,* 654–664. http://dx.doi.org/10.1037/0022-3514.64.4.654

Sherman, R. A., Nave, C. S., & Funder, D. C. (2010). Situational similarity and personality predict behavioral consistency. *Journal of Personality and Social Psychology, 99,* 330–343. http://dx.doi.org/10.1037/a0019796

Shiffman, S., & Stone, A. A. (1998). Ecological momentary assessment: A new tool for behavioral medicine research. In D. S. Krantz & A. Baum (Eds.), *Technology and methods in behavioral medicine* (pp. 117–131). Mahwah, NJ: Erlbaum.

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology, 4,* 1–32. http://dx.doi.org/10.1146/annurev.clinpsy.3.022806.091415

Shipp, A. J., Edwards, J. R., & Lambert, L. S. (2009). Conceptualization and measurement of temporal focus: The subjective experience of the past, present, and future. *Organizational Behavior and Human Decision Processes, 110,* 1–22. http://dx.doi.org/10.1016/j.obhdp.2009.05.001

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology, 113,* 117–143. http://dx.doi.org/10.1037/pspp0000096

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53,* 80–93. http://dx.doi.org/10.1037/0022-0167.53.1.80

Steger, M. F., & Kashdan, T. B. (2013). The unbearable lightness of meaning: Well-being and unstable meaning in life. *The Journal of Positive Psychology, 8,* 103–115. http://dx.doi.org/10.1080/17439760.2013.771208

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin, 87,* 245–251. http://dx.doi.org/10.1037/0033-2909.87.2.245

Stephan, E., Wildschut, T., Sedikides, C., Zhou, X., He, W., Routledge, C., . . . Vingerhoets, A. J. J. M. (2014). The mnemonic mover: Nostalgia regulates avoidance and approach motivation. *Emotion, 14,* 545–561. http://dx.doi.org/10.1037/a0035673

Stone, A. A., Kessler, R. C., & Haythomthwatte, J. A. (1991). Measuring daily events and experiences: Decisions for the researcher. *Journal of Personality, 59,* 575–607. http://dx.doi.org/10.1111/j.1467-6494.1991.tb00260.x

Stone, A. A. & Mackie, C. (Eds.). (2013). *Subjective well-being: Measuring happiness, suffering, and other dimensions of experience. Panel on measuring subjective well-being in a policy-relevant framework.* Washington, DC: National Research Council. Committee on National Statistics, Division of Behavioral and Social Sciences and Education, The National Academies Press.

Stone, A. A., & Shiffman, S. (1994). Ecological momentary assessment (EMA) in behavorial medicine. *Annals of Behavioral Medicine, 16,* 199–202. http://dx.doi.org/10.1093/abm/16.3.199

Thrash, T. M., & Elliot, A. J. (2003). Inspiration as a psychological construct. *Journal of Personality and Social Psychology, 84,* 871–889. http://dx.doi.org/10.1037/0022-3514.84.4.871

Thrash, T. M., Elliot, A. J., Maruskin, L. A., & Cassidy, S. E. (2010). Inspiration and the promotion of well-being: Tests of causality and mediation. *Journal of Personality and Social Psychology, 98,* 488–506. http://dx.doi.org/10.1037/a0017906

Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology, 76,* 284–304. http://dx.doi.org/10.1037/0022-3514.76.2.284

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review, 117,* 440–463. http://dx.doi.org/10.1037/a0018963

Turner, R. N., Wildschut, T., & Sedikides, C. (2012). Dropping the weight stigma: Nostalgia improves attitudes toward persons who are overweight. *Journal of Experimental Social Psychology, 48,* 130–137. http://dx.doi.org/10.1016/j.jesp.2011.09.007

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3,* 4–70. http://dx.doi.org/10.1177/109442810031002

Vess, M., Arndt, J., Routledge, C., Sedikides, C., & Wildschut, T. (2012). Nostalgia as a resource for the self. *Self and Identity, 11,* 273–284. http://dx.doi.org/10.1080/15298868.2010.521452

Walker, W. R., Vogl, R. J., & Thompson, C. P. (1997). Autobio-graphical memory: Unpleasantness fades faster than pleasantness over time. *Applied Cognitive Psychology, 11,* 399–413. http://dx.doi.org/10.1002/(SICI)1099-0720(199710)11:5<399::AID-ACP462>3.0.CO;2-E

Walters, N. T., & Horton, R. (2015). A diary study of the influence of Facebook use on narcissism among male college students. *Computers in Human Behavior, 52,* 326–330. http://dx.doi.org/10.1016/j.chb.2015.05.054

Wenninger, H., Krasnova, H., & Buxmann, P. (2014). Activity matters: Investigating the influence of Facebook on life satisfaction of teenage users. *European Conference on Information Systems,* June 9–11, 2014, Tel Aviv, Israel.

West, S. G., & Hepworth, J. T. (1991). Statistical issues in the study of temporal data: Daily experiences. *Journal of Personality, 59,* 609–662. http://dx.doi.org/10.1111/j.1467-6494.1991.tb00261.x

Wildschut, T., Sedikides, C., Arndt, J., & Routledge, C. (2006). Nostalgia: Content, triggers, functions. *Journal of Personality and Social Psychology, 91,* 975–993. http://dx.doi.org/10.1037/0022-3514.91.5.975

Williams, E. J. (1959). *Regression analysis.* New York, NY: Wiley.

Yuan, K.-H., & Bentler, P. M. (2000). Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological Methodology, 30,* 165–200. http://dx.doi.org/10.1111/0081-1750.00078

Zhou, X., Sedikides, C., Wildschut, T., & Gao, D.-G. (2008). Counteracting loneliness: On the restorative function of nostalgia. *Psychological Science, 19,* 1023–1029. http://dx.doi.org/10.1111/j.1467-9280.2008.02194.x

Zhou, X., Wildschut, T., Sedikides, C., Chen, X., & Vingerhoets, A. J. J. M. (2012). Heartwarming memories: Nostalgia maintains physiological comfort. *Emotion, 12,* 678–684. http://dx.doi.org/10.1037/a0027236

Zhou, X., Wildschut, T., Sedikides, C., Shi, K., & Feng, C. (2012). Nostalgia: The gift that keeps on giving. *Journal of Consumer Research, 39,* 39–50. http://dx.doi.org/10.1086/662199

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77,* 1271–1288. http://dx.doi.org/10.1037/0022-3514.77.6.1271

(Appendix follows)

Appendix

Personal Inventory of Nostalgic Experiences (PINE) Scale

Item number	Statement
1	How nostalgic do you feel?
2	To what extent do you feel sentimental for the past?
3	How much do you feel a wistful affection for the past?
4	To what extent do you feel a longing to return to a former time in your life?