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To cite this article: Tim Wildschut, Constantine Sedikides, Bettina Zengel & John J. Skowronski (2026) Remembrance of things past: temporal change in the affective signature of nostalgic events, *Cognition and Emotion*, 40:1, 140-156, DOI: [10.1080/02699931.2025.2484646](https://doi.org/10.1080/02699931.2025.2484646)

To link to this article: <https://doi.org/10.1080/02699931.2025.2484646>



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Remembrance of things past: temporal change in the affective signature of nostalgic events

Tim Wildschut^a, Constantine Sedikides^a, Bettina Zengel^b and John J. Skowronski^c

^aCentre for Research on Self and Identity, School of Psychology, University of Southampton, Southampton, UK; ^bDepartment of Psychology, University of Essex, Colchester, UK; ^cDepartment of Psychology, Northern Illinois State University, DeKalb, IL, USA

ABSTRACT

We examined, through retrospective reports, the affect and emotion changes over time (from event occurrence to event recall) that characterise nostalgic events, and how those changes differ from the affect and emotion changes that characterise ordinary (Experiment 1) or neutral (Experiment 2) control events. In both experiments, nostalgic (but not control) events were characterised by a combined fading of positive affect and intensification of negative affect over time. Yet, nostalgic events were associated with more positive affect than control events, particularly at occurrence, but also at recall. In Experiment 1, this positivity of nostalgic (compared to control) events was a plausible statistical mediator of nostalgia's psychological benefits. In Experiment 2, the fading of positive affect and intensification of negative affect associated with nostalgic events were plausibly mediated by, respectively, increases in the discrete emotions of regret and loneliness from event occurrence to event recall.

ARTICLE HISTORY

Received 13 March 2024
Revised 17 February 2025
Accepted 21 March 2025

KEYWORDS

Nostalgia; fading affect bias; affect change; regret; loneliness



Now many a year has passed me by
I still recall the best thing I ever had
– Bob Dylan and The Band, *Bessie Smith* (released in 1975)


Interest in nostalgia has grown exponentially over the past two decades, addressing the emotion's nature and prevalence along with its psychological benefits. Despite this upswing in research, questions persist regarding the affective signature of nostalgia, as well as nostalgia's role in conferring psychological benefits. Relying on techniques from the fading affect bias literature, we address these questions in two experiments.

What is nostalgia?

Nostalgia is “a sentimental longing or wistful affection for the past” (The New Oxford Dictionary of English, 1998, p. 1266). It occurs frequently (i.e. several times a week), and across ages and cultures (Hepper et al.,

2021, 2024). When waxing nostalgic, one typically brings to mind momentous events from one's past (e.g. wedding anniversaries, birthday celebrations, vacations) or interactions with close others (e.g. family members, partner, friends; Wildschut et al., 2006), conferring important psychological benefits. These benefits include: (a) social connectedness, a sense of acceptance and belongingness (Sedikides & Wildschut, 2019); (b) self-continuity, a sense of connection between one's past and one's present selves (Sedikides et al., 2023); (c) self-esteem, a sense of liking and valuing of the self (Evans et al., 2021); (d) meaning, a sense of life as meaningful and purposeful (Sedikides & Wildschut, 2018); (e) optimism, a sense of hopefulness and confidence about one's future (Cheung et al., 2013); and (f) inspiration, a sense of moving away from the mundane, gaining an awareness of better possibilities, and being motivated to enact them (Stephan et al., 2015).

CONTACT Tim Wildschut  timw@soton.ac.uk  Centre for Research on Self and Identity, School of Psychology, University of Southampton, Southampton, SO17 1BJ, UK

 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/02699931.2025.2484646>.

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Nostalgia also entails fondness mixed with longing (Frankenbach et al., 2021; Hepper et al., 2012; Leunissen, 2023; Sedikides & Wildschut, 2016) and has been characterised as “a joy tinged with sadness” (Werman, 1977, p. 393). Where might these bittersweet feelings come from? After all, nostalgic events are posited to be largely positive at the time of their occurrence. It has been proposed that the bittersweetness evoked at recall is linked to the inexorable passage of time and the sense of loss this might produce (van Tilburg et al., 2019). For example, reflecting on nostalgic events might prompt ideas about “innocence lost” or “love lost”. These appraisals can be added to events as they are processed over time, producing bittersweet feelings at event recall (Beiser & Wickrama, 2004; Wildschut et al., 2019). Indeed, results from an integrative data analysis of 41 experiments (Leunissen et al., 2021) revealed that nostalgia inductions (compared to various control conditions) prompted positive affect and ambivalent or bittersweet affect, but not negative affect.

Nostalgia elicitation and change in affect over time

Nostalgia can be elicited by a variety of experimental techniques (Wildschut & Sedikides, 2025), with the event reflection task being the most common one (Sedikides et al., 2015; see also Fetterman et al., 2024). Participants in the experimental condition of the event reflection task bring to mind a nostalgic event from their lives, relive it, list a few relevant keywords, and describe in writing how the event made them feel. Participants in the control condition follow the same protocol, but for an ordinary event. Measures collected after the induction assess the variables of interest, such as the affect prompted by event recall (e.g. positive, negative, or ambivalent) and psychological benefits (e.g. social connectedness, self-continuity).

Yet, the theoretical reasoning regarding the emergence of nostalgia’s bittersweetness focuses on change. Whereas, at event occurrence, the nostalgic event might largely prompt positive affect, over time and with contemplation (e.g. thinking about what has been lost) event recall may come to prompt bittersweetness. A concern with the event reflection task and other nostalgia elicitation methods, then, is that they do not assess change but focus only on the reactions produced at event recall. Hence, whereas considerable evidence shows that the reactions prompted by recall of nostalgic

events differ from those prompted by control events (Leunissen et al., 2021; Sedikides et al., 2015), that evidence does not establish that these differences are caused by changes over time. Demonstrating change requires an experimental paradigm that assesses reactions to events both at event occurrence and at event recall.

The fading affect bias (FAB) paradigm

Fortunately, this exact change-focused approach has been used in an area of research exploring the Fading Affect Bias (FAB). FAB studies assess affect prompted at event recall and examine the extent to which it differs from the affect experienced at event occurrence. The FAB has been examined in many prospective momentary ecological assessment studies, in which affect was assessed at event occurrence and again at event recall (e.g. Ritchie et al., 2006). The FAB has also been examined in many retrospective report studies, in which participants’ affect at event occurrence and at event recall was assessed retrospectively and simultaneously at the time of event recall. The results have invariably converged (for a review, see Skowronski et al., 2014), leading to widespread adoption of retrospective designs due to ease of administration and cost-effectiveness. Accordingly, we opted for such a design in the present research.

The typical FAB result is that the affect prompted at event recall often changes in intensity from the affect experienced at the time the event occurred (Walker & Skowronski, 2009). However, this change is usually not equivalent for positive events and negative events. The intensity of negative affect associated with events that were negative at their occurrence usually fades substantially at recall. In comparison, the intensity of positive affect associated with events that were positive at their occurrence usually persists from event occurrence to event recall. However, though robust, this general pattern is not always evinced: The emergence of the FAB is qualified by event type (e.g. newer vs. older, more vs. less important) and various individual differences (e.g. depression or anxiety; Ritchie et al., 2019; Skowronski et al., 2014).

The present research

Several questions surround the affect and emotion prompted by nostalgia. These include: (a) what kind

of affect – positive or negative – and what kind of emotions are prompted; (b) are affect and emotions present at the time of event occurrence or at the time of event recall; and (c) do affect and emotions change from occurrence to recall? To our knowledge, no research has examined how affect associated with nostalgic events changes over time. The methods used in FAB studies can address this lacuna and offer new insights.

