Pancultural Nostalgia in Action:

Prevalence, Triggers, and Psychological Functions of Nostalgia Across Cultures

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Abstract

Nostalgia is a social, self-relevant, and bittersweet (although mostly positive) emotion that arises when reflecting on fond past memories and serves key psychological functions. The majority of evidence concerning the prevalence, triggers, and functions of nostalgia has been amassed in samples from a handful of largely Western cultures. If nostalgia is a fundamental psychological resource, it should perform similar functions across cultures, although its operational dynamics may be shaped by culture. This study ($N = 2606$) examined dispositional nostalgia, self-reported triggers of nostalgia, and functions of experimentally-induced nostalgia in young adults across 28 countries and a special administrative region of China (i.e., Hong Kong). Results indicated that nostalgia is frequently experienced across cultures, albeit better valued in more-developed countries (i.e., higher national wealth and life-expectancy). Nostalgia is triggered by psychological threats (especially in warmer countries), sensory stimuli (especially in more-developed countries), and social gatherings (especially in less-developed countries). The positive or negative affect prompted by experimentally-induced nostalgia varied by country, but was mild overall. More importantly, recalling a nostalgic (vs. ordinary) memory increased social connectedness, self-continuity, and meaning in life across cultures. In less-developed countries, recalling an ordinary memory also conferred some of these functions, reducing the effect size of nostalgia. Finally, recalling a nostalgic (vs. ordinary) memory augmented state satisfaction with life in countries with lower quality of living (i.e., lower life-expectancy and life-satisfaction). Overall, findings confirm the relevance of nostalgia across a wide range of cultures and indicate cultural nuances in its functioning.

Keywords: nostalgia, culture, emotion, memory, wellbeing

Public Significance Statement

This study shows that nostalgia—a bittersweet emotion prompted by fond memories from one's personal past—is a common experience across a wide range of cultures. Experiencing nostalgia has short-term psychological benefits across many cultures, which may be more or less pronounced depending on a country's level of development and quality of living.

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The self-relevant and social emotion of nostalgia is enjoying a come-back after centuries of disreputability and neglect. A burgeoning literature attests to the prevalence of nostalgia in everyday (or at least weekly) life and its psychological functions in buffering threats and boosting wellbeing (Sedikides et al., 2015b; Wildschut & Sedikides, 2023a,b). Thus far, most of this literature has focused on relatively individualistic, developed, and Western cultures. Although evidence indicates that people across a range of countries conceptualize nostalgia similarly (Hepper et al., 2014), questions regarding cross-cultural variation in the emotion's prevalence and functioning remain largely unanswered. The purpose of this article is to establish whether the prevalence, triggers, and psychological functions of nostalgia generalize across 29 cultural regions spanning five continents, and to examine the nature and source of cross-cultural variability, if any. In so doing, we aim to clarify nostalgia's place in the broader cultural context.

Nostalgia

The construct of nostalgia has had a difficult upbringing, but has matured and found its feet in the last two decades. In its first appearance in formal literature around 800 B.C., Homer's (trans. 1921) Odysseus drew on memories of his home and family to galvanize and motivate him during his long and arduous journey. The term itself was coined much later to identify a very different condition when Hofer (1688/1934) combined the Greek words nostos ("home-coming") and algos ("pain") to describe the adverse symptoms of Swiss mercenaries fighting far from home. In the ensuing centuries, nostalgia continued to have a negative reputation, labeled as a medical disease, neurological malfunction, or psychiatric disorder (Batcho, 2013; Dodman, 2018; Sedikides et al., 2004). Only from the late 20th century was nostalgia understood as separate from homesickness and depression (Davis, 1979; Kaplan, 1987), and it was redefined as "sentimental longing or wistful affection for the past" (The New Oxford Dictionary of English, 1998, p. 1266). Scholars now consider nostalgia to be a complex, social, and self-relevant emotion that is bittersweet (albeit mostly positive) in valence (Batcho, 2013; Leunissen, 2023; Sedikides & Wildschut, 2023; Srivastava et al.,

2022; Van Tilburg, 2022).

