The Topics of Nostalgic Recall:

The Benefits of Nostalgia Depend on the Topics that One Recalls

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Data, Code, and Materials are available:
https://osf.io/qjkrs/?view_only=6ccec1606f3c47c88a5931b3c4ecc843
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ABSTRACT

This research explores the intricate realm of nostalgia, employing advanced language analysis and the Event Reflection Task to systematically dissect the process of nostalgic recall. Through this methodological approach, distinct thematic elements are identified across 10 datasets ($N =$ 2038). Eight recurrent topics in nostalgic content are unveiled, ranging from Family and Positive Affect to Longing and Place. The interplay of these thematic categories with the psychological consequences of nostalgia reveals a complex and multifaceted pattern. Notably, themes associated with positive affect exhibit a capacity to yield a plethora of favorable psychological outcomes, while those intertwined with negative emotion are bittersweet. This investigation paves the way for inquiries into potential cross-cultural disparities, the diversification of manipulation techniques, and the application of sophisticated analytical methodologies. As nostalgia's dimensions continue to unfold, its implications widen, inviting researchers to unearth the profound depths of emotion and cognition entwined in the reverie of reminiscence.

INTRODUCTION

Despite its benefits, nostalgia is a bittersweet emotion, often blending both positive and negative affect (Sedikides et al., 2015). Most psychologists follow The New Oxford Dictionary's definition of nostalgia as "a sentimental longing or wistful affection for the past" (Pearsal, 1998, p.1266). Consistent with this, Hepper et al. (2012) investigated lay-persons' conception of nostalgia in depth, finding that most people view nostalgia as predominately positive and social. Yet, like the dictionary definition, there is some negative emotional content in these conceptions (Leunissen et al., 2020; Sedikides & Wildschut, 2016). Where there is "wistful affection," there is also "longing." Studies of the affective qualities of nostalgic experiences further solidify the bittersweet nature of the emotion (Wildschut et al., 2006).

Research on nostalgia has grown rapidly since the mid-aughts. Contrary to early ideas of nostalgia as pathological thinking or neurological disease (Havlena & Holak, 1991; McCann, 1941), empirical studies find that nostalgia has predominantly positive outcomes (for a history, see Sedikides et al., 2015). Nostalgia has been associated with increases in feelings of social connection (Sedikides & Wildschut, 2019), a sense of meaning in life (Sedikides & Wildschut, 2018), self-continuity (Sedikides et al., 2016), self-esteem (Vess et al., 2012), inspiration (Stephan et al., 2015), and optimism (Cheung et al., 2013). In sum, nostalgia confers a broad set of positive psychological outcomes.

Researchers have probed the cognitive and neural mechanisms underlying nostalgia's social, existential, and self-oriented benefits. Evans et al. (2021), for example, found that conjuring nostalgic memories amplifies benefits by mentally placing individuals within the memory's setting. Moreover, nostalgic thinking activates brain regions associated with

autobiographical recall, self-reflection (Yang et al., 2022a), emotion regulation, and reward processing, contributing to nostalgia's threat mitigation effects (Yang et al., 2022b).

The Shape and Substance of Nostalgia

While several benefits as well as neural and cognitive mechanisms of nostalgia are well-documented, little work has examined the *substance* of nostalgic recall. One of the most common, gold-standard manipulations of nostalgia is the event reflection task (ERT; Sedikides et al., 2015), wherein participants write about either a nostalgic or an ordinary autobiographical memory. The ERT instructs participants to recall *any* nostalgic memory, seldom prescribing the topic of nostalgic recall (for an exception, see Evans et al., 2022).

Such an exercise provides a rich stream of psychological information that can provide clues into the workings of a person's psychology (Tausczik & Pennebaker, 2010). While this data is most typically treated as a byproduct of the research process,[1] the language of nostalgic recall may provide clues to the substance and topography of the emotion itself: Which content areas or topics of nostalgia confer which benefits? Do all possible topics contribute positively or negatively to each of the outcomes? Do known aspects of nostalgic recall generalize and, if so, contribute to the benefits of nostalgia? If so, *how*? Given the amount of research on nostalgia and its outcomes, the pursuit of a more granular view of its psychological makeup and, subsequently, nostalgia's unique contributions to its functions, represent a great leap forward.

Recently, there have been rapid advances in psychological text analysis and natural language processing methods, ranging from dictionary-based methods—such as the Linguistic

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[1] A notable exception was Wildschut et al. (2006). They found that nostalgic recall often involved close others, momentous life events, objects of affection, and places. They also reported that the "self" was often at the center of the memories. For emotional content, the results again reflected the mostly positive, but still bittersweet nature of nostalgia.

Inquiry and Word Count software (LIWC-22; Boyd et al., 2022), which has been used to test the "nostalgicity" of autobiographical narratives (Chen et al., 2023)—to complex transformer-based models, such as BERT and GPT-4 (see: Kennedy et al., 2022, for a comprehensive review). One family of methods known as topic modeling is especially well-suited to our research goals. By leveraging computerized methods for topic modeling, it is possible to extract and quantify psychologically meaningful "themes" from a collection of text, providing psychological data that can match, and often surpass, limitations of human coders and self-report questionnaires (see: Boyd et al., 2020; Boyd & Pennebaker, 2017). By leveraging modern computational methods, our goal is to obtain an objective, data-driven analysis of the content of nostalgic recall, facilitating insights into how the *substance* of nostalgia connects with the *outcomes* of nostalgia.

Topic modeling is fundamentally data-driven, extracting naturally occurring themes in writing samples (Markowitz, 2021). Consequently, making specific predictions about emerging topics and their potential relationships with outcomes requires caution. However, theoretical insights offer guidance. Nostalgia being a self-focused social emotion (Wohl et al., 2023) suggests a likelihood of social themes. Focusing on such social themes could contribute to feelings of social connection, a key outcome of nostalgia (Juhl & Biskas, 2023). Given the inherently social nature of humans (Baumeister & Leary, 1995), reflections on social experiences also likely play a role in shaping one's sense of meaning in life, a fundamental aspect of nostalgia (Abeyta & Pillarisetty, 2023).

Nostalgic recall encompasses reflections on both the central features of the memory and peripheral aspects, such as the emotions evoked during recollection (Hepper et al., 2012; Stephan et al., 2012). This implies a likelihood of topics related to one's emotional experience during recall, including feelings of longing or nostalgia itself. Drawing from prior research (Stephan et

al., 2012; Stephan & Sedikides, 2023), it is plausible that such a focus on one's current experience may hinder nostalgia's benefits. However, we underscore the exploratory nature of this study and maintain an agnostic stance toward specific topics and their relationships.

Open Practices Statement

Data, materials, and analysis code are available via OSF and can be accessed at https://osf.io/qjkrs/?view_only=6ccec1606f3c47c88a5931b3c4ecc843. The data were archival. The data used for the current study reflects a comprehensive collection of studies that the first author has run using the standard ERT at the time of this writing. Since data collection was led by a single lab for purposes other than the current project, generalizability may be limited due to unknown methodological factors. The design and analyses were not preregistered. We based our final model on the most comprehensive model possible, including all variables that were collected in nearly every study[2] and the topics that were specific to nostalgia. Additional models (e.g., those including the ordinary topics) were not informative — our research question involved only the topics of nostalgic recall and their connection to nostalgia's functions.

Method

Participants

Participant information, data collection sites, and data collection details are in Table 1. Because we used existing data, we did not have a sampling plan.