Affect change

Indeed, nostalgic events may constitute a notable qualification to the usual FAB pattern. When ideas about “innocence lost” or “love lost” become part of nostalgic events over time, this may dull some of their original shine, producing a sense of bittersweetness when recalled. This pattern should not emerge for ordinary events or neutral events. For these events, we expect to replicate the FAB, such that the negative affect associated with them fades more strongly from event occurrence to event recall than does the positive affect. Accordingly, our confirmatory hypothesis was:

H1: Whereas the FAB will be replicated for ordinary and neutral events, nostalgic events will show a different pattern; these events will be associated with relatively more negative affect and less positive affect at recall than at occurrence.

We tested this hypothesis in two experiments. In Experiment 1, we implemented the standard event reflection task, contrasting a nostalgic-event condition with an ordinary-event control condition. In Experiment 2, we based the control condition on FAB studies, in which participants are typically instructed to recall events that can be retrieved as occurring at a specific time in a specific place. Accordingly, we instructed control participants in this experiment to recall an affectively neutral, unique event. This neutral-event control condition provided an alternative baseline against which the affect change associated with nostalgic events could be assessed. As such, Experiment 2 offered a corroborative test of H1.

Psychological benefits

Existing nostalgia research has typically assessed affect only at the time of event recall. This leaves unclear if and how affect is linked to nostalgia’s psychological benefits. For example, if recalling nostalgic (compared to ordinary) events augments

social connectedness, one can ask whether this is due in part to the event’s greater positivity, lesser negativity, or both. Additionally, in the context of a FAB paradigm, one can examine whether nostalgia’s benefits are best explained by affect at event occurrence or event recall.

Accordingly, a second research objective was to explore the extent to which the psychological benefits of nostalgia were related to positive affect and negative affect at event occurrence and at event recall. We went beyond the examination of simple relations to explicitly test whether patterns of affect plausibly mediate nostalgia’s benefits. These ideas are more formally stated in the following exploratory hypothesis, which we tested in Experiment 1:

H2: The beneficial psychological effects of recalling nostalgic (compared to ordinary) events may be plausibly mediated by corresponding effects on positive affect and/or negative affect at event occurrence and/or event recall.

Change in discrete emotions

Our final objective was to explore possible relations between nostalgia and discrete emotions, as well as the extent to which those discrete emotions may play a role in eliciting global positive affect and negative affect. To do so, in addition to assessing the positive affect and negative affect prompted at event occurrence and event recall, we measured the extent to which events evoked each of 13 discrete, self-relevant emotions. We selected 10 of these discrete emotions (five positive, five negative) based on their prior inclusion in multidimensional scaling analyses of nostalgia (van Tilburg et al., 2018). They were pride, self-compassion, gratitude, inspiration, passion, guilt, embarrassment, shame, hurt feelings, and unrequited love. Additionally, based on the known relation of each with nostalgia, we included measures of loneliness (Wildschut et al., 2006), loss (van Tilburg et al., 2019), and regret (Leunissen et al., 2021).

We were particularly interested in exploring the idea that changes from event occurrence to event recall in the discrete emotions plausibly mediated changes in global positive affect and negative affect. For example, if nostalgic events are associated with more regret at the time of recall than of occurrence, one can test whether regret plausibly mediates the intensification of negative affect and fading of positive affect that is expected to emerge for these

events over time. We did not have a priori expectations as to which, if any, of the 13 discrete emotions would account for temporal trajectories of global affect. Accordingly, casting a wide net, we proposed the following exploratory hypothesis, which we tested in Experiment 2:

H3: The intensification of negative affect and fading of positive affect associated with nostalgic (compared to neutral) events may be plausibly mediated by corresponding changes over time in one or more of the assessed discrete emotions.

Both experiments received ethical approval from University of Southampton. We report all manipulations, measures, and data exclusions, and we follow journal article reporting standards (Kazak, 2018). We did not preregister the experiments. Data and analysis code are available at https://osf.io/wxmk3/?view_only=24de6ad0d4c748a483977fab41e58cf8.¹

Experiment 1

In Experiment 1, we tested whether nostalgic (relative to ordinary) events are associated with more negative affect and less positive affect at recall than at occurrence (H1). We also explored whether positive and/or negative affect at event occurrence and/or event recall plausibly mediate nostalgia's psychological benefits (H2).

Method

Participants

We recruited 204 University of Southampton undergraduates for course credit. We excluded five participants who did not follow instructions. Of the remaining 199 participants, 86.4% identified as female (1 participant did not answer the question). Participants identified predominantly as White (66.3%) or as British or English (16.1%), though other ethnicities were also represented (Asian: 7.5%; Mixed ethnicities: 5.0%; Greek or Cypriot: 1.5%; Black: 1%; other ethnicities: 2.0%; 2 participants did not answer the question). Participant age ranged from 18 to 37 years ($M = 20.02$, $SD = 2.24$).

Materials and procedure

Participants completed the experiment online. Each participant was randomly assigned to one of two event reflection task conditions. Participants in the nostalgic-event condition ($n = 100$) received a definition of nostalgia and were instructed to (a)

remember a nostalgic event from their lives, (b) reflect on the experience for five minutes, and (c) provide up to four keywords describing the nostalgic event. Participants in the ordinary-event control condition ($n = 99$) received similar instructions but recalled an event that was ordinary, mundane, and typical.

Next, participants completed the first measure of affect change. They rated how the event made them feel at the time it occurred on two items (Ritchie et al., 2006): "How positive did the event make you feel AT THE TIME IT OCCURRED?" and "How negative did the event make you feel AT THE TIME IT OCCURRED?" (0 = *not at all positive [negative]*, 3 = *moderately positive [negative]*, 6 = *extremely positive [negative]*). Subsequently, participants responded to 24 items assessing six benefits (Hepper et al., 2012; Sedikides et al., 2016). Each benefit was indexed with four items, preceded by the stem "With this event in mind, I feel ... " (−3 = *strongly disagree*, 3 = *strongly agree*). The benefits were: social connectedness (e.g. "... connected to loved ones"; $\alpha = .94$), self-continuity (e.g. "... connected with who I was in the past"; $\alpha = .86$), self-esteem (e.g. "... I value myself more"; $\alpha = .95$), meaning in life (e.g. "... life has a purpose"; $\alpha = .95$), optimism (e.g. "... ready to take on new challenges"; $\alpha = .93$), and inspiration (e.g. "... filled with inspiration"; $\alpha = .95$).

Afterward, participants completed the second measure of affect change. They rated how the remembered event made them feel at the time of recall on two items (Ritchie et al., 2006): "How positive did the event make you feel WHEN YOU RECALL IT NOW?" and "How negative did the event make you feel WHEN YOU RECALL IT NOW?" (0 = *not at all positive [negative]*, 3 = *moderately positive [negative]*, 6 = *extremely positive [negative]*). Finally, as a manipulation check, participants rated how nostalgic they felt when they completed the event reflection task (1 = *not nostalgic at all*, 7 = *very nostalgic*) and how familiar they were with the term nostalgia (1 = *not familiar at all*, 7 = *very familiar*).

Results

Manipulation check and familiarity with "nostalgia"

The nostalgia manipulation was effective. Participants who recalled nostalgic events ($M = 5.56$, $SD = 1.44$) felt significantly more nostalgic than those who recalled ordinary events ($M = 3.26$, $SD = 1.93$), $F(1, 197) =$

91.10, $p < .001$, $\eta^2 = .316$, 90% CI [.230, .393].² Further, participants in the nostalgic-event ($M = 5.87$, $SD = 1.13$) and ordinary-event ($M = 5.64$, $SD = 1.33$) conditions did not differ significantly in terms of their familiarity with the term “nostalgia”, $F(1, 195) = 1.66$, $p = .200$, $\eta^2 = .008$, 90% CI [.000, .042].

H1: affect change

Our primary analysis compared affect change for nostalgic and ordinary events. Accordingly, we conducted a 2 (Event Type: nostalgic, ordinary) \times 2 (Affect Valence: positive, negative) \times 2 (Time: event occurrence, event recall) mixed Analysis of Variance (ANOVA). Event type was a between-subjects variable, whereas affect valence and time were within-subjects variables. We provide descriptive statistics in Table 1.