Laypersons' conceptualizations and narratives dovetail with these recent definitions, indicating that the emotion of nostalgia typically entails reflecting on a fond, somewhat rose-colored, and personally meaningful memory from one's past, usually focused on childhood or close relationships (Hepper et al., 2012; Wildschut et al., 2006). Importantly, this broad conceptualization is shared across cultures: Hepper et al. (2014) found that the most prototypical features of nostalgia generalized across young adult samples in 18 countries and five continents. The presence of cognitive features in the nostalgia prototype, such as the emotion's object, causes, and consequences, marks nostalgia as a complex (not basic) emotion (Oatley & Johnson-Laird, 2011). Hereafter, we use "nostalgic" to refer to the appraisal of a memory, item, style of remembering, or specific recall episode as evoking nostalgia. A further sign that nostalgia is a normal emotion (and not a pathology) is its prevalence in everyday life. For example, 79% of UK undergraduates, and no less than 50% of UK adults in all age categories between 18-90, report experiencing nostalgia at least once per week (Hepper et al., 2021; Wildschut et al., 2006). Proneness to nostalgia also varies on a trait level in the population (Cheung et al., 2017; Fetterman et al., 2021; Juhl et al., 2020).

Evidence indicates that the affective signature of nostalgia is bittersweet, with the "sweet" typically outweighing the "bitter." Laypersons view happiness, longing, and loss as the most prototypical features of nostalgia, with peripheral features including comfort, warmth, calmness, regret, and sadness (Hepper et al., 2012). Again, this profile largely replicates across cultures (Hepper et al., 2014). Laypersons also consider nostalgia most similar to positive and approach-oriented emotions, such as gratitude and self-compassion (Van Tilburg et al., 2019). Content analyses of nostalgia narratives among Western participants reveal a similar mix of positive (e.g., content, joy, tenderness, serenity) and negative (e.g., sadness, loss) affect (Havlena & Holak, 1991; Madoglou et al., 2017; Wildschut et al., 2006), most often in a redemptive (i.e., negative overcome by positive) trajectory (Wildschut et al., 2006). Moreover, in an experience sampling study involving twice-daily assessments, 72% of nostalgic (American) participants recounted increases in positive affect and 51% increases in negative affect, with older participants reporting larger

affective discrepancy than younger ones (Turner & Stanley, 2021). Finally, a large number of studies, primarily conducted in the USA and UK, have induced nostalgia using the Event Reflection Task (Sedikides et al., 2015b; Wildschut & Sedikides, in press; Wildschut et al., 2006), which instructs participants to recall and think or write about a personally nostalgic event (compared to a control memory, such as an ordinary, positive, or lucky event), or using nostalgic (vs. control) music (Cheung et al., 2013; Routledge et al., 2011; Sedikides et al., 2022). Compared to control conditions, nostalgia generally increases positive affect but does not influence negative affect (Sedikides et al., 2015b). This finding was reinforced by an Integrative Data Analysis on data from 41 published experiments (Leunissen et al., 2021), where nostalgia also increased ambivalent affect (the minimal value of positive and negative affect; Larsen et al., 2017). In all, nostalgia is far from a simple emotion. Instead, it has a complex hedonic profile and, more importantly, is regarded as a psychological resource that serves to re-establish psychological homeostasis. We turn to this issue next.

Nostalgia as a Psychological Resource

Nostalgic memories act as a resource, or reservoir, into which people can dip to boost or restore psychological wellbeing (Hepper & Dennis, 2023; Layous & Kurtz, 2023; Sedikides & Wildschut, 2020; Wildschut & Sedikides, 2023b). By reminding people of the cherished relationships, successes, or good times that they experienced in the past, nostalgia helps to provide and rebuild a sense that they have supportive social connections, the future is bright, and life is meaningful. Hence, nostalgia can confer short-term boosts to wellbeing. Moreover, nostalgia serves a homeostatic function. That is, psychological threat triggers nostalgia, which in turn restores wellbeing (Van Dijke et al., 2015; Wildschut & Sedikides, 2020, 2023a; Wildschut et al., 2011). In this view, the link that Hofer (1688/1934) and others made between nostalgia and adverse symptoms reflected, not *effects* of nostalgia, but the opposite causal direction: that nostalgia was being recruited to thwart and buffer those symptoms. More formally, scholars have identified three primary (and interlinked) functions of nostalgia. These are social, self-related, and existential meaning (Sedikides & Wildschut, 2018, 2019; Sedikides et al., 2015b). The same homeostatic principle underlies each of these.