Procedures and Materials

In all studies, participants completed the standard ERT (Sedikides et al., 2015; Wildschut et al., 2006), which is the gold-standard nostalgia manipulation upon which the entire nostalgia literature rests. Participants first read one of two (Nostalgia vs. Ordinary) sets of instructions (see

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[2] We explored models using variables within a subset of the samples for purposes orthogonal to the current investigation. That data is available.

the OSF page for exact materials) and then write about an autobiographical event. The length of time that participants spent writing varied across studies (see Table 1). Once participants completed the ERT, they completed various outcome measures, depending on the study (see Table 1 for exclusions). Any additional measures or procedures across the studies were completed separately from the standard ERT.

Table 1

Participant and Study Information for Studies A-J

Study	N	Female	Male	M_{age}	SD_{age}	Writing Time	Collection Site	Variables Excluded	Purpose	Published
A	176	75	101	37.34	11.48	2 minutes	mTurk		ESRM	Unpublished
B	174	89	85	36.89	12.71	3 minutes	mTurk		SRME	[REDACTED A]
C	195	82	113	35.13	11.36	2 minutes	mTurk		ESRM	Unpublished
D	195	123	72	20.81	4.39	2 minutes	University of [REDACTED A]		SRME	[REDACTED A]
E	195	149	46	20.19	3.75	2 minutes	University of [REDACTED A]		ESRM	Unpublished
F	100	78	22	21.19	4.87	4 minutes	University of [REDACTED A]		CNW	Unpublished
G	101	NA	NA	NA	NA	4 minutes	University of [REDACTED A]		CNW	Unpublished
H	200	155	41	21.94	5.46	250 word minimum	University of [REDACTED B]	Self-esteem, optimism, inspiration, positive & negative emotion	LA	Unpublished
I	549	111	428	20.91	3.33	3 minutes	University of [REDACTED B]	Self-esteem, optimism, inspiration, positive & negative emotion	ESRM	Unpublished
J	153	115	37	20.58	2.79	4 minutes	University of [REDACTED B]		CNW	Unpublished

Note: ERT = Event Reflection Task; Writing Time = Writing time in the ERT; ESRM = Exploring Self-Reported Moderator; SRME = Self-Reported Mental Experience; CNW = Comparing ERT to Non-Writing manipulation (only data from ERT included); LA = Language Analyses.

Felt Nostalgia

In all studies, we included two statements measuring experienced nostalgia (e.g., "Right now, I am feeling quite nostalgic;" 1 = *strongly agree*, 5 = *strongly disagree*). These items are typically used as a standard manipulation check in the nostalgia literature (Sedikides et al., 2015; Sedikides & Wildschut, 2019, 2020). Analyzing them with the language data allows us to see which topics are most strongly predictive of the subjective *feeling* of nostalgia ($N = 2037$, $M = 3.68$, $SD = 1.24$, $\alpha = .96$).

Functions of Nostalgia

Participants completed measures shown to be consistently affected by nostalgia (Sedikides et al., 2015). Each measure includes 4 items. First, we assessed *social connectedness* (e.g., "I feel connected to loved ones"; $N = 2038$, $M = 4.38$, $SD = 1.62$, $\alpha = .91$; see Wildschut et al., 2006). Second, we assessed *meaning in life* (e.g., "I feel that life is meaningful;" $N = 2038$, $M = 5.45$, $SD = 1.46$, $\alpha = .93$; see Routledge et al., 2011). Third, we assessed *self-continuity* (e.g., "I feel connected with my past;" $N = 2038$, $M = 5.37$, $SD = 1.24$, $\alpha = .79$; see Sedikides et al., 2016). Fourth, we assessed *self-esteem* (e.g., "I feel good about myself;" $N = 1289$, $M = 5.18$, $SD = 1.39$, $\alpha = .91$; see Hepper et al., 2012). Fifth, we assessed *optimism* (e.g., "I feel optimistic about my future;" $N = 1289$, $M = 5.14$, $SD = 1.40$, $\alpha = .90$; see Cheung et al., 2013). Sixth, we assessed *inspiration* (e.g., "I feel filled with inspiration;" $N = 1289$, $M = 4.92$, $SD = 1.51$, $\alpha = .93$; see Stephan et al., 2015). We also measured positive (e.g., "I feel happy;" $N = 1289$, $M = 5.40$, $SD = 1.66$, $\alpha = .93$) and negative emotion (e.g., "I feel unhappy;" $N = 1289$, $M = 2.66$, $SD = 1.73$, $\alpha = .85$) using 2 face valid items developed by Wildschut et al. (2006; 2010).

Language Analysis

Modern language analysis techniques offer great potential for insight into these data. While dictionary-based language analysis tools, like the LIWC-22 software (Boyd et al., 2022), offer a top-down account for the types of words used in a writing sample, we opted for the meaning extraction method (MEM; Chung & Pennebaker, 2008; Markowitz, 2021). The MEM is a bottom-up language analysis technique that allows the data to do the talking. That is, through principal components analysis (PCA), the MEM identifies which words hang together, identifying topics rather than word categories. For example, a topic could contain positive emotion and family words. In the dictionary method, these word categories would be separate. Using the MEM, then, our goal was to identify the most common topics of nostalgic recall using the Even Reflection Task. We then used these extracted topics to identify which of the outcomes of nostalgia they predict and in what direction (i.e., positively or negatively).

To build our topic model we used the Meaning Extraction Helper (MEH; Boyd, 2018; for detailed technical descriptions of this process, see: Chung & Pennebaker, 2008; Markowitz, 2021). First, we took all narratives from the datafile and output them into separate text files. After uploading them into the Meaning Extraction Helper, it then converted common contractions into their separate full words and corrected common misspellings and lemmatized the words to their roots. We used the default stop list, removing words that typically provide no meaningful content, and set the minimum word count to 25. The MEH output our language dataset in a binary fashion (i.e., one-hot encoded) as a document–term matrix (DTM), where each word in the corpus was scored as 1 if a word was present and 0 if absent. This DTM was then submitted to a principal components analysis following standard recommendations for performing the meaning extraction method (see: Boyd, 2017; Markowitz, 2021).

Results

Topics of Nostalgia

We first conducted a parallel analysis (Horn, 1965) of the DTM using the "fa.parallel" function from the "psych" package (Revelle, 2023, v2.3.9). This parallel analysis suggested 16 components for the PCA. However, the MEM is an iterative process, one that prioritizes interpretability. Therefore, we conducted 3 PCAs with varimax rotation[3], extracting 14, 15, and 16 components. In assessing each solution, we deemed the 16-component solution to be the most interpretable and adopted that solution (for word loadings for each component, see SuppTable 1 in the Online Supplemental Materials). The 16 topics that we extracted are presented in Table 2.