The analysis yielded a significant Event Type \times Affect Valence \times Time interaction, $F(1, 196) = 39.00$, $p < .001$, $\eta^2 = .166$, 90% CI [.093, .243]. Interpretations of all significant lower-order effects are qualified by this significant three-way interaction. For completeness, we report all significant lower-order effects, but do not extensively discuss them. They included two main effects, one for event type ($F[1, 196] = 33.27$, $p < .001$, $\eta^2 = .145$, 90% CI [.076, .220]) and one for affect valence ($F[1, 196] = 330.41$, $p < .001$, $\eta^2 = .628$, 90% CI [.562, .677]). Three significant two-way interactions also emerged. These were between event type and affect valence ($F[1, 196] = 48.42$, $p < .001$, $\eta^2 = .198$, 90% CI [.120, .276]), event type and time ($F[1, 196] = 7.94$, $p = .005$, $\eta^2 = .039$, 90% CI [.007, .092]), and affect valence and time ($F[1, 196] = 5.00$, $p = .026$, $\eta^2 = .025$, 90% CI [.002, .071]).

Partitioning the Event Type \times Affect Valence \times Time interaction. We now turn to the crucial three-way interaction among event type, affect valence, and time (Table 1). We probed this interaction by testing each of its constituent two-way interactions within levels of the third independent variable. We then followed up by probing each significant two-way interaction with tests of simple effects, as follows:

Table 1. Mean positive and negative affect ratings and standard deviations (in parentheses) as a function of event type (nostalgic, ordinary) and time (event occurrence, event recall): Experiment 1.

	Nostalgic event		Ordinary event	
	Occurrence	Recall	Occurrence	Recall
Positive affect	5.31 (1.07)	4.68 (1.39)	3.27 (1.63)	3.46 (1.72)
Negative affect	0.53 (0.99)	1.39 (1.68)	1.82 (1.68)	1.31 (1.45)

1. We tested the Affect Valence \times Time interaction for nostalgic events and ordinary events. To examine the FAB, we probed these two-way interactions with tests of simple time effects.
2. We tested the Event Type \times Time interaction for positive affect and negative affect. To examine the hedonic character of nostalgic (compared to ordinary) events, we probed these two-way interactions with tests of simple event-type effects.
3. We tested the Event Type \times Affect Valence interaction at occurrence and at recall. To examine if events were rated as more positive than negative (i.e. positivity offset; Cacioppo & Berntson, 1994), we probed these two-way interactions with tests of simple affect-valence effects. We report results for this third and final set of analyses in Supplemental Material.

Fading affect bias: Affect Valence \times Time interaction in the ordinary-event condition and the nostalgic-event condition. In the ordinary-event condition, the Affect Valence \times Time interaction was significant, $F(1, 196) = 7.95$, $p = .005$, $\eta^2 = .039$, 90% CI [.007, .092]. The simple effect of time on positive affect was not significant, $F(1, 196) = 2.02$, $p = .156$, $\eta^2 = .010$, 90% CI [.000, .045]. Positive affect at event recall did not differ significantly from positive affect at event occurrence. The simple effect of time on negative affect was significant, $F(1, 196) = 11.78$, $p < .001$, $\eta^2 = .057$, 90% CI [.015, .116]. Negative affect was lower (i.e. faded) at event recall than at event occurrence.

In the nostalgic-event condition, the Affect Valence \times Time interaction was also significant, $F(1, 196) = 36.34$, $p < .001$, $\eta^2 = .156$, 90% CI [.086, .232]. Follow up tests of simple time effects revealed a contrasting pattern compared to the ordinary-event condition. Positive affect was significantly lower (i.e. faded) at event recall than at event occurrence, $F(1, 196) = 21.81$, $p < .001$, $\eta^2 = .100$, 90% CI [.043, .169]. Negative affect, however, was significantly higher at event recall than at event occurrence, $F(1, 196) = 34.15$, $p < .001$, $\eta^2 = .148$, 90% CI [.079, .224].

This overall pattern of results both replicates past FAB findings (in the ordinary-event condition) and reveals circumstances in which the pattern of affect change deviates from the standard FAB findings (in the nostalgic-event condition). Specifically, in the ordinary-event condition, the intensity of negative affect faded from event occurrence to event recall more strongly than did the intensity of positive affect (which did not change significantly from

occurrence to recall). In the nostalgic-event condition, however, the results pattern was entirely different. Whereas positive affect faded from event occurrence to event recall, negative affect increased over time. These findings confirm H1.

Hedonic character of nostalgia: Event Type × Time interaction for positive affect and for negative affect. For positive affect, the Event Type × Time interaction was significant, $F(1, 196) = 18.46, p < .001, \eta^2 = .086, 90\% \text{ CI } [.033, .153]$. Tests of simple event-type effects revealed that, at occurrence, nostalgic (compared to ordinary) events were higher in positive affect, $F(1, 196) = 108.88, p < .001, \eta^2 = .357, 90\% \text{ CI } [.270, .432]$. At recall, nostalgic (compared to ordinary) events were also higher in positive affect albeit by a smaller margin, $F(1, 196) = 30.24, p < .001, \eta^2 = .134, 90\% \text{ CI } [.067, .207]$.

For negative affect, the Event Type × Time interaction was also significant, $F(1, 196) = 42.90, p < .001, \eta^2 = .180, 90\% \text{ CI } [.105, .257]$. The pattern was complementary to the one observed for positive affect (i.e. a larger difference favouring nostalgic over ordinary events at occurrence than at recall). Specifically, at occurrence, nostalgic (compared to ordinary) events were lower in negative affect, $F(1, 196) = 43.43, p < .001, \eta^2 = .181, 90\% \text{ CI } [.106, .259]$. At recall, nostalgic events did not differ significantly from ordinary ones on negative affect, $F(1, 196) = 0.14, p = .707, \eta^2 = .001, 90\% \text{ CI } [.000, .018]$.

Psychological benefits

We conducted a series of ANOVAs, each with a different psychological benefit as the dependent measure (Table 2). Replicating prior findings, participants in the nostalgic-event condition reported significantly higher levels of social connectedness, self-continuity, self-esteem, meaning in life, optimism, and inspiration than those in the ordinary-event condition.

H2: mediation analyses

Nostalgic (compared to ordinary) events elicited more positive affect, particularly at occurrence, but also at recall. Nostalgic (compared to ordinary) events also elicited less negative affect at occurrence, but not at recall. Furthermore, recalling nostalgic (compared to ordinary) events conferred psychological benefits. Jointly, these results set the stage for addressing H2. Specifically, we conducted mediation analyses to test whether the benefits of recalling nostalgic (compared to ordinary) events were plausibly mediated by positive and/or negative affect at occurrence and/or at recall.³

Simple and parallel mediation of psychological benefits by affect. We used Hayes' (2022) PROCESS macro (Model 4, 5,000 bootstraps) and present indirect or mediated effects in Table 3. Findings were generally consistent across benefits. In simple mediation analyses, higher positive affect at occurrence and at recall, as well as lower negative affect at occurrence, plausibly mediated the benefits of recalling nostalgic (compared to ordinary) events. Given the absence of a significant event-type effect on negative affect at recall, this variable did not play a mediational role, and we did not enter it in parallel mediation analyses.

Results of parallel mediation analyses implicated higher positive affect at recall as the key mediator of nostalgia's benefits. Positive affect at recall was the only significant mediator in all parallel mediation analyses, except one. The exception was the analysis of social connectedness, which revealed that both higher positive affect at recall and at occurrence independently and plausibly mediated the event-type effect on this benefit.