Social Connectedness

Nostalgia is a social emotion. People and close relationships are at the heart of nostalgic memories (Abeyta et al., 2015b; Madoglou et al., 2017). Hence, when engaging in nostalgic reverie, the mind is "peopled" (Hertz, 1990, p. 195). Important persons from one's life feel closer, restoring a sense of security and social competence, and motivating one to approach others, form social bonds, and even help strangers (Juhl & Biskas, 2023). Specifically, inducing nostalgia (vs. control) increases perceived connectedness to others (Hepper et al., 2012; Wildschut et al., 2006), attachment security (Wildschut et al., 2006, 2010), trust and contact intentions toward a stigmatized outgroup (Turner & Stathi, 2023), interpersonal competence and social goals (Abeyta et al., 2015a; Wildschut et al., 2006), perceptions of romantic relationship quality (Evans et al., 2022), the courage to seek help from strangers (Juhl et al., 2021), as well as empathy for victims, charitable intentions, and actual donations (Green et al., 2021; Zhou et al., 2012b). Such effects are also triggered by, and strengthened under, threat. For example, loneliness was the most cited trigger of nostalgia among undergraduates (Wildschut et al., 2006, Study 2), and experimentally-induced loneliness led to higher nostalgia (Study 4). Further, nostalgia buffers (suppresses) the association between loneliness and perceived lack of social support or unhappiness in both cross-sectional and experimental contexts (Abeyta et al., 2020; Zhou et al., 2008, 2022).

Self-Related Functions

Nostalgic memories invariably include the self as protagonist, and typically the self-representation in such memories is positive (Wildschut et al., 2006). Accordingly, nostalgia is a rich source of validation for the self and helps to weave a narrative of one's identity between the past and present. Research shows that nostalgia (vs. control) increases explicit and implicit self-esteem (Hepper et al., 2012; Wildschut et al., 2006; Vess et al., 2012) and past-present self-continuity (i.e., a sense of connection between one's past and present selves; Sedikides et al., 2016; Van Tilburg et al., 2019a). Moreover, this validation extends to the future: nostalgia (vs. control) augments optimism (Cheung et al., 2013), openness (Hotchin & West, 2021), inspiration (Evans et al., 2021; Stephan et al., 2015), motivation to pursue personally-relevant goals (Sedikides et al., 2018; Van Dijke et al., 2019), and global self-continuity (i.e., a sense of connection among one's past, present, and future selves; Hong et

al., 2021, 2022). Again, this pattern buffers against threat. For example, nostalgia reduces defensiveness to negative performance feedback (Vess et al., 2012). Moreover, manipulated self-discontinuity (e.g., rapidly changing lifestyle) triggers nostalgia, and nostalgia buffers its impact on self-continuity (Sedikides et al., 2015a).

Existential Meaning

Nostalgic reflection reminds people of momentous times and important others in their lives, and so solidifies the perception that life is meaningful. Experiments show that nostalgia (vs. control) increases the sense of meaning in life (Hepper et al., 2012; Routledge et al., 2011; Van Tilburg et al., 2013) and reduces the need to search for meaning (Routledge et al., 2012). Once more, nostalgia is triggered by threats to meaning, including experimentally-induced meaninglessness (Routledge et al., 2011), boredom (Van Tilburg et al., 2013), and disillusionment (Maher et al., 2021). Subsequently, nostalgia buffers against meaning threat: After a mortality salience induction, participants who were naturally high (vs. low) in nostalgia reported greater meaning and showed lower death-thought accessibility (Routledge et al., 2008) as well as lower death anxiety (Juhl et al., 2010). As Davis (1979, p. 41) put it, nostalgia "quiet[s] our fears of the abyss."