Table 2
Topics, Example Words, and Frequencies of Topics by Condition

| Topic | Top Loading Example Words | Welch's t | | | | Nostalgia | Ordinary |
		t	p	Cohen's D	95% CI	$M(SD)$	$M(SD)$
Routine	wake, morning, bed, ready	-13.80	<.001	-0.62	[-0.71,-0.53]	-0.30(0.56)	0.29(1.23)
Work Week	pick, Friday, work, end	-11.99	<.001	-0.54	[-0.63,-0.45]	-0.26(0.86)	0.26(1.06)
Family	**mom, sister, dad, remember**	**14.01**	**<.001**	**0.63**	**[0.54,0.72]**	**0.30(1.11)**	**-0.30(0.77)**
Together	**together, spent, close, friend**	**6.35**	**<.001**	**0.28**	**[0.20,0.37]**	**0.14(1.10)**	**-0.14(0.87)**
School	**school, high, college, year**	**6.75**	**<.001**	**0.30**	**[0.22,0.39]**	**0.15(1.13)**	**-0.15(0.83)**
Play	**play, game, kid**	**4.79**	**<.001**	**0.21**	**[0.13,0.30]**	**0.11(1.13)**	**-0.11(0.84)**
Nostalgia	**nostalgic, memory, big**	**22.1**	**<.001**	**0.99**	**[0.90,1.08]**	**0.45(0.78)**	**-0.44(1.00)**
Music	music, listen, drive, car	-1.29	0.196	-0.06	[-0.15,0.03]	-0.03(0.88)	0.03(1.10)
PA	**love, excite, favorite, great**	**3.56**	**<.001**	**0.16**	**[0.07,0.25]**	**0.08(1.06)**	**-0.08(0.93)**
Food	food, eat, visit	-0.86	0.391	-0.04	[-0.13,0.05]	-0.02(0.99)	0.02(1.01)
Relax	sit, watch, relax, talk	-5.41	<.001	-0.24	[-0.33,-0.15]	-0.12(0.91)	0.12(1.07)
Longing	**sad, happy, long, thought**	**8.22**	**<.001**	**0.37**	**[0.28,0.46]**	**0.18(1.06)**	**-0.18(0.90)**
Instructions1	event, ordinary, life	-3.45	<.001	-0.15	[-0.24,-0.07]	-0.08(0.89)	0.08(1.10)
Place	**place, move, house, live**	**4.85**	**<.001**	**0.15**	**[0.07,0.24]**	**0.11(1.09)**	**-0.11(0.89)**
Stress	stress, mind, enjoy	-1.76	0.078	-0.08	[-0.17,0.00]	-0.04(0.96)	0.04(1.03)
Instructions2	**bring, memory**	**5.49**	**<.001**	**0.25**	**[0.16,0.33]**	**0.12(1.04)**	**-0.12(0.94)**

Note. Bolded topics indicate the ones most frequently present in the nostalgia (vs. ordinary) condition.
PA = Positive Affect.

[3] While varimax rotation is the preferred method for meaning extraction, we conducted the same principal components analysis using oblimin rotation. The resulting components were nearly identical, with the same words loading on nearly all the same components. Specifying the same SEM model with these factors did not significantly change our interpretations. Finally, intercorrelations between the nostalgia topics were typically low ($M_r = .09$). The largest correlation was small and between the "Play" and "Together" topics ($r = .14$). Overall, then, we stuck to our varimax rotated topics and models, which is consistent with past conclusions using this method (Chung & Pennebaker, 2008; Millar & Hunston, 2015).

Nine topics appeared more frequently in the nostalgia (vs. ordinary) condition: *Family*, *Together*, *School*, *Play*, *Nostalgia*, *Positive Affect*, *Longing*, *Place*, and *Instructions2*. The combination of positive affect and longing lends credence to the bittersweet nature of nostalgia. Four topics were more frequent in the ordinary recall condition compared to the nostalgia condition: *Routine*, *Work Week*, *Relax*, and *Instructions1*. The remaining topics did not significantly differ in their frequency between writing conditions but trended towards the ordinary condition[4].

The Indirect Path from Nostalgia to its Functions Through Language

We constructed two structural equation models (SEMs) using the "lavaan" package (Rosseel, 2012; v0.6-16) in R. Our goal with the first model was to explore which topics of nostalgia most influenced *feelings* of nostalgia. For the second model, we explored which topics of nostalgia most influenced the social, existential, and self-oriented outcomes of nostalgia, as well as emotion. As such, we only included the topics of nostalgia which were more frequent in the nostalgia condition compared to the ordinary condition in our models as our focus was solely on nostalgia. We also excluded the "Instructions2" topic, as this topic reflected participants restating the instructions in the nostalgia condition rather than the substance of the nostalgic recall itself.

The ERT involves instructing participants to 1) think about a nostalgic or ordinary autobiographical memory, then 2) write about that event (in which the topics of the autobiographical memory are shared), and 3) rate the extent to which they felt nostalgic as well as each of nostalgia's functions. Therefore, our SEM models followed this sequential path: 1)

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[4] The topics of *Music* and *Food* trended toward the ordinary condition. Music provides a strong evocation of nostalgia (Barrett et al., 2010), as does food (Reid et al., 2023). Participants in the ordinary conditions likely wrote about recent meals and listening to music in their daily lives more often than those in the nostalgia condition brought up nostalgic songs or food, likely a side effect of the writing instructions.

condition (nostalgia = 1; ordinary = 0) to 2) nostalgia topics to 3) outcomes: manipulation check (Model 1) and functions of nostalgia (Model 2). Moreover, we were interested in exploring the extent to which each of the topics facilitated the link between the nostalgia condition and the outcomes. Therefore, in addition to estimating each of the direct paths, we estimated the indirect effects of condition on the manipulation check (Model 1) and functions of nostalgia (Model 2) through each of the topics.

Model 1: Manipulation Check

First, regarding the manipulation check as the key outcome, we found that the condition significantly predicted all topics, as well as felt nostalgia (see Table 3). More interestingly, however, we found that participants who wrote about topics related to *Family*, *School*, and *Play*, as well as discussed feelings related to *Positive Affect* reported higher levels of felt nostalgia (see Figure 1). Moreover, each of these topics significantly mediated the association between condition and felt nostalgia. In other words, when instructed to write about a nostalgic (vs. ordinary) memory, participants tended to write about each of the nostalgia-related topics and ultimately felt more nostalgic, but only writing about topics related to *Family*, *School*, *Play*, and *Positive Affect* served as a mechanism facilitating the link between nostalgic *recall* and the actual experience of *feeling* nostalgic.

Figure 1

Significant Paths in Model 1
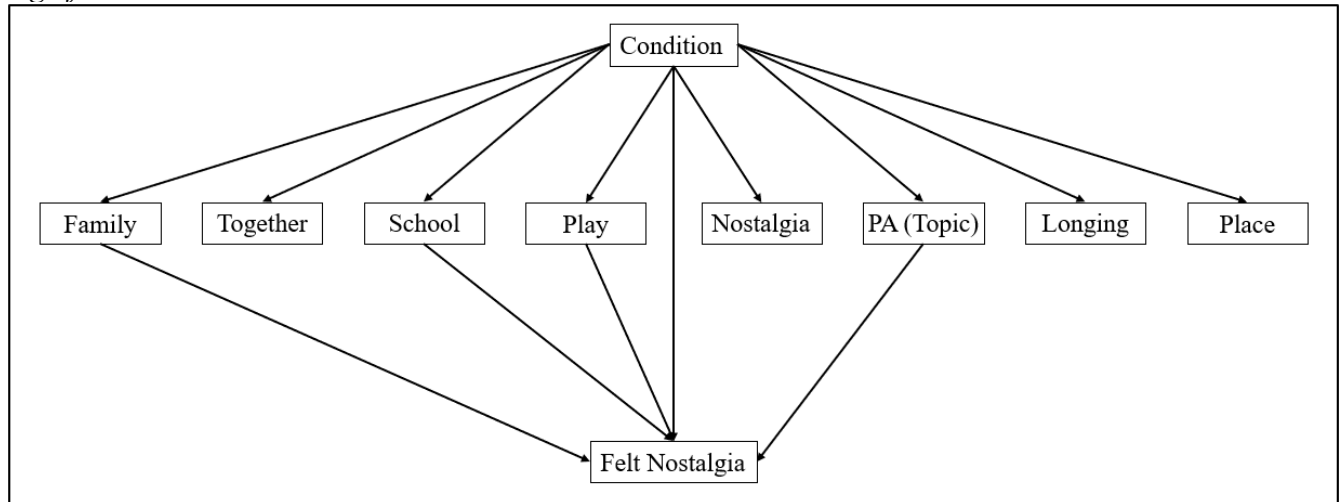
Note: "PA" = Positive Affect; Solid lines = + association at *p* < .05.