Serial mediation of psychological benefits by positive affect at occurrence and at recall. The evidence identifies positive affect at recall as the plausible proximal mediator of nostalgia's psychological benefits and rules out a mediational role for negative affect at recall. But might positive and/or negative affect at occurrence, both of which were significantly impacted by event type, be associated indirectly with benefits via a serial mediational process involving positive affect at recall? We present the generic serial mediation model involving a distal and proximal mediator in Figure 1(a).

We first considered negative affect at occurrence and established that it did not qualify as distal mediator, because it was not significantly associated with positive affect at recall (i.e. the proximal mediator) when controlling for event type and positive affect at occurrence, $b^* = .028, t(194) = 0.40, p = .690$. That is, with negative affect at occurrence as a distal mediator, the second link in the serial process is broken. Positive affect at occurrence, however, did qualify as a plausible distal mediator as it was positively associated with positive affect at recall when controlling for event type and negative affect at occurrence, $b^* = .696, t(194) = 8.72, p < .001$.

We therefore tested, for each benefit, a serial mediation model with positive affect at occurrence as distal mediator and positive affect at recall as proximal mediator (Figure 1(b); Hayes' [2022] PROCESS macro, Model 6). Results revealed significant serial

Table 2. Comparisons between nostalgic-event condition and ordinary-event condition on psychological benefits: Experiment 1.

	Nostalgic event <i>M</i> (<i>SD</i>)	Ordinary event <i>M</i> (<i>SD</i>)	<i>F</i> (1, <i>ddf</i>)	<i>p</i>	η^2	90% CI
Social connectedness	2.00 (1.16)	−0.08 (1.65)	103.90	<.001	.351	.263, .428
Self-continuity	1.57 (1.07)	0.16 (1.47)	57.95	<.001	.232	.150, .312
Self-esteem	1.46 (1.14)	0.47 (1.54)	26.65	<.001	.121	.057, .193
Meaning	1.97 (1.03)	0.43 (1.56)	66.81	<.001	.257	.173, .337
Optimism	1.51 (1.10)	0.46 (1.49)	30.94	<.001	.140	.072, .216
Inspiration	1.29 (1.19)	0.08 (1.60)	35.19	<.001	.155	.084, .231

Note: Denominator degrees of freedom (*ddf*) vary between 190 and 194 due to missing values.

indirect effects on each benefit: on social connectedness = .454, 95% CI = [.244, .768]; on self-continuity = .413, 95% CI = [.224, .695]; on self-esteem = .517, 95% CI = [.301, .834]; on meaning = .661, 95% CI = [.531, .791]; on optimism = .458, 95% CI = [.273, .736], and on inspiration = .471, 95% CI = [.266, .773].

Direct effects of nostalgia on psychological benefits. Finally, we tested the direct effect of nostalgia (vs. control) on psychological benefits when controlling the mediators. Table 4 presents these direct effects in the parallel and serial mediation analyses. In each type of analysis, nostalgia had a significant direct effect on all psychological benefits, except self-esteem. The significant direct effects of nostalgia indicate that the mediational pathways via positive affect at recall and (serially) positive affect at occurrence were sufficient but not necessary to produce nostalgia's psychological benefits.

Discussion

Experiment 1 revealed that nostalgic (but not control) events were characterised by a decrease in positive affect and an increase in negative affect over time. This pattern of affect change fits the notion that recalling nostalgic events can bring plaintive reflections on "a past that has been left behind" (Iyer & Jetten, 2011, p. 96). For ordinary events, we replicated the FAB, such that the negative affect associated with these events faded more strongly over time than did positive affect.

Although nostalgic events were associated with more negative affect and less positive affect over time, these events nonetheless conjured more positive affect than did ordinary ones, particularly at occurrence, but also at recall. This relative positivity of nostalgic (compared to ordinary) events plausibly mediated the effects of recalling nostalgic events on social connectedness, self-continuity, self-esteem, meaning in life, optimism, and inspiration. Specifically, our findings supported a serial mediation model

(Figure 1(b)). According to this model, nostalgic (compared to ordinary) events evoke more positive affect at the time they occur and, consequently, generate more positive affect when recalled, thereby contributing to psychological benefits.

Finally, the sizeable positivity offset for ordinary events is consistent with evidence from an integrative data analysis that such events are not affectively neutral (Leunissen et al., 2021). We addressed this issue in Experiment 2 by modifying the control condition.

Experiment 2

Experiment 2 built on Experiment 1 in two ways. First, to better match the typical procedure of FAB studies, we instructed participants in the control condition to recall an affectively neutral, unique event (rather than an ordinary event as in Experiment 1). By so doing, we tested the conceptual replicability of the Experiment 1 findings regarding affect change: are nostalgic (compared to neutral) events associated with relatively more negative affect and less positive affect at recall than at occurrence (H1)? Second, where Experiment 1 explored the potential downstream consequences of nostalgia-related affect in terms of psychological benefits (H2), Experiment 2 moved to address the potential discrete emotional antecedents of nostalgia-related affect. Specifically, we tested whether the intensification of negative affect and fading of positive affect associated with nostalgic (compared to neutral) events are plausibly mediated by corresponding changes over time in 13 discrete, self-relevant emotions (H3).

Method

Participants

We recruited 200 MTurk workers, compensating them with \$0.25. We excluded data from three participants who did not follow instructions. We randomly

Table 3. Indirect effects in mediation analyses with event type as independent variable, affect ratings as (simple and parallel) mediators, and psychological benefits as outcome variables: Experiment 1.

Outcome	Mediator						
	Positive affect at occurrence		Negative affect at occurrence		Positive affect at recall		Negative affect at recall
	Simple	Parallel	Simple	Parallel	Simple	Parallel	Simple
Social connectedness	0.90*	0.37*	0.37*	0.08	0.52*	0.40*	-0.02
Self-continuity	0.58*	0.16	0.20*	0.01	0.42*	0.38*	-0.01
Self-esteem	0.82*	0.27	0.30*	0.04	0.54*	0.46*	-0.02
Meaning	0.80*	0.32	0.27*	0.02	0.55*	0.45*	-0.02
Optimism	0.69*	0.25	0.23*	-0.01	0.47*	0.41*	-0.01
Inspiration	0.81*	0.36	0.23*	-0.03	0.54*	0.43*	-0.01

Note: Tabled values are unstandardised indirect effects. Simple denotes simple mediation analyses with a single mediator. Parallel denotes parallel mediation analyses in which three mediators (positive affect at occurrence, positive affect at recall, negative affect at occurrence) were entered simultaneously. Asterisks (*) indicate statistically significant indirect effects. Indirect effects are statistically significant when their bootstrapped 95% confidence interval does not include zero. We present these 95% confidence intervals in Supplemental Material, Table S1.

assigned the remaining 197 participants to conditions (nostalgic event, $n = 101$; neutral event, $n = 96$). Most (62.4%) participants identified as female, with two participants choosing a category other than male or female and two participants skipping the question. Also, most (66.5%) participants identified as White, Caucasian, or European-American, with other ethnicities also being represented (Asian/Korean/Taiwanese/South-Asian/Vietnamese: 10.2%; Black/African American: 8.6%; Hispanic/Latino/Latina/Mexican: 4.6%; Mixed ethnicity: 5.1%; other ethnicity: 4.0%; 2 participants did not answer the question). Participant age ranged from 18–76 years ($M = 36.88$, $SD = 14.06$).

Materials and procedure

The procedure generally mirrored Experiment 1. One exception concerned the nature of the event recalled in the control condition. Instead of instructing participants to report an ordinary event (as in Experiment 1), we instructed them to “think of an event in your life that you felt neutral about”. Additionally, we told

participants that the neutral event should have been “unique in the sense that it happened at a particular time and place and did not happen all the time”.