Summary and Extensions

Overall, experimental evidence indicates that people naturally recruit nostalgia in the face of psychological threats, and that nostalgia in turn restores the aspects of wellbeing that were threatened. In a meta-analysis of 47 experiments that induced nostalgia, Ismail et al. (2020) obtained reliable effects across the key dependent measures, including a large effect on self-continuity ($d = 0.81$) and medium effects on social connectedness ($d = 0.72$), meaning ($d = 0.77$), self-esteem ($d = 0.50$), and optimism ($d = 0.38$). The homeostatic pattern has also been broadened to the physiological domain. For example, nostalgia was higher on days that had colder temperature (Zhou et al., 2012a, Study 1) and when in a colder than warmer room (Study 2). Further, induced nostalgia increased perceived warmth, room temperature estimates, and tolerance in a cold pressor test (Studies 3-5). Moreover, nostalgia was evoked by adverse weather (naturally-occurring or induced via audio-recording) and buffered the ensuing distress (Van Tilburg et al., 2018). Finally, induced nostalgia promoted health

optimism and consequent engagement in physical activity (Kersten & Cox, 2023).

Why Might the Operation of Nostalgia Generalize Cross-Culturally?

The above-reviewed literature points to nostalgia as serving crucial regulatory functions. Self-conscious emotions are theorized to have evolved to regulate socially relevant behavior in complex social hierarchies (Gilbert, 2000; Goetz & Keltner, 2007; Tracy & Beall, 2020; Tracy et al., 2020). Although the link between biological and cultural evolution is tenuous, findings indicate that emotions such as shame, guilt, embarrassment, pride, and jealousy are conceptualized similarly across cultures (Cowen & Keltner, 2017; Edelstein & Shaver, 2007; Fontaine et al., 2007) and are communicated via largely culturally-shared facial expressions (Cordaro et al., 2020; Ekman, 1993; Haidt & Keltner, 1999; Tracy & Robins, 2008). Nostalgia, which also meets many self-conscious emotion criteria (Van Tilburg et al., 2019b), could fit neatly within this framework, given that it facilitates self-regulation and prosocial behavior. Similarly, emotional states that co-occur in nostalgia are present in language across many cultures, and reflect both internally-referent emotions (e.g., longing, contentment, suffering—known as ego-focused) and socially-oriented emotions (e.g., adoration, empathy—known as social control; Hupka et al., 1999). Indeed, evidence of nostalgia is apparent in cultural practices, literature, and art across the globe (for reviews see: Batcho, 2023; Hepper et al., 2014; Jacobsen, 2020). Importantly, people in 18 cultures cohered in their understanding of nostalgia (Hepper et al., 2014), indicating that the construct has a shared meaning across cultural contexts. This provides a basis for examining its operation across cultures. Still, more would be needed to establish the emotion's cross-cultural generality. If nostalgia is a naturally-occurring, adaptive emotion, then, across a range of cultures, it should (a) manifest frequently, (b) be triggered by threatening and sensory stimuli, and (c) boost wellbeing.

Thus far, most empirical research on these three criteria has focused on participants in Western cultures, but researchers have begun to study nostalgia in a range of cultures (Sedikides & Wildschut, 2022). Crucially, though, none of these studies compared nostalgia or its effects across cultures. In terms of *prevalence*, trait nostalgia has been measured reliably in China, Greece, Ireland, Japan, Russia, The Netherlands, UK, and USA (Holak &