Table 3

Estimates of Direct, Indirect, and Total Effects for Model 1

Topic	a Path (Condition to Topic)		b Path (Topic to Felt Nostalgia)		c Path (Condition to Felt Nostalgia)		ab Path (Indirect Effect)		Total Effect	
	β	*b* [95% CI]	*β*	*b* [95% CI]	*β*	*b* [95% CI]	*β*	*b* [95% CI]	*β*	*b* [95% CI]
Family	.299***	.598 [.514, .682]	.063**	.078 [.027, .130]			.019**	.047 [.016, .078]		
Together	.141***	.281 [.195, .368]	.032	.040 [-.008, .087]			.005	.011 [-.002, .026]		
School	.150***	.300 [.213, .387]	.048*	.060 [.013, .107]			.007*	.018 [.004, .034]		
Play	.106***	.212 [.127, .298]	.057**	.070 [.026, .114]	.379***	.940 [.811, 1.071]	.006**	.015 [.005, .027]	.438***	1.085 [.989, 1.184]
Nostalgia	.444***	.887 [.808, .965]	.013	.016 [-.041, .075]			.006	.014 [-.036, .067]		
PA	.079***	.157 [.069, .245]	.098***	.121 [.073, .169]			.008**	.019 [.007, .033]		
Longing	.181***	.362 [.275, .448]	.037	.046 [-.003, .097]			.007	.017 [-.001, .036]		
Place	.108***	.216 [.130, .304]	.015	.019 [-.032, .069]			.002	.004 [-.007, .016]		

Note. β = standardized coefficients, *b* [95% CI] = unstandardized coefficients with bias-corrected confidence intervals (based on 10,000 percentile method bootstrapped samples); "PA" = Positive Affect; *p < .05, **p < .01, ***p < .001

Model 2: Functions of Nostalgia

First, we found that the condition again significantly predicted all topics and all functions, of nostalgia (see Table 4)[5]. Moreover, each topic seemed to play a different role in how nostalgia leads each of the functions (see Figure 2). First, participants whose topics included *Family* reported higher levels of social connectedness, meaning in life, and self-continuity; *Family* mediated the effect of condition on each of these three functions. Participants writing about topics related to togetherness (*Together*) reported higher levels of social connectedness, meaning in life, and positive affect; *Together* also mediated the effect of condition on these functions.

Participants whose events involved the topic of *School* reported higher levels of meaning in life and self-continuity but only mediated the effect of condition on meaning in life. Participants writing about *Play* reported higher levels of social connectedness and positive affect but lower levels of optimism and significantly mediated the effect of condition on all three of these functions. Participants discussing the topic of *Nostalgia* when writing about their respective events reported lower levels of meaning in life, self-esteem, optimism, and inspiration, while they also reported higher levels of negative affect. Moreover, the *Nostalgia* topic mediated the effect of condition on the aforementioned functions, except for negative affect. Similarly, people who discussed *Longing* when describing their memories reported lower positive affect and higher negative affect, and this Longing topic mediated the effect of condition on these affective outcomes.

Conversely, when people wrote about the *Positive Affect* of their memories, they reported higher levels of social connectedness meaning in life, self-continuity, self-esteem, inspiration,

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[5] We report the residual covariance estimates of the functions of nostalgia in SuppTable 2 in the Online Supplemental Materials.

and positive affect, while reporting lower levels of negative affect. *Positive Affect* also mediated

all effects of condition on these outcomes. Finally, when discussing a *Place* or location in their

event recall, participants reported lower levels of self-esteem, optimism, inspiration, and positive

affect, while reporting higher levels of negative affect. *Place* mediated the effect of condition on

all of these outcomes, with the exception of positive affect.

Figure 2.
Significant Paths from Condition to Function Through Topic in Model 2
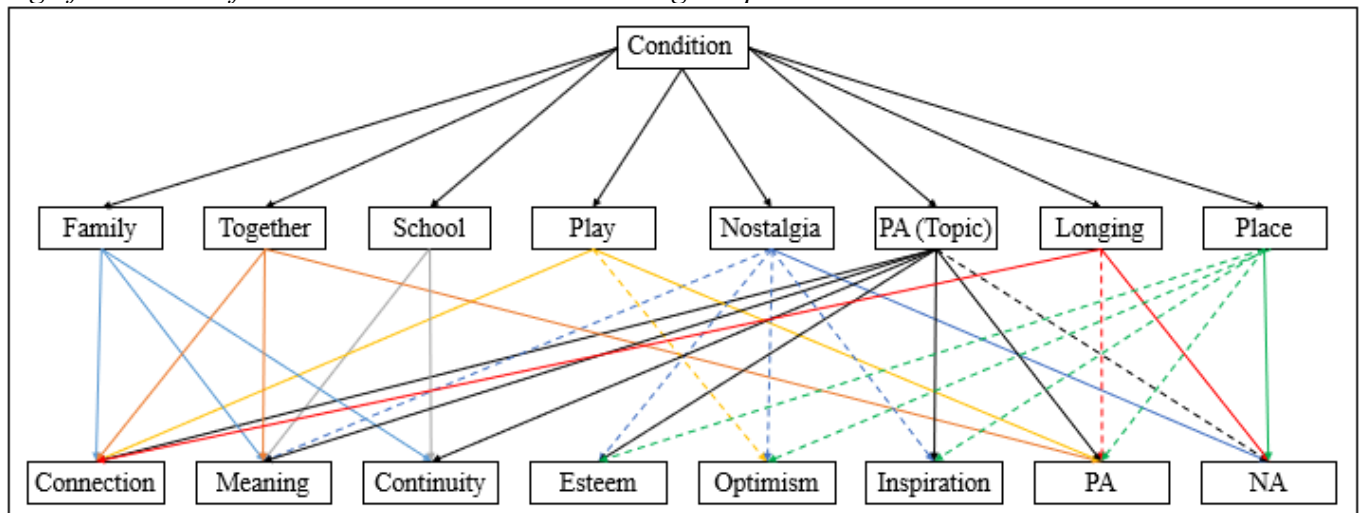
Note: "PA" = Positive Affect; Solid lines = positive association at $p < .05$; Dashed lines = negative association at $p < .05$. For clarity of presentation, we did not include lines for direct effects. All are significant (see also: Table 4).