The second change to the Experiment 1 method concerned the measures used in Experiment 2. We did not assess psychological benefits again as they pertained to H2, which we addressed in Experiment 1. Instead, to answer H3, we assessed the extent to which the discrete self-relevant emotions of pride, self-compassion, gratitude, inspiration, passion, guilt, embarrassment, shame, hurt feelings, unrequited love, loneliness, loss, and regret were associated with events. Participants rated both how much they felt these self-relevant emotions when the event occurred and when they recalled the event (0 = *not at all*, 6 = *extremely*).⁴

Results

Manipulation check and familiarity with “nostalgia”

The nostalgia manipulation was effective. Participants who recalled nostalgic events ($M = 5.97$, $SD = 1.22$) felt

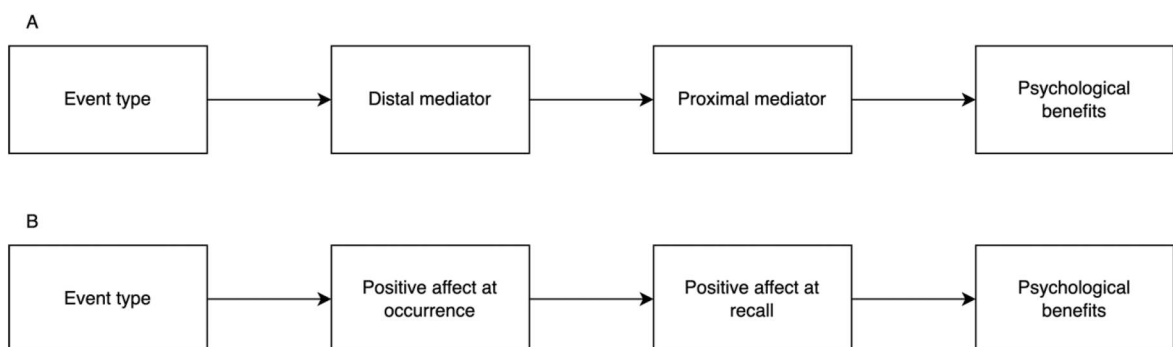
**Figure 1.** Serial mediation model tested in Experiment 1.

Table 4. Direct effects of event type in parallel and serial mediation analyses: Experiment 1.

Outcome	Parallel				Serial			
	<i>b</i> *	<i>t</i>	df	<i>p</i>	<i>b</i> *	<i>t</i>	df	<i>p</i>
Social connectedness	.35	5.69	188	<.001	.35	5.74	189	<.001
Self-continuity	.29	4.01	188	<.001	.29	4.04	189	<.001
Self-esteem	.08	1.15	190	.253	.08	1.18	191	.238
Meaning	.25	3.84	189	<.001	.26	3.87	190	<.001
Optimism	.15	2.00	186	.047	.15	2.00	187	.047
Inspiration	.15	2.06	188	.043	.15	2.05	189	.042

Note: *b** = standardised regression coefficient. Parallel denotes mediation analyses in which three mediators (positive affect at occurrence, negative affect at occurrence, positive affect at recall) were entered simultaneously. Serial denotes mediation analyses in which positive affect at occurrence (distal mediator) and positive affect at recall (proximal mediator) serially mediated the effect of event type. Degrees of freedom (df) vary within columns due to missing values.

significantly more nostalgic than those who recalled neutral events ($M = 3.22$, $SD = 2.01$), $F(1, 192) = 134.65$, $p < .001$, $\eta^2 = .412$, 90% CI [.326, .485]. Further, participants in the nostalgic-event ($M = 6.32$, $SD = 1.14$) and neutral-event ($M = 6.12$, $SD = 1.15$) conditions did not differ significantly on familiarity with the term “nostalgia”, $F(1, 191) = 1.56$, $p = .213$, $\eta^2 = .008$, 90% CI [.000, .042].

H1: affect change

We conducted a 2 (Event Type: nostalgic, neutral) \times 2 (Affect Valence: positive, negative) \times 2 (Time: event occurrence, event recall) mixed ANOVA. Event type was a between-subjects variable, and affect valence and time were within-subjects variables. We provide descriptive statistics in Table 5.

The analysis revealed a significant Event Type \times Affect Valence \times Time interaction, $F(1, 191) = 12.80$, $p < .001$, $\eta^2 = .063$, 90% CI [.018, .125]. Interpretations of all significant lower-order effects are qualified by this three-way interaction. For completeness, we report all significant lower-order effects, but do not extensively discuss them. They included significant main effects for event type ($F[1, 191] = 49.61$, $p < .001$, $\eta^2 = .206$, 90% CI [.126, .286]), affect valence ($F[1, 191] = 86.89$, $p < .001$, $\eta^2 = .313$, 90% CI [.225, .391]), and time ($F[1, 191] = 11.91$, $p = .001$, $\eta^2 = .059$, 90% CI [.016, .119]). They also included significant two-way interactions between event type and affect

valence ($F[1, 191] = 38.38$, $p < .001$, $\eta^2 = .167$, 90% CI [.094, .245]), and affect valence and time ($F[1, 191] = 13.56$, $p < .001$, $\eta^2 = .066$, 90% CI [.020, .129]). We followed the same analytic strategy as in Experiment 1 to partition the crucial Event Type \times Affect Valence \times Time interaction.

Fading affect bias: Affect Valence \times Time interaction in the neutral-event condition and the nostalgic-event condition. In the neutral-event condition, the Affect Valence \times Time interaction was not significant, $F(1, 191) = 0.01$, $p = .942$, $\eta^2 = .000$, 90% CI [.000, .005]. Instead, the analysis revealed two main effects in this condition. A significant affect-valence effect indicated that neutral events elicited more positive than negative affect (i.e. a positivity offset), $F(1, 191) = 4.81$, $p = .030$, $\eta^2 = .025$, 90% CI [.001, .071]. A significant time effect indicated that neutral events elicited more (positive and negative) affect at recall than at occurrence; $F(1, 191) = 5.96$, $p = .016$, $\eta^2 = .030$, 90% CI [.003, .080].

In the nostalgic-event condition, the Affect Valence \times Time interaction was significant, $F(1, 191) = 26.78$, $p < .001$, $\eta^2 = .123$, 90% CI [.059, .196]. We probed this interaction by testing the simple effect of time within each level of valence. Positive affect was significantly lower (i.e. faded) at event recall than at event occurrence, $F(1, 191) = 6.14$, $p = .014$, $\eta^2 = .031$, 90% CI [.003, .081]. In contrast, negative affect increased from occurrence to recall, $F(1, 191) = 21.06$, $p < .001$, $\eta^2 = .100$, 90% CI [.042, .169].

Results in the nostalgic-event condition replicated Experiment 1’s findings. Consistent with H1, nostalgic events were characterised by a decrease in positive affect and an increase in negative affect over time. In the neutral-event condition, however, results did not replicate the FAB pattern observed for ordinary events in Experiment 1. We return to this discrepancy in the Discussion.

Table 5. Mean positive and negative affect ratings and standard deviations (in parentheses) as a function of event type (nostalgic, neutral) and time (event occurrence, event recall): Experiment 2.

	Nostalgic event		Neutral event	
	Occurrence	Recall	Occurrence	Recall
Positive affect	5.78 (1.80)	5.39 (1.90)	3.27 (1.69)	3.61 (1.94)
Negative affect	2.22 (1.94)	3.30 (2.30)	2.69 (1.60)	3.05 (1.84)

Table 6. Means and standard deviations (in parentheses) for discrete positive and negative emotions as a function of event type (nostalgic, neutral) and time (event occurrence, event recall): Experiment 2.