Havlena, 1998, 2005; Kelley et al., 2022; Kusumi et al., 2010; Madoglou et al., 2017; Routledge et al., 2008; Seehusen et al., 2013; Van Tilburg et al., 2013; Zhou et al., 2008). In terms of *triggers*, participants' self-reports of triggers originated in UK samples (Wildschut et al., 2006, 2010). Nostalgia is prompted by varied experimentally induced threats or discomfort in China, Greece, Ireland, The Netherlands, UK, and USA (Abakoumkin et al., 2017; Van Tilburg et al., 2013; Zhou et al., 2008; Zhou et al., 2012a), by music or lyrics in The Netherlands, UK, and USA (Abeyta & Routledge, 2016; Barrett et al., 2010; Cheung et al., 2013; Zhou et al., 2012a), by scents and food in the USA (Reid et al., 2015; Zhou et al., 2019), and by visual stimuli such as adverts, reading materials, and social media in Australia, China, Japan, and USA (Kusumi et al., 2010; Lasaleta et al., 2014; Marchegiani & Phau, 2013; Wildschut et al., 2018; Zhou et al., 2012b). In the USA, nostalgia is also higher on days when participants have seen old friends, and during interactions with friends or family compared to when working or studying (Newman et al., 2020).

In terms of *functions*, numerous experiments have shown comparable short-term effects of nostalgia on self-reported and behavioral outcomes (e.g., social connectedness, meaning) in the same countries as above (Abakoumkin et al., 2017, 2019; Hart et al., 2011; Routledge et al., 2011; Turner et al., 2013; Van Tilburg et al., 2013; Wildschut et al., 2006; Zhou et al., 2012b), as well as Denmark (Sedikides et al., 2018) and Syrian refugees in Saudi Arabia (Wildschut et al., 2019). Nostalgia has also been induced with the aforementioned Event Reflection Task (Sedikides et al., 2015b) in Australia (Iyer & Jetten, 2011), although the dependent measures differed from those of other studies above. Finally, self-reported nostalgia after recalling a "special moment" correlated with optimism, relatedness, and vitality in Mexico (Puente-Díaz & Cavazos-Arroyo, 2021).

At first glance, then, the evidence so far appears consistent with nostalgia operating in a similar way in a range of countries. However, across all three criteria, the number of studies conducted with UK and USA participants vastly outnumbers the studies conducted in other countries, and entire continents and many cultures are missing from the evidence base. Moreover, no systematic comparisons of nostalgia across cultures have been conducted. For example, although nostalgia can be measured in numerous cultures, its relative prevalence or

functions in different cultures are unknown. The present investigation takes this next step to addressing such questions empirically.

Why Might the Operation of Nostalgia Vary Cross-Culturally?

We suggested above that, if nostalgia is psychologically adaptive, it should generalize across cultures. However, there are also good reasons to expect cross-cultural variability in the experience and operation of emotions. Even emotions that are adaptive and fundamental are shaped by the sociocultural context in the way that they are interpreted, communicated, and used for regulation (Barrett et al., 2007; Krys et al., 2016; Ma et al., 2018; Nelson & Russell, 2013). We focus on two reasons why the experience or operation of nostalgia might vary across cultures. One pertains to the cultural orientation of self-construals, the other to the varying presence of psychological threats in different countries.

Cultural Orientation

A dominant framework for understanding cross-cultural variation in self-relevant processes (including emotions) focuses on independent versus interdependent self-construals (Markus & Kitayama, 1991, 2010). This framework holds that people differ in the degree to which they account for relational ties when construing the self. Persons with independent self-construal (promoted by individualistic cultures such as most North American and Western European countries) view the self as separate from the social context, whereas persons with interdependent self-construal (promoted by collectivistic cultures such as most East-Asian and Hispanic countries) define the self primarily in terms of relationships or social groups. As such, people's well-being mainly derives from personal happiness or satisfaction in more individualistic cultures, but hinges on their relationships with others in more collectivistic cultures (Kwan et al., 1997). Most research has compared North-American to East-Asian samples. For example, internally-oriented and socially disengaging positive emotions (e.g., pride) promoted US participants' subjective well-being, whereas relationally-oriented and socially engaging positive emotions and attitudes (e.g., friendly feelings) better predicted Japanese participants' well-being (Kitayama et al., 2006; Uchida & Kitayama, 2009).