Table 4

Estimates of Direct, Indirect, and Total Effects for Model 2

Topic	FoN	a Path (Condition to Topic) β	a Path b [95% CI]	b Path (Topic to Function) β	b Path b [95% CI]	c Path (Condition to Function) β	c Path b [95% CI]	ab Path (Indirect Effect) β	ab Path b [95% CI]	Total Effect β	Total Effect b [95% CI]
Family		.299***	.598 [.513, .682]	.137***	.223 [.157, .291]			.041***	.133 [.093, .176]		
Together		.140***	.280 [.194, .368]	.095***	.154 [.089, .218]			.013***	.043 [.023, .065]		
School		.151***	.301 [.213, .389]	.003	.004 [-.060, .070]			.000	.001 [-.019, .021]		
Play	Social	.106***	.212 [.126, .299]	.044*	.072 [.009, .133]	.246***	.801	.005*	.015 [.002, .030]	.325***	1.057
Nostalgia	Connect.	.444***	.887 [.809, .966]	.006	.010 [-.062, .081]		[.629, .970]	.003	.009 [-.055, .072]		[.919,1.190]
PA		.079***	.158 [.072, .244]	.120***	.195 [.128, .264]			.009**	.031 [.013, .052]		
Longing		.181***	.361 [.273, .447]	.041*	.067 [.002, .135]			.007	.024 [.001, .051]		
Place		.108***	.216 [.128, .302]	-.004	-.007 [-.075, .065]			.000	-.002 [-.017, .014]		
Family		.299***	.598 [.513, .682]	.062**	.090 [.032, .149]			.018**	.054 [.019, .090]		
Together		.140***	.280 [.194, .368]	.063**	.093 [.034, .150]			.009**	.026 [.009, .045]		
School		.151***	.301 [.213, .389]	.044*	.064 [.004, .123]			.007*	.019 [.001, .039]		
Play	Meaning	.106***	.212 [.126, .299]	-.016	-.023 [-.085, .039]	.225***	.658	-.002	-.005 [-.019, .008]	.248***	.722
Nostalgia	in Life	.444***	.887 [.809, .966]	-.050*	-.074 [-.145, -.074]		[.499, .817]	-.022*	-.065 [-.129, -.004]		[.598, .846]
PA		.079***	.158 [.072, .244]	.119***	.174 [.117, .230]			.009**	.027 [.011, .046]		
Longing		.181***	.361 [.273, .447]	.024	.035 [-.031, .099]			.004	.013 [-.011, .037]		
Place		.108***	.216 [.128, .302]	-.013	-.019 [-.084, .046]			-.001	-.004 [-.020, .010]		
Family		.299***	.598 [.513, .682]	.052*	.064 [.015, .115]			.016*	.039 [.009, .068]		
Together		.140***	.280 [.194, .368]	.029	.036 [-.013, .086]			.004	.010 [-.004, .025]		
School		.151***	.301 [.213, .389]	.041*	.051 [.001, .101]			.006	.015 [.000, .031]		
Play	Self-	.106***	.212 [.126, .299]	.036	.045 [-.007, .097]	.270***	.671	.004	.010 [-.002, .022]	.318***	.790
Nostalgia	Continuity	.444***	.887 [.809, .966]	.018	.022 [-.034, .078]		[.538, .802]	.008	.019 [-.030, .070]		[.687, .889]
PA		.079***	.158 [.072, .244]	.100***	.125 [.077, .174]			.008**	.020 [.008, .034]		
Longing		.181***	.361 [.273, .447]	.023	.028 [-.025, .080]			.004	.010 [-.009, .030]		
Place		.108***	.216 [.128, .302]	-.015	-.019 [-.069, .031]			-.002	-.004 [-.016, .007]		
Family		.299***	.598 [.513, .682]	-.030	-.042 [-.121, .036]			-.009	-.025 [-.073, .021]		
Together		.140***	.280 [.194, .368]	.035	.049 [-.025, .123]			.005	.014 [-.008, .035]		
School	Self-	.151***	.301 [.213, .389]	.024	.034 [-.036, .105]	.100**	.280	.004	.010 [-.011, .032]	.063*	.176
Play	Esteem	.106***	.212 [.126, .299]	.030	.043 [-.029, .112]		[.103, .462]	.003	.009 [-.006, .026]		[.039, .311]
Nostalgia		.444***	.887 [.809, .966]	-.076**	-.106 [-.184, -.027]			-.034**	-.094 [-.164, -.024]		
PA		.079***	.158 [.072, .244]	.118***	.165 [.096, .235]			.009**	.026 [.010, .045]		

Longing		.181***	.361 [.273, .447]	-.039	-.054 [-.134, .024]			-.007	-.020 [-.049, .009]		
Place		.108***	.216 [.128, .302]	-.079**	-.110 [-.183, -.034]			-.008*	-.024 [-.045, -.007]		
Family		.299***	.598 [.513, .682]	-.052	-.074 [-.152, .005]			-.016	-.044 [-.093, .003]		
Together		.140***	.280 [.194, .368]	.000	.000 [-.076, .076]			.000	.000 [-.022, .021]		
School		.151***	.301 [.213, .389]	.024	.034 [-.036, .102]			.004	.010 [-.011, .031]		
Play	Optimism	.106***	.212 [.126, .299]	-.066*	-.093 [-.171, -.093]	.104**	.294 [.106, .481]	-.007*	-.020 [-.041, -.003]	.052*	.148 [.005, .286]
Nostalgia		.444***	.887 [.809, .966]	-.065*	-.093 [-.172, -.014]			-.029*	-.082 [-.153, -.012]		
PA		.079***	.158 [.072, .244]	.047	.067 [-.005, .139]			.004	.011 [-.001, .026]		
Longing		.181***	.361 [.273, .447]	.009	.013 [-.064, .092]			.002	.005 [-.023, .034]		
Place		.108***	.216 [.128, .302]	-.085**	-.120 [-.195, -.041]			-.009*	-.026 [-.048, -.008]		
Family		.299***	.598 [.513, .682]	-.033	-.051 [-.133, .032]			-.010	-.030 [-.081, .019]		
Together		.140***	.280 [.194, .368]	-.016	-.024 [-.107, .059]			-.002	-.007 [-.032, .016]		
School		.151***	.301 [.213, .389]	.003	.005 [-.070, .078]			.000	.001 [-.022, .024]		
Play	Inspiration	.106***	.212 [.126, .299]	-.043	-.065 [-.146, .014]	.170***	.518 [.317, .719]	-.005	-.014 [-.034, .003]	.121***	.368 [.213, .520]
Nostalgia		.444***	.887 [.809, .966]	-.067*	-.102 [-.190, -.013]			-.030*	-.090 [-.170, -.012]		
PA		.079***	.158 [.072, .244]	.083*	.126 [.049, .204]			.007*	.020 [.006, .038]		
Longing		.181***	.361 [.273, .447]	.012	.019 [-.063, .102]			.002	.007 [-.023, .038]		
Place		.108***	.216 [.128, .302]	-.111***	-.169 [-.256, -.084]			-.012**	-.037 [-.063, -.015]		
Family		.299***	.598 [.513, .682]	.021	.035 [-.059, .127]			.006	.021 [-.034, .076]		
Together		.140***	.280 [.194, .368]	.104***	.174 [.082, .265]			.015**	.049 [.021, .079]		
School		.151***	.301 [.213, .389]	.023	.039 [-.044, .119]			.004	.012 [-.013, .037]		
Play	PA	.106***	.212 [.126, .299]	.084***	.142 [.066, .217]	.082*	.276 [.052, .495]	.009**	.030 [.012, .052]	.097***	.326 [.159, .489]
Nostalgia		.444***	.887 [.809, .966]	-.033	-.055 [-.149, .037]			-.015	-.049 [-.133, .033]		
PA		.079***	.158 [.072, .244]	.237***	.398 [.316, .481]			.019**	.063 [.028, .099]		
Longing		.181***	.361 [.273, .447]	-.089**	-.149 [-.237, -.059]			-.016**	-.054 [-.091, -.020]		
Place		.108***	.216 [.128, .302]	-.059*	-.099 [-.187, -.007]			-.006	-.021 [-.045, -.001]		
Family		.299***	.598 [.513, .682]	.040	.070 [-.044, .179]			.012	.042 [-.026, .109]		
Together		.140***	.280 [.194, .368]	-.028	-.050 [-.158, .058]			-.004	-.014 [-.046, .016]		
School		.151***	.301 [.213, .389]	-.009	-.016 [-.109, .078]			-.001	-.005 [-.033, .024]		
Play	NA	.106***	.212 [.126, .299]	-.032	-.055 [-.050, .040]	.096*	.334 [.082, .599]	-.003	-.012 [-.034, .009]	.150***	.521 [.343, .707]
Nostalgia		.444***	.887 [.809, .966]	.061*	.106 [-.002, .210]			.027	.094 [-.002, .188]		
PA		.079***	.158 [.072, .244]	-.178***	-.310 [-.412, -.211]			-.014**	-.049 [-.082, -.020]		
Longing		.181***	.361 [.273, .447]	.161***	.281 [.172, .386]			.029***	.102 [.056, .151]		
Place		.108***	.216 [.128, .302]	.077**	.134 [.030, .232]			.008*	.029 [.006, .056]		

Note. β = standardized coefficients, *b* [95% CI] = unstandardized coefficients with bias-corrected confidence intervals (based on 10,000 percentile method bootstrapped samples); "FoN" = Function of Nostalgia; "Social Connect." = Social Connectedness; "PA" = Positive Affect; "NA" = Negative Affect; [*]*p* < .05, [**]*p* < .01, [***]*p* < .001

Discussion

The ERT is the most common, gold standard manipulation for nostalgia and forms the basis of the nostalgia literature. Drawing insights from studies employing this methodology, we have uncovered a tapestry of themes that interlace with the fabric of nostalgia, revealing distinct patterns that intertwine with its outcomes. These findings will contribute to an enhanced focus on the psychological processes of nostalgia, its benefits, and the methods employed to study them. Below, we highlight what we consider some of the most insightful or perplexing findings.