	Nostalgic event		Neutral event	
	Occurrence	Recall	Occurrence	Recall
Positive emotions				
Pride	4.15 (2.36)	4.18 (2.32)	2.56 (1.90)	2.56 (2.04)
Self-compassion	3.10 (1.95)	3.21 (1.97)	2.11 (1.56)	2.13 (1.73)
Gratitude	4.98 (2.19)	5.44 (1.91)	2.76 (2.07)	2.65 (2.05)
Inspiration	4.70 (2.13)	4.32 (2.09)	2.78 (1.99)	2.47 (1.97)
Passion	4.58 (2.11)	3.98 (2.08)	2.20 (1.75)	2.27 (1.92)
Negative emotions				
Guilt	1.77 (1.59)	2.18 (1.82)	1.76 (1.47)	1.61 (1.17)
Embarrassment	1.93 (1.64)	1.86 (1.63)	1.90 (1.70)	1.72 (1.44)
Shame	1.74 (1.60)	1.85 (1.56)	1.79 (1.51)	1.50 (1.22)
Hurt feelings	1.98 (1.79)	2.37 (1.96)	1.86 (1.66)	1.69 (1.34)
Unrequited love	3.12 (2.43)	3.18 (2.29)	1.68 (1.46)	1.69 (1.50)
Loneliness	1.91 (1.78)	2.67 (2.08)	1.93 (1.63)	1.64 (1.30)
Loss	2.11 (1.96)	3.34 (2.28)	1.80 (1.56)	1.74 (1.43)
Regret	2.02 (1.88)	2.90 (2.25)	2.05 (1.77)	1.86 (1.52)

Hedonic character of nostalgia: Event Type × Time interaction for positive affect and for negative affect. For positive affect, the Event Type × Time interaction was significant, $F(1, 191) = 10.55, p = .001, \eta^2 = .052, 90\% \text{ CI } [.013, .111]$. Tests of simple event-type effects revealed that, at occurrence, nostalgic (compared to neutral) events were higher in positive affect, $F(1, 191) = 98.76, p < .001, \eta^2 = .341, 90\% \text{ CI } [.253, .418]$. At recall, nostalgic (compared to neutral) events were also higher in positive affect, but the difference was smaller, $F(1, 191) = 41.46, p < .001, \eta^2 = .178, 90\% \text{ CI } [.103, .257]$.

For negative affect, the Event Type × Time interaction was also significant, $F(1, 191) = 4.60, p = .033, \eta^2 = .024, 90\% \text{ CI } [.001, .069]$. The pattern was complementary to the one observed for positive affect (i.e. a larger difference favouring nostalgic over neutral events at occurrence than at recall). Specifically, at occurrence, nostalgic (compared to neutral) events were trending lower in negative affect, $F(1, 191) = 3.38, p = .068, \eta^2 = .017, 90\% \text{ CI } [.000, .059]$. At recall, nostalgic events did not differ significantly from neutral ones on negative affect, $F(1, 191) = 0.66, p = .419, \eta^2 = .003, 90\% \text{ CI } [.000, .030]$.

As in Experiment 1, nostalgic (compared to neutral) events elicited more positive affect, particularly at occurrence but also at recall. Nostalgic (compared to neutral) events also tended to elicit less negative affect at occurrence, but not at recall.

Change in discrete positive emotions and in discrete negative emotions

For each discrete emotion, we conducted a 2 (Event Type: nostalgic, neutral) × 2 (Time: event occurrence, event recall) mixed ANOVA. Event type was a

between-subjects variable and time was a within-subjects variable. We present descriptive statistics in Table 6 and inferential statistics in Table 7.

Discrete positive emotions. Results revealed significant event-type main effects on all five discrete positive emotions. Overall, nostalgic (compared to neutral) events elicited more pride, self-compassion, gratitude, inspiration, and passion. The time main effect was significant for inspiration and passion, with both emotions fading from event occurrence to event recall. Further, we found significant Event Type × Time interaction effects on gratitude and passion. We partitioned these interactions, first, by testing the simple time effect within each level of event-type (i.e. for nostalgic and neutral events). Next, we tested the simple event-type effect within each level of time (i.e. at occurrence and at recall). We present tests of simple time effects in Table 8 and tests of simple event-type effects in Table 9.

The time effect on gratitude was not significant in the neutral-event condition but was significant in the nostalgic-event condition. In this latter condition, the gratitude associated with nostalgic events intensified from occurrence to recall. The event-type effect was significant at occurrence and at recall. Examination of the means shows that nostalgic (compared to neutral) events were associated with more gratitude, particularly at recall.

Passion produced a different pattern. The time effect was not significant in the neutral-event condition but was significant in the nostalgic-event condition. The means for this latter effect showed that the passion associated with nostalgic events faded from occurrence to recall. Thus, nostalgic (compared

Table 7. ANOVA results for discrete positive and negative emotions: Experiment 2.

	Event type				Time				Event Type × Time			
	<i>F</i>	<i>p</i>	η^2	90% CI	<i>F</i>	<i>p</i>	η^2	90% CI	<i>F</i>	<i>p</i>	η^2	90% CI
Positive emotions												
Pride	26.62	<.001	.124	.059, .198	0.02	.890	.000	.000, .009	0.02	.890	.000	.000, .009
Self-compassion	20.28	<.001	.096	.039, .165	0.30	.583	.002	.000, .024	0.14	.707	.001	.000, .019
Gratitude	87.82	<.001	.315	.227, .393	2.04	.155	.011	.000, .047	5.18	.024	.026	.002, .074
Inspiration	49.21	<.001	.205	.125, .284	8.11	.005	.041	.007, .095	0.11	.735	.001	.000, .017
Passion	64.05	<.001	.251	.167, .331	4.37	.038	.022	.001, .068	7.17	.008	.036	.005, .089
Negative emotions												
Guilt	2.21	.138	.011	.000, .048	1.79	.182	.009	.000, .044	8.21	.005	.041	.007, .096
Embarrassment	0.14	.707	.001	.000, .019	1.87	.174	.010	.000, .045	0.36	.551	.002	.000, .025
Shame	0.61	.436	.003	.000, .029	1.03	.313	.005	.000, .035	5.15	.024	.026	.002, .074
Hurt feelings	3.14	.078	.016	.000, .057	1.34	.249	.007	.000, .039	8.50	.004	.043	.008, .098
Unrequited love	29.98	<.001	.136	.068, .211	0.14	.712	.001	.000, .019	0.07	.794	.000	.000, .015
Loneliness	5.11	.025	.026	.002, .074	5.16	.024	.026	.002, .074	24.58	<.001	.114	.052, .186
Loss	16.27	<.001	.078	.028, .144	22.73	<.001	.106	.047, .178	27.10	<.001	.124	.060, .198
Regret	4.29	.040	.022	.001, .067	7.91	.005	.040	.007, .094	19.36	<.001	.092	.037, .161

Note: Denominator degrees of freedom vary from 188 to 192 due to missing values.

to neutral) events were associated with more passion at both occurrence and recall, but this event-type effect was larger at occurrence.

Discrete negative emotions. We obtained significant event-type main effects on four discrete negative emotions. Overall, nostalgic (compared to neutral) events elicited more unrequited love, loneliness, loss, and regret. The main effect of time was significant for loneliness, loss, and regret, with these emotions intensifying from occurrence to recall. Additionally, we obtained significant Event Type × Time interaction effects on guilt, shame, hurt feelings, loneliness, loss, and regret. We again partitioned these interactions by testing simple time effects within levels of event type (Table 8), and simple event-type effects within levels of time (Table 9).

The discrete emotions of guilt, hurt feelings, loneliness, loss, and regret yielded similar results. The time effect was not significant for neutral events but was significant for nostalgic events. The negative emotions associated with nostalgic events intensified from occurrence to recall. Moreover, nostalgic (compared to neutral) events were associated with significantly higher levels of these negative emotions at recall, but not at occurrence.

Shame produced a different pattern. Unlike the other negative emotions, the time effect was not significant for nostalgic events, but it was significant for neutral events. The shame associated with neutral events faded from occurrence to recall. Similar to the other negative emotions, nostalgic (compared to

Table 8. Simple time effects in the nostalgic-event and neutral-event conditions: Experiment 2.