Cultural differences in self-construal contribute to normativity and desirability of

different emotions. One example is pleasure. Independent people (e.g., European North Americans) are more likely to regard positive emotions as desirable and negative emotions as undesirable, which motivates them to maximize positive affect and minimize negative affect (Eid & Diener, 2001; Miyamoto et al., 2017). In contrast, interdependent people (e.g., East-Asians) are more likely to think that positive emotions have negative attributes (An et al., 2017; Miyamoto & Ma, 2011), view negative emotions as less undesirable (Eid & Diener, 2001), and show weaker adverse effects of experiencing negative emotions (Kuppens et al., 2008). Moreover, interdependent people may have greater emotional complexity—co-occurrence of positive and negative emotions—than independent people (Grossmann & Ellsworth, 2017).

Given the well-established cultural differences in self-construal and emotion, it is plausible that the prevalence, triggers, and consequences of nostalgia might vary by a culture's dominant self-construal. For example, as a mixed emotion (Hepper et al., 2012; Leunissen et al., 2021; Sedikides & Wildschut, 2016), nostalgia might be valued more highly in collectivistic cultures. Given that norms and desirability influence the extent to which people seek, notice, and regulate particular emotions in themselves and others (Eid & Diener, 2001), this higher value might manifest in higher *prevalence* in collectivistic cultures. Nostalgia might be *triggered* more often by internal prompts (e.g., negative affect) in individualistic cultures and by social contexts (e.g., family gatherings) in collectivistic cultures. This is analogous to the finding that, among collectivistic (vs. individualistic) cultures, shame and pride pertain more often to events experienced by close others, and occur more often in public than private contexts (Fischer, 1999; Wong & Tsai, 2007).

In terms of *psychological functions*, the focus of nostalgic memories or the benefits they foster might also reflect the dominant self-construal. For example, in relatively collectivistic (vs. individualistic) cultures, nostalgia might prompt more ambivalent affect because of the relative openness to negative and mixed emotions. In accord with this notion, negative (peripheral) features of nostalgia were rated as more prototypical among East-Asian countries than other groups of countries, whereas positive (central) features did not differ systematically (Hepper et al., 2014). In the only relevant empirical examination that

compared effects of nostalgia across cultures, Leunissen et al.'s (2021) Integrative Data Analysis found that effects of nostalgia (vs. control) on positive and negative affect did not differ in the six Chinese studies compared to the 35 Western studies. No other investigations have compared cultures directly. Further, nostalgia might serve more to foster social connectedness in collectivistic cultures and self-esteem in individualistic cultures. This parallels findings that Asian participants recall more socially-oriented autobiographical memories than Westerners (Ross & Wang, 2010) and that after exposure to an equivalent emotional scenario, Filipino (collectivistic) employees focused on relationship-building, whereas Dutch (individualistic) employees focused on self-protective withdrawal from others (Bagozzi et al., 2003).

Presence of Threats

A second set of cultural influences on nostalgia pertain to its homeostatic, threat-buffering function (Wildschut & Sedikides, 2023a,b). In terms of *prevalence*, if nostalgia is something to which people turn in times of threat, then proneness to it might be higher in countries that experience more frequent threat (operationalized in terms of fewer resources/wealth, more ill-health, less happiness overall, or colder temperature). Such a finding would be consistent with evidence that nostalgia is higher among individuals who feel lonely (Zhou et al., 2008), experienced recent life changes (Sedikides et al., 2015a), or on colder or bad-weather days (Van Tilburg et al., 2018). There is no clear reason to expect country-level threats to moderate the types of *triggers* of nostalgia, except perhaps higher average ratings in countries exposed to higher (vs. lower) threat. In terms of *functions*, in countries with greater threat indices, state nostalgia (induced by recalling a nostalgic event in one's life) might also be more potent in boosting wellbeing. Experimental research shows that the effects of nostalgia are often stronger under conditions of threat (Hepper et al., 2021; Routledge et al., 2008; Van Dijke et al., 2019) and benefit people in vulnerable populations or life circumstances (Wildschut & Sedikides, 2023b). Findings relevant to these questions would have implications for understanding how people maintain wellbeing across cultures, and could inform interventions.