Central to our investigation was the identification of themes that evoke nostalgic feelings. Memories linked to family, school, play, and positive emotions are primary contributors to nostalgia. Interestingly, writing about the concept of nostalgia itself does not elicit the expected emotional response. This suggests that focusing on the notion of nostalgia might inhibit the authentic experience of nostalgia by engaging in a more analytical process instead of an emotional one (e.g., reliving or mental transportation: Evans et al., 2021; Hepper et al., 2012). This emphasizes the importance of truly engaging with nostalgic memories rather than fixating solely on the idea of nostalgia. This insight underscores the relevance of earlier studies that emphasize the experiential aspect of nostalgia (Hepper et al., 2012). Additionally, while the ERT's nostalgic prompts often trigger memories, they might not always capture the full emotional spectrum of nostalgia. This points to a need for novel research methodologies, such as using sensory triggers like music (Barrett et al., 2010; Sedikides et al., 2022), scents (Green et al., 2023; Reid et al., 2015), and food (Reid et al., 2023), to evoke a more authentic nostalgic response.

Among the emerging patterns, the theme of social connections stands out prominently. Reminiscing about family, shared experiences, play, and positive emotions contributes

significantly to feelings of social connectedness. However, the theme of "longing" also plays a unique role. Longing introduces a bittersweet quality to nostalgia, adding complexity to the emotional mix. This theme seems to evoke both the absence and the significance of important relationships, suggesting that longing serves as a poignant reminder of what matters most. This dual nature of longing merits further research into its nuanced effects.

Likewise, the role of the "place" theme, which carries both positive and negative elements within nostalgia, highlights an additional "bittersweet" path of nostalgia. Similarly, Wildschut et al. (2006) found that places were a common category in their content analysis and suggested that it contributed to nostalgia's positive psychological outcomes. On the other hand, earlier conceptions of nostalgia attributed nostalgia to homesickness, while later conceptions moved away from that attribution (Batcho, 2013). This finding rekindles discussions about the connection between nostalgia and homesickness, emphasizing the multifaceted nature of place-related memories (Knez, 2006, 2014; Ratcliffe & Korpela, 2018). This insight encourages researchers to delve deeper into the emotional layers embedded within memories of specific locations and the psychology of space.

While the nostalgia topic did not predict feelings of nostalgia, it was associated with numerous psychological outcomes of nostalgia. However, what is intriguing is that it did so in a negative fashion. As the history of nostalgia notes, many people ascribe nostalgia to negative outcomes (Sedikides et al., 2015). Furthermore, not only is trait nostalgia associated with negative emotionality (e.g., Seehusen et al., 2013), but daily experiences of nostalgia co-occur with lower well-being (Newman et al., 2019). The current findings suggest that not only does a meta-cognitive focus on the topic of nostalgia not contribute to feelings of nostalgia, but that it actually might prime negative feelings. This should be important for methodological

investigations pertaining to the manipulations (e.g., Kelley et al., 2022; Wildschut & Sedikides, 2023) and measurement (e.g., Wildschut & Sedikides, 2022; Wildschut et al., 2023) of nostalgia. Particularly, many of the manipulations (e.g., ERT: Sedikides et al., 2015) and measures (e.g., Southampton Nostalgia Scale: Sedikides et al., 2015) include the term "nostalgia." The inclusion of this term might bias responses. Rather, it may be more beneficial to simply instruct participants to recall an autobiographical memory that is meaningful or significant to their lives, which are central features of the nostalgia experience (Hepper et al., 2012). These results should also contribute to the specific links between the bittersweet emotion and its outcomes.

This study also emphasizes the role of the ERT as a tool to trigger and explore emotions. Participants responding to nostalgic prompts exhibited a focus on positive emotions, which in turn correlates with numerous psychological outcomes related to nostalgia. This suggests that reflecting on the positive emotional aspects associated with nostalgic memories is crucial in understanding the benefits of nostalgia. However, it is important to note that this positive focus is not merely a reflection of participants' current emotional state; it represents the description of past events that were characterized by happiness.[6] Furthermore, even in the current results, *negative* affect is higher in the nostalgia condition than the ordinary condition. Here, we suggest that the positive affect topic we extracted represents not people's *current* emotional state, but the description of events that were happy.

The differences found between reflecting on a distant memory versus one's current experience have theoretical and empirical grounding (see Stephan & Sedikides, 2023 for a review). Stephan et al. (2012) coded nostalgic, ordinary, and positive autobiographical

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[6] We concur with Kelley et al. (2022) and Wildschut & Sedikides (2023) that the ERT is not merely a manipulation of positive affect, which would suggest a fatal confound. Nostalgia's psychological benefits have been shown using a variety of different manipulations (e.g., music, food, and smells: Sedikides et al., 2015)

narratives, revealing a unique pattern in nostalgia narratives characterized by both abstract and concrete language. The authors theorized that this pattern arises from the simultaneous focus on the core features of the distal event and its relation to one's current experience.

It was not our goal to test the idea that positive versus negative outcomes are dependent on narrative focus. However, a surface-level exploration of the correlation between our topic loadings and the concreteness norms (see Brysbaert et al.,2014) of the words within them revealed interesting patterns (see SuppTable 3 in Online Supplementary Materials). For instance, the 'family' theme had the heaviest loading of concrete words, while the 'longing' theme showed the heaviest abstract loading. All themes from the ordinary condition tended toward the concrete side. Replicating Stephan et al. (2012), it does appear that nostalgic recall contains both abstract and concrete language. Our results do not overtly support the notion that more abstract themes confer psychological benefits while concrete themes lead to a bittersweet experience, though we acknowledge the need for more in-depth tests of this idea. Future studies, employing advanced and more targeted language models, may offer improved insights into disentangling core features from current experiences.

One final implication from this work has less to do with nostalgia and more to do with leveraging topic modeling as a powerful tool to not just measure emotions, but to understand the complex nature of emotions (Boyd & Schwartz, 2021). Much work has adopted topic modeling (e.g., Latent Dirichlet Allocation) to estimate emotional processes. Less has actually used it to "take apart" different emotional processes for building theoretical understandings like we have done here. Therefore, we offer these methods as a template for future emotion researchers to better understand the form and function of emotional experiences.

Limitations & Future Directions

We note several limitations of the current study. First, all participants were from the United States. While nostalgia appears to be a universal emotion (Sedikides et al., 2015), more work is needed to specify if and how the *topics* of nostalgia vary by culture. For some cultures or regions, nostalgic memories may be tied to more negative events (e.g., war or economic instability) than positive ones. And, as our findings suggest, reflection on positive experiences appears vital to nostalgia's benefits. Second, all studies used only one manipulation. Even though the basic ERT is the most common manipulation of nostalgia and one that makes up the foundation of nostalgia research in social and personality psychology, there are others (Sedikides et al. 2015). Furthermore, recent manipulations have grown more specific, such as romantic nostalgia (Evans et al., 2022) and nostalgia for disconnected significant others (Newman & Sachs, 2023). Future work exploring the language of nostalgia in specific contexts (e.g., politics) is warranted (though the basic ERT allows participants to recall memories related to any context). Third, and relatedly, we only used one comparison condition: ordinary recall. This is a design feature of the ERT, as other, non-autobiographical writing conditions may be asymmetrical (e.g., one is memory-based, one is not). Yet, future work may compare the language of nostalgia against other related, and unrelated, emotions. Finally, our language analysis approach does not account for context. More sophisticated language models (e.g., contextual embeddings) likely have additional utility in discovering more nuance in nostalgic recall.