	Time effect in nostalgic-event condition				Time effect in neutral-event condition			
	<i>F</i>	<i>p</i>	η^2	90% CI	<i>F</i>	<i>p</i>	η^2	90% CI
Positive emotions								
Pride	0.04	.844	.000	.000, .012	0.00	1.00	.000	.000, .000
Self-compassion	0.44	.509	.002	.000, .027	0.01	.903	.000	.000, .005
Gratitude	7.04	.009	.036	.005, .088	0.35	.555	.002	.000, .025
Inspiration	5.16	.024	.026	.002, .074	3.10	.080	.016	.000, .057
Passion	11.48	<.001	.057	.015, .117	0.17	.680	.001	.000, .020
Negative emotions								
Guilt	9.11	.003	.046	.009, .102	1.13	.289	.006	.000, .037
Embarrassment	0.30	.583	.002	.000, .024	1.88	.172	.010	.000, .045
Shame	0.82	.368	.004	.000, .033	5.22	.023	.027	.002, .074
Hurt feelings	8.51	.004	.043	.008, .098	1.51	.221	.008	.000, .041
Unrequited love	0.20	.653	.001	.000, .021	0.01	.939	.000	.000, .005
Loneliness	26.55	<.001	.122	.058, .195	3.55	.061	.018	.000, .061
Loss	51.07	<.001	.211	.131, .290	0.09	.760	.000	.000, .016
Regret	26.85	<.001	.123	.059, .197	1.22	.270	.006	.000, .038

Note: Denominator degrees of freedom vary from 188 to 192 due to missing values.

Table 9. Simple event-type effects at event occurrence and at event recall: Experiment 2.

	Event-type effect at occurrence				Event-type effect at recall			
	<i>F</i>	<i>p</i>	η^2	90% CI	<i>F</i>	<i>p</i>	η^2	90% CI
Positive emotions								
Pride	25.83	<.001	.121	.057, .195	25.85	<.001	.121	.057, .195
Self-compassion	15.31	<.001	.074	.025, .139	16.55	<.001	.080	.029, .146
Gratitude	52.66	<.001	.216	.135, .296	96.49	<.001	.336	.248, .413
Inspiration	42.12	<.001	.181	.105, .259	39.55	<.001	.172	.097, .250
Passion	72.30	<.001	.276	.189, .355	34.87	<.001	.155	.083, .232
Negative emotions								
Guilt	0.00	.947	.000	.000, .001	6.75	.010	.034	.005, .085
Embarrassment	0.01	.917	.000	.000, .005	0.37	.543	.002	.000, .025
Shame	0.04	.833	.000	.000, .013	3.01	.084	.015	.000, .056
Hurt feelings	0.23	.635	.001	.000, .022	7.89	.006	.040	.007, .094
Unrequited love	24.65	<.001	.114	.052, .187	28.49	<.001	.130	.064, .204
Loneliness	0.01	.941	.000	.000, .002	16.97	<.001	.082	.030, .148
Loss	1.52	.219	.008	.000, .042	33.26	<.001	.150	.079, .226
Regret	0.02	.899	.000	.000, .007	13.92	<.001	.068	.022, .132

Note: Denominator degrees of freedom vary from 188 to 192 due to missing values.

neutral) events were associated (trendingly) with more shame at recall, but not at occurrence.

H3: mediation analyses

We ran two sets of mediation analyses. In the first set, reported below, we examined whether changes from event occurrence to event recall in the 13 measured discrete emotions plausibly mediated affect change over time (H3). Affect change was a within-subjects effect. Thus, to examine mediation of this effect, we used the MEMORE macro (Montoya & Hayes, 2017), which generalises the product-of-paths approach that is commonly used to test the indirect effect in between-subjects designs (Hayes, 2022; MacKinnon et al., 2004) to the within-subjects version of mediation analysis. In this set of analyses, we focused on mediation of the time effects in the nostalgic-event condition. The time effect in the neutral-event condition was significant for a single discrete emotion only – the shame associated with neutral events faded over time (Table 8, under “Time effect in neutral-event condition”). However, total affect associated with neutral events intensified over time, irrespective of valence. Thus, shame did not qualify as a plausible mediator of affect change in the neutral-event condition, nor did any other discrete emotion.

In the second set of analyses, reported in Supplemental Material, we examined mediation of the event-type effect on positive affect by discrete emotions. We focused on positive affect, because the event-type effect on negative affect was not significant either at event occurrence or at event recall. Positive affect was higher in the nostalgia than neutral control condition at event occurrence and at

event recall. In both instances, this event-type effect was mediated by pride, gratitude, and inspiration (Supplemental Material, Tables S3–S4, parallel mediation analyses).

Mediation of decreasing positive affect associated with nostalgic events

Seven discrete emotions evinced a significant time effect that followed the fading of global positive affect associated with nostalgic events: The positive emotions of inspiration and passion faded over time, and the negative emotions of guilt, hurt feelings, loneliness, loss, and regret intensified over time (Table 8, under “Time effect in nostalgic-event condition”). Simple mediation analyses indicated that the fading of positive affect associated with nostalgic events was plausibly mediated by the fading of inspiration and passion, as well as by the intensification of hurt feelings, loneliness, and regret (Table 10). Parallel mediation analysis involving these five variables revealed a mediating role for intensified regret only (Table 10). The fading of positive affect associated with nostalgic events was plausibly mediated by intensification of regret from event occurrence to event recall.

Mediation of increasing negative affect associated with nostalgic events

The same discrete emotions that followed the fading of positive affect also matched the intensification of negative affect associated with nostalgic events. Simple mediation analyses revealed a role for loneliness only, so we therefore did not conduct parallel

Table 10. Mediation of time effects on positive and negative affect associated with nostalgic events by discrete emotions: Experiment 2.

Effect	Analysis	Mediating effect						
		Fading of			Intensification of			
		Inspiration	Passion	Guilt	Hurt feelings	Loneliness	Loss	Regret
Fading of PA	Simple	0.13*	0.15*	0.08	0.19*	0.22*	0.14	0.34*
Fading of PA	Parallel	0.06	0.08		0.12	-0.10		0.31*
Intensification of NA	Simple	0.05	0.00	0.05	0.08	0.23*	0.15	0.06

Note: Tabled values are unstandardised indirect effects. Simple denotes simple mediation analyses with a single mediator. Parallel denotes parallel mediation analyses in which all significant simple mediators were entered simultaneously. Asterisks (*) indicate statistically significant indirect effects. Indirect effects are statistically significant when their bootstrapped 95% confidence interval does not include zero. We present these 95% confidence intervals in Supplemental Material, Table S2. PA = positive affect. NA = negative affect.

mediation analyses (Table 10). The intensification of negative affect associated with nostalgic events was plausibly mediated by intensification of loneliness from event occurrence to event recall.

Inconsistent mediation by gratitude

One discrete positive emotion evinced a pattern that did not match the fading of positive affect or the intensification of negative affect associated with nostalgic events: gratitude intensified over time (Table 8). Tests of indirect effects revealed that gratitude inconsistently mediated (or suppressed; MacKinnon et al., 2000) the fading of positive affect associated with nostalgic events, indirect effect = -0.085 , 95% CI = $[-0.231, -0.014]$, as well as the intensification of negative affect associated with nostalgic events, indirect effect = -0.151 , 95% CI = $[-0.423, -0.019]$.

Discussion

Replicating Experiment 1 findings, Experiment 2's results indicated that nostalgic events were characterised by a decrease in positive affect and an increase in negative affect over time. These temporal changes in affect were mediated by parallel changes in certain discrete negative emotions associated with nostalgia. Specifically, the fading of positive affect associated with nostalgic events was plausibly mediated by intensification of regret, and the intensification of negative affect associated with nostalgic events was plausibly mediated by intensification of loneliness. Gratitude was a notable exception. Unlike other discrete positive emotions, gratitude associated with nostalgic events grew over time, supporting the notion that "gratitude ... is almost always felt in retrospection" (Emmons & Mishra, 2011, p. 256).