Overview and Hypotheses

Our multi-laboratory investigation aimed to understand the generalizability and replicability of nostalgia patterns across cultures. We collected primary data from 28 countries and a special administrative region of China (i.e., Hong Kong) across five continents.[1] We recruited participants from university student populations to maintain consistent age ranges and educational levels (Hepper et al., 2014; Van de Vijver & Leung, 1997). We also gathered data from external sources on country-level factors that might moderate the role of nostalgia as described above. For cultural orientation, we used established levels of individualism vs. collectivism. For threat, we used indicators of a country's economic, physical, and emotional wellbeing: wealth (i.e., Gross Domestic Product per capita; GDP), average life expectancy, country-level life satisfaction, and average temperature. Overall, our primary hypotheses anticipated that established effects of nostalgia would emerge across a majority of cultures. Our secondary hypotheses concerned country-level moderators of these nostalgia effects. More specifically, we had three main objectives.

First, we sought to establish the relative *prevalence of nostalgia* across cultures. Previous studies in Western cultures indicate that nostalgia is a frequent experience (more than once a week for most individuals; Hepper et al., 2021; Wildschut et al., 2006), and nostalgia features in cultural and arts practices across the world (Batcho, 2023; Hepper et al., 2014; Jacobsen, 2020). Thus, we expected the median frequency of nostalgia to be once a week or more across most cultures (Hypothesis 1a). We also assessed trait nostalgia using two of the most widely-used measures—the Southampton Nostalgia Scale (SNS; Barrett et al., 2010; Routledge et al., 2008) and the Batcho Nostalgia Inventory (BNI; Batcho, 1998)— and tested for country-level predictors of nostalgia levels. Drawing on the regulatory model of nostalgia (Wildschut & Sedikides, 2023a), we hypothesized that nostalgia would be higher in countries that have lower wealth, life expectancy, satisfaction, and colder temperatures (Hypothesis 1b).

Second, we investigated *factors that trigger nostalgia* in different cultures. We

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[1] For brevity and readability we use the term "country" hereafter to refer to the cultural region samples, while acknowledging that Hong Kong is a Special Administrative Region of China and some other samples may reflect more specific cultural regions or populations within their country.

collated triggers identified in the nostalgia literature (e.g., feeling sad, listening to music, community events), and asked participants to rate how often they feel nostalgia when in that situation. We examined how these triggers group into factors to add coherence to the literature and facilitate cross-cultural comparisons. We also gave participants the opportunity to list their own triggers in an exploratory investigation. Based on evidence relating to shame and pride (Fischer, 1999; Wong & Tsai, 2007), we hypothesized that participants in individualistic cultures would endorse more individual triggers of nostalgia (i.e., negative affect, insecurity, sensory—these experiences are proximally personal, even if they were elicited distally by social or collective events), whereas those in collectivistic cultures would endorse more communal ones (i.e., social interaction) (Hypothesis 2). We made no hypotheses about the effects of country threat indices on triggers.

Third, we examined the extent to which the documented state-level *psychological benefits of nostalgia* generalize across cultures. To this end, we conducted an experiment using the Event Reflection Task (Sedikides et al., 2015b), whereby participants were randomly allocated to write about either a personally nostalgic or a personally ordinary memory. This task is the most commonly used in the nostalgia literature (Wildschut & Sedikides, in press) and its effects are typically not explained by positivity (Leunissen et al., 2021). We collected self-reports of state nostalgia, positive and negative affect, state satisfaction with life (which arguably captures hedonic wellbeing), and a range of psychological functions identified in prior nostalgia research (i.e., social connectedness, meaning, self-esteem, self-continuity, optimism—which arguably capture aspects of eudaimonic wellbeing; Hepper & Dennis, 2023). As a manipulation check, we first expected that, across cultures, participants in the nostalgia (vs. ordinary) condition would report higher state nostalgia.

Relying on prior research, we anticipated nostalgia to generate more positive affect, but not negative affect, compared to the control condition (Hypothesis 3a). Nostalgia might also prompt greater ambivalence than control (Hypothesis 3b). However, these patterns might vary across cultures. Based on prototypicality of negative features in Hepper et al.'s (2014) findings, we expected that participants in East-Asian (vs. non East-Asian) countries or

regions would report higher negative affect or ambivalence in the nostalgia than control condition (Hypothesis 3c).

We hypothesized that, across cultures, participants in the nostalgia (vs. ordinary) condition would report higher levels of each psychological function (Hypothesis 4a). Further, we tested the novel proposition that cultural factors might moderate some of these functions. Specifically, we proposed that nostalgia (compared to control) would engender more self-related functions (i.e., self-esteem, optimism, inspiration) in cultures that are relatively more individualistic (vs. collectivistic), and would engender more communal functions (i.e., social connectedness) in cultures that are relatively more collectivistic (vs. individualistic) (Hypothesis 4b). Given that nostalgia serves as a buffer against various psychological threats, we also examined the notion that its psychological benefits would be stronger in countries that had lower wealth, life expectancy, satisfaction, or temperature (Hypothesis 4c).

Method

Participants

We tested 2606 university students (1696 women, 869 men, and 41 who did not specify their gender and so might identify as non-binary; $M_{AGE} = 22.78$ years, $SD_{AGE} = 5.89$ years) in 29 cultural regions (Table 1).[2] We aimed to recruit a minimum of 80 participants in each country or cultural region and exceeded this target in most subsamples. The target was based on consultation with international collaborators, many of whom did not have access to large participant pools or funds for offering incentives. This sample would also provide sufficient power (.89-.95; G*Power; Faul et al., 2007) to detect in each country the most well-established effects of nostalgia (vs. ordinary control) condition on social connectedness ($d = .72$), meaning ($d = .77$), and self-continuity ($d = .81$; Ismail et al., 2018). A sensitivity analysis (G*Power; Faul et al., 2017) indicated that the obtained overall sample yielded 0.80 statistical power to detect a very small effect in a 2 (Condition) × 29 (Country) ANOVA ($f = .095, f^2 = .009, \alpha = .05$). Participants were invited via classes or university research

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[2] An additional 40 participants, distributed across 12 countries, began the study but were excluded from analyses for pre-determined reasons, that is, because they completed less than 50% of the materials ($n = 30$) or indicated a different nationality from the country in which they participated ($n = 10$). Participants with less than 50% missing data were included in analyses for those variables they completed.

1 **Table 1**

2 *Participant and Main Method Characteristics*

Country	N	Gender %			Age			Language	Format	Setting
		Female	Male	Unspecified[a]	Range	M	SD			
Australia	81	70.4	28.4	1.2	16-41	18.89	3.83	English	Paper-pencil	Lab
Belgium	97	52.6	47.4	0.0	18-38	21.26	2.72	French	Paper-pencil	Lab
Brazil	85	55.3	44.7	0.0	18-66	29.46	11.82	Brazilian Portuguese	Paper-pencil	Lab
Cameroon	134	34.3	58.2	7.5	18-45	23.47	4.72	French	Paper-pencil	Lab
Chile	72	66.7	26.4	6.9	18-28	20.43	2.08	Spanish	Computer	Online
China	80	71.3	28.7	0.0	17-35	22.24	3.44	Chinese	Paper-pencil	Lab
Denmark	87	67.8	32.2	0.0	18-48	23.21	5.48	Danish	Computer	Lab
Ethiopia	85	20.0	65.9	14.1	18-34	23.02	3.89	English	Paper-pencil	Lab
Finland	103	85.4	14.6	0.0	19-59	25.07	5.83	Finnish	Computer	Online
Germany	84	42.9	54.8	2.4	16-38	22.28	3.89	German	Computer	Lab
Greece	90	61.1	37.8	1.1	18-51	21.39	5.38	Greek	Paper-pencil	Lab
Hong Kong	123	66.7	32.5	0.8	17-33	20.02	1.82	Chinese	Paper-pencil	