This study marks a crucial initial step, aiming to pave the way for new lines of research on nostalgia. As a foundational exploration, our approach is deliberately simplified, leaving room for researchers to delve deeper. For instance, even with the current dataset, further investigations could explore dependencies (i.e., interactions) between topics and their impact on

outcomes. Additionally, an intriguing avenue would be examining individual differences in the themes focused on during ERT sessions. For example, previous research suggests that individuals low (vs. high) in attachment avoidance are more likely to derive social connection from nostalgia (Juhl et al., 2012), potentially influencing their choice of themes during nostalgic recall. Numerous factors may contribute to both the themes individuals focus on and how these themes exert their influence. We are enthusiastic about the myriad possibilities that may emerge from this foundational work.

Conclusion

The study of nostalgia has undergone a remarkable transformation, transcending its historical portrayal as a mere yearning for the past to emerge as a nuanced emotion with intricate psychological implications. Through a meticulous exploration of nostalgia's content and its connection to various psychological outcomes, this research has unveiled a vibrant spectrum of topics that evoke both positive and bittersweet feelings. The interplay between these topics and nostalgia's outcomes underscores the complexity of this emotion, revealing a tapestry of outcomes ranging from connection and positivity to longing and introspection. As we reflect on these findings, we are prompted to delve deeper into the intricacies of nostalgia, unraveling its cultural variations, mechanistic underpinnings, and its role in shaping the emotional landscape. This study not only contributes to a refined understanding of nostalgia but also highlights the need for continued exploration of its multifaceted nature, inviting researchers to uncover the layers of meaning woven into the fabric of nostalgic experiences.

REFERENCES

Abeyta, A. A., & Pillarisetty, S. (2023). Nostalgia supports a meaningful life. *Current Opinion in Psychology, 49*, 101520. https://doi.org/10.1016/j.copsyc.2022.101520

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*(3), 390–403. https://doi.org/10.1037/a0019006

Batcho, K. I. (2013). Nostalgia: The bittersweet history of a psychological concept. *History of Psychology*, *16*(3), 165–176. https://doi.org/10.1037/a0032427

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497-529. https://doi.org/10.1037/0033-2909.117.3.497

Boyd, R. L. (2017). Psychological text analysis in the digital humanities. In S. Hai-Jew (Ed.), *Data analytics in digital humanities* (pp. 161–189). Springer International Publishing. https://doi.org/10.1007/978-3-319-54499-1_7

Boyd, R. L. (2018). MEH: Meaning Extraction Helper (Version 2.3.02) [Software]. Available from https://www.ryanboyd.io/software/meh

Boyd, R. L., Ashokkumar, A., Seraj, S., & Pennebaker, J. W. (2022). *The development and psychometric properties of LIWC-22*. Austin, TX: University of Texas at Austin. https://www.liwc.app

Boyd, R. L., Pasca, P., & Lanning, K. (2020). The personality panorama: Conceptualizing personality through big behavioural data. *European Journal of Personality*, *34*(5), 599–612. https://doi.org/10.1002/per.2254

Boyd, R. L., & Pennebaker, J. W. (2017). Language-based personality: A new approach to personality in a digital world. *Current Opinion in Behavioral Sciences*, *18*, 63–68. https://doi.org/10.1016/j.cobeha.2017.07.017

Boyd, R. L., & Schwartz, H. A. (2021). Natural language analysis and the psychology of verbal behavior: The past, present, and future states of the field. *Journal of Language and Social Psychology, 40*(1), 21-41. https://doi.org/10.1177/0261927X20967028

Brysbaert, M., Warriner, A. B., & Kuperman, V. (2014). Concreteness ratings for 40 thousand generally known English word lemmas. *Behavior Research Methods, 46*, 904-911. https://doi.org/10.3758/s13428-013-0403-5

Chen, J., Layous, K., Wildschut, T., & Sedikides, C. (2023). Identifying nostalgia in text: The development and validation of the nostalgia dictionary. *Journal of Consumer Psychology.* Advance online publication. https://doi.org/10.1002/jcpy.1359

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*(11), 1484–1496. https://doi.org/10.1177/0146167213499187

Chung, C. K., & Pennebaker, J. W. (2008). Revealing dimensions of thinking in open-ended self-descriptions: An automated meaning extraction method for natural language. *Journal of Research in Personality*, *42*(1), 96–132. https://doi.org/10.1016/j.jrp.2007.04.006

Evans, N. D., Juhl, J., Hepper, E. G., Wildschut, T., Sedikides, C., & Fetterman, A. K. (2022). Romantic nostalgia as a resource for healthy relationships. *Journal of Social and Personal Relationships, 39*(7), 2181-2206. https://doi.org/10.1177/02654075221075773

Evans, N. D., Reyes, J., Wildschut, T., Sedikides, C., & Fetterman, A. K. (2021). Mental transportation mediates nostalgia's psychological benefits. *Cognition and Emotion*, *35*(1), 84–95. https://doi.org/10.1080/02699931.2020.1806788

Green, J. D., Reid, C. A., Kneuer, M. A., & Hedgebeth, M. V. (2023). The proust effect: Scents, food, and nostalgia. *Current Opinion in Psychology*, *50*, 101562. https://doi.org/10.1016/j.copsyc.2023.101562

Havlena, W. J., & Holak, S. L. (1991). "The good old days": Observations on nostalgia and its role in consumer behavior. *ACR North American Advances*.

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*(1), 102–119. https://doi.org/10.1037/a0025167

Juhl, J., & Biskas, M. (2022). Nostalgia: An impactful social emotion. *Current Opinion in Psychology*, 101545. https://doi.org/10.1016/j.copsyc.2022.101545

Juhl, J., Sand, E. C., & Routledge, C. (2012). The effects of nostalgia and avoidant attachment on relationship satisfaction and romantic motives. *Journal of Social and Personal Relationships, 29*(5), 661-670. https://doi.org/10.1177/02654075124434

Kelley, N. J., Davis, W. E., Dang, J., Liu, L., Wildschut, T., & Sedikides, C. (2022). Nostalgia confers psychological wellbeing by increasing authenticity. *Journal of Experimental Social Psychology*, *102*, 104379. https://doi.org/10.1016/j.jesp.2022.104379

Kennedy, B., Ashokkumar, A., Boyd, R. L., & Dehghani, M. (2021). Kennedy, B., Ashokkumar, A., Boyd, R. L., & Dehghani, M. (2022). Text analysis for Psychology: Methods, principles, and practices. In M. Dehghani & R. L. Boyd (Eds.), *The handbook of language analysis in psychology (pp. 3–62).* The Guilford Press. https://doi.org/10.31234/osf.io/h2b8t

Leunissen, J., Wildschut, T., Sedikides, C., & Routledge, C. (2020). The hedonic character of

    nostalgia: An integrative data analysis. *Emotion Review, 13*(2), 139-156.

    https://doi.org/10.1177/175407392095045

Knez, I. (2006). Autobiographical memories for places. *Memory, 14*(3), 359-377.

    https://doi.org/10.1080/09658210500365698

Knez, I. (2014). Place and the self: An autobiographical memory synthesis. *Philosophical*

    Psychology, 27(2), 164-192. https://doi.org/10.1080/09515089.2012.728124

Markowitz, D. M. (2021). The Meaning Extraction Method: An approach to evaluate content patterns

    from large-scale language data. *Frontiers in Communication*, *6*, 588823.

    https://doi.org/10.3389/fcomm.2021.588823

McCann, W. H. (1941). Nostalgia: A review of the literature. *Psychological Bulletin*, *38*(3), 165–182.

    https://doi.org/10.1037/h0057354

Millar, N., & Hunston, S. (2015). Adjectives, communities, and taxonomies of evaluative meaning.

    Functions of Language, 22(3), 297-331. https://doi.org/10.1075/fol.22.3.01mil

Newman, D. B., & Sachs, M. E. (2023). Variation in bittersweet nostalgic feelings and their divergent

    effects on daily well-being. *Emotion, 23*(4), 937-948. https://doi.org/10.1037/emo0001137

Newman, D. B., Sachs, M. E., Stone, A. A., & Schwarz, N. (2020). Nostalgia and well-being in daily

    life: An ecological validity perspective. *Journal of Personality and Social Psychology*, *118*(2),

    325–347. https://doi.org/10.1037/pspp0000236

Pearsal, J. (Ed.). (1998). *The New Oxford Dictionary of English*. Oxford, UK: Oxford University

    Press.

Ratcliffe, E., & Korpela, K. M. (2018). Time- and self-related memories predict restorative

perceptions of favorite places via place identity. *Environment and Behavior*, *50*(6), 690-720.

https://doi.org/10.1177/0013916517712002

Reid, C. A., Green, J. D., Buchmaier, S., McSween, D. K., Wildschut, T., & Sedikides, C. (2023).

Food-evoked nostalgia. *Cognition and Emotion*, *37*(1), 34–48.

https://doi.org/10.1080/02699931.2022.2142525

Reid, C. A., Green, J. D., Wildschut, T., & Sedikides, C. (2015). Scent-evoked nostalgia. *Memory*,

23(2), 157–166. https://doi.org/10.1080/09658211.2013.876048

Revelle, W. (2023).*psych: Procedures for personality and psychological research*. Northwestern

University, Evanston, https://CRAN.r-project.org/package=psych.Rpackageversion2.3.6

Rosseel, Y. (2012). lavaan: An *R* package for structural equation modeling. *Journal of Statistical

Software*, *48*(2). https://doi.org/10.18637/jss.v048.i02

Routledge, C., Arndt, J., Wildschut, T., Sedikides, C., Hart, C. M., Juhl, J., Vingerhoets, A. J. J. M., &

Schlotz, W. (2011). The past makes the present meaningful: Nostalgia as an existential resource.

Journal of Personality and Social Psychology, *101*(3), 638–652.

https://doi.org/10.1037/a0024292

Sedikides, C., Leunissen, J., & Wildschut, T. (2022). The psychological benefits of music-evoked

nostalgia. *Psychology of Music*, *50*(6), 2044–2062. https://doi.org/10.1177/03057356211064641

Sedikides, C., & Wildschut, T. (2016). Nostalgia: A bittersweet emotion that confers psychological

health benefits. In A. M. Wood & J. Johnson (Eds.), *Wiley handbook of positive clinical

psychology* (pp. 25-36). Wiley.

Sedikides, C., & Wildschut, T. (2018). Finding meaning in nostalgia. *Review of General Psychology*,

22(1), 48–61. https://doi.org/10.1037/gpr0000109

Sedikides, C., & Wildschut, T. (2019). The sociality of personal and collective nostalgia. *European Review of Social Psychology*, *30*(1), 123–173. https://doi.org/10.1080/10463283.2019.1630098

Sedikides, C., & Wildschut, T. (2020). The motivational potency of nostalgia: The future is called yesterday. In *Advances in Motivation Science* (Vol. 7, pp. 75–111). Elsevier. https://doi.org/10.1016/bs.adms.2019.05.001

Sedikides, C., Wildschut, T., Cheung, W.-Y., Routledge, C., Hepper, E. G., Arndt, J., Vail, K., Zhou, X., Brackstone, K., & Vingerhoets, A. J. J. M. (2016). Nostalgia fosters self-continuity: Uncovering the mechanism (social connectedness) and consequence (eudaimonic well-being). *Emotion*, *16*(4), 524–539. https://doi.org/10.1037/emo0000136

Sedikides, C., Wildschut, T., Routledge, C., Arndt, J., Hepper, E. G., & Zhou, X. (2015). To nostalgize. In *Advances in Experimental Social Psychology* (Vol. 51, pp. 189–273). Elsevier. https://doi.org/10.1016/bs.aesp.2014.10.001

Seehusen, J., Cordaro, F., Wildschut, T., Sedikides, C., Routledge, C., Blackhart, G. C., Epstude, K., & Vingerhoets, A. J. J. M. (2013). Individual differences in nostalgia proneness: The integrating role of the need to belong. *Personality and Individual Differences*, *55*(8), 904–908. https://doi.org/10.1016/j.paid.2013.07.020

Stephan, E., & Sedikides, C. (2023). Mental time travel as self-affirmation. *Personality and Social Psychology Review*. https://doi.org/10.1177/10888683231203143

Stephan, E., Sedikides, C., & Wildschut, T. (2012). Mental travel into the past: Differentiating recollections of nostalgic, ordinary, and positive events. *European Journal of Social Psychology, 42*(3), 290-298. https://doi.org/10.1002/ejsp.1865

Stephan, E., Sedikides, C., Wildschut, T., Cheung, W.-Y., Routledge, C., & Arndt, J. (2015). Nostalgia-evoked inspiration: Mediating mechanisms and motivational implications. *Personality and Social Psychology Bulletin*, *41*(10), 1395–1410. https://doi.org/10.1177/0146167215596985

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*(1), 24–54. https://doi.org/10.1177/0261927X09351676

Vess, M., Arndt, J., Routledge, C., Sedikides, C., & Wildschut, T. (2012). Nostalgia as a resource for the self. *Self and Identity*, *11*(3), 273–284. https://doi.org/10.1080/15298868.2010.521452

Wildschut, T., & Sedikides, C. (2020). The measurement of nostalgia. In Ruch, W., Bakker, A. B., Tay, L., & Gander, F. (Eds.), *Handbook of positive psychology assessment.* Hogrefe.

Wildschut & Sedikides (2023). Experimental nostalgia inductions: A primer. *Manuscript under review.*

Wildschut, T., Sedikides, C., Arndt, J., & Routledge, C. (2006). Nostalgia: Content, triggers, functions. *Journal of Personality and Social Psychology*, *91*(5), 975–993. https://doi.org/10.1037/0022-3514.91.5.975

Wildschut, T., Sedikides, C., & Kelley, N. J. (2023). Trait nostalgia: Four scales and a recommendation. *Current Opinion in Psychology*, *52*, 101608. https://doi.org/10.1016/j.copsyc.2023.101608

Wildschut, T., Sedikides, C., Routledge, C., Arndt, J., & Cordaro, F. (2010). Nostalgia as a repository of social connectedness: The role of attachment-related avoidance. *Journal of Personality and Social Psychology*, *98*(4), 573–586. https://doi.org/10.1037/a0017597

Wohl, M. J., Stefaniak, A., & Smeekes, A. (2023). Collective nostalgia as a balm for the distressed

social identity. *Current Opinion in Psychology, 49*, 101542.

https://doi.org/10.1016/j.copsyc.2022.101542

Yang, Z., Izuma, K., & Cai, H. (2023). Nostalgia in the brain. *Current Opinion in Psychology*, *49*,

101523. https://doi.org/10.1016/j.copsyc.2022.101523

Yang, Z., Wildschut, T., Izuma, K., Gu, R., Luo, Y. L. L., Cai, H., & Sedikides, C. (2022). Patterns of

brain activity associated with nostalgia: A social-cognitive neuroscience perspective. *Social

Cognitive and Affective Neuroscience*, *17*(12), 1131–1144. https://doi.org/10.1093/scan/nsac036