Also consistent with Experiment 1, nostalgic (compared to neutral) events were linked to more positive affect, particularly at occurrence but also at recall. At

both occurrence and recall, the relative positivity of nostalgic (compared to neutral) events was due to greater pride, gratitude, and inspiration evoked by nostalgic events (for details, see Supplemental Material).

The pattern of affect change associated with neutral events in Experiment 2 did not replicate the FAB pattern observed for ordinary events in Experiment 1. The key discrepancy between the two experiments relates to the change in negative affect associated with control events; it faded in Experiment 1 but intensified in Experiment 2 (the numerical pattern for positive affect indicated modest intensification in both experiments). Findings for the discrete negative emotion of inspiration hint at a possible explanation for the intensification of negative affect associated with neutral events in Experiment 2. Specifically, there was a trend toward fading of inspiration associated with neutral events (Table 8, under "Time effect in neutral-event condition"). Perhaps, then, participants found recalling specific, neutral events uninspiring and boring (van Tilburg et al., 2013). As noted in the Introduction, deviations from the typical FAB pattern for various specific event types have been documented frequently (Skowronski et al., 2014).

General discussion

Our findings make several contributions to the literature. They elucidate not only nostalgia's affective signature, but also its temporal trajectory and the implications of this trajectory for the subsequent psychological benefits. Remembering nostalgic events entails pensive contemplation of a "never-to-be-regained past" (Beiser & Wickrama, 2004, p. 909) and confrontation with the remorseless passage of time. Indeed, our findings demonstrate that, whereas nostalgic events conjured almost exclusively positive affect at the time they occurred, positive

affect had faded and negative affect intensified by the time these events were recalled, affirming H1. Nonetheless, even when recalled, nostalgic events were rated as more positive than ordinary (Experiment 1) and neutral (Experiment 2) control events.

Speaking to H2, Experiment 1's findings suggest that this relative positivity of nostalgic events may partially account for its psychological benefits. Specifically, mediation analyses supported a serial process model according to which nostalgic (compared to ordinary) events evoke more positive affect at the time they occur and, consequently, generate more positive affect when recalled, thereby exerting beneficial effects (Figure 1(b)). Yet, apart from self-esteem, nostalgia also had a significant direct effect on all psychological benefits, indicating that the mediational pathway was sufficient but not necessary to produce psychological benefits. These findings are consistent with evidence that nostalgia confers greater psychological benefits than does recollection of a positive past event (Stephan et al., 2015; Weingarten et al., 2025; Wildschut & Sedikides, 2025).

Regarding H3, the findings illustrate how temporal trajectories of global affect associated with nostalgia can be explained by corresponding changes over time in discrete negative emotions. Specifically, increases over time in regret and loneliness mediated, respectively, the fading of positive affect and intensification of negative affect associated with nostalgic events. By examining discrete emotions, we also clarified the consistent finding that nostalgic events evoke more positive affect than ordinary (Experiment 1) and neutral (Experiment 2) events, both at the time they occurred and when recalled. Specifically, in Experiment 2, parallel mediation analyses revealed that the relative positivity associated with nostalgic events was linked to three discrete positive emotions: the self-oriented emotion of pride (van Tilburg et al., 2018), the social emotion of gratitude (Li et al., 2023), and the approach-oriented emotion of inspiration (Stephan et al., 2015).

Whereas the specific discrete emotions identified as plausible mediators are promising targets for future research, it is prudent to interpret these findings with caution, for at least three reasons. First, the findings were exploratory and are in need of replication. Second, statistical significance is a function of sample size, and additional discrete emotions may turn out to be influential when tested in a larger sample. Third, the set of discrete emotions examined was not exhaustive. Future research may

show that other discrete emotions, such as admiration (Onu et al., 2016) and awe (Keltner & Haidt, 2003), which we did not consider, play an important role.

Given that we used a retrospective recall methodology in our studies, some scholars might question the “temporal trajectory” interpretation of our results. Some might claim, for instance, that retrospective ratings of the affective qualities of events at their occurrence are subject to recall errors and biases, and thus do not reflect actual affect change. This assertion runs into a big data-based roadblock. Many studies of the FAB have used prospective methods (e.g. diary studies) in which the affect prompted by events is assessed at, or near to, the time of event occurrence (for a review, see Skowronski et al., 2014). Studies employing this design find affect change patterns that are similar to the affect patterns observed in studies that employ the retrospective recall method. This does not preclude the possibility that retrospective recall may sometimes be biased, but the convergent validity in prospective and retrospective methods makes it difficult for the biased-recall argument to explain our findings and strongly supports our “temporal trajectory” interpretation.

Limitations and future research directions

We used measurement-of-mediation design in Experiments 1 and 2. In such designs, the mediator and outcome variable are both measured and, hence, associations between them are purely correlational and do not allow strong causal inferences (Fiedler et al., 2018). Nonetheless, the design can be informative, because it puts the mediational prediction at risk (Fiedler et al., 2011). Future research could address these limitations by harnessing alternative avenues for testing mediation, as offered by experimental-causal-chain and moderation-of-process designs (Spencer et al., 2005; Wildschut & Sedikides, 2023). In addition, as argued previously, the findings (including mediational ones) of momentary ecological assessment studies duplicate those of retrospective designs (Skowronski et al., 2014).

Also, we relied on the event reflection task to prompt recall of nostalgic (and control) events. Whereas this frequently used task successfully induces nostalgia across cultures (Hepper et al., 2024), we acknowledge that methodological diversity is a prerequisite for valid causal inferences, and recommend that researchers take advantage of the entire range of extant nostalgia inductions to meet

this objective, including ones based on music and song lyrics (Cheung et al., 2013), smells (Reid et al., 2015), tastes (Reid et al., 2023), photographs (Yang et al., 2021), prototype features (Hepper et al., 2012), and interactive, life-like virtual environments (Oliver et al., 2024; Redhead et al., 2023).

By assessing a comprehensive set of discrete, self-relevant emotions, Experiment 2 offered unique and novel insights into the affective signature of nostalgia. Nostalgic (compared to neutral) events, when recalled, evoked distinctly bittersweet feelings; elevated pride, self-compassion, gratitude, inspiration, and passion were mixed with increased guilt, hurt feelings, unrequited love, loneliness, loss, and regret. Still, these findings should be interpreted in view of the low emotional intensity associated with the recollection of neutral events. Future studies could compare nostalgia with other benchmarks, such as instructing control participants to recall either a positive or negative autobiographical event, to identify the specific discrete emotions that are uniquely associated with nostalgia.

Coda

In reflecting on our findings, a pivotal unresolved question beckons. Events do not start out as nostalgic; they become nostalgic over time. Which experiences have the potential to later become nostalgic and what drives this transformation? Untying this Gordian Knot is a high priority for future research.

Notes

1. Preliminary analyses revealed only a single significant effect involving gender in Experiment 1 and only two such effects in Experiment 2. We therefore did not include gender in the final analyses but report the three significant effects in Supplemental Material.
2. Given that the *F* distribution is one-sided (Steiger, 2004), we report 90% confidence intervals for eta squared. This ensures that inferences based on *p*-values will agree with the lower confidence limit.
3. We did not conduct mediation analyses with difference scores as mediators, because results of such analyses would be difficult to interpret. For example, we could calculate a difference score, such that higher values reflect a greater reduction in positive affect over time (difference score = positive affect at occurrence – positive affect at recall), and then treat this variable as mediator. However, this difference score would be positively correlated with positive affect at occurrence and negatively correlated with positive affect at recall. These confounds obscure interpretation of findings involving the

difference score. Hence, we focused on the individual component scores (i.e. positive and negative affect at occurrence and at recall).

4. We also assessed how long ago the recalled event took place and how difficult it was to remember the event. We report relevant results in Supplemental Material.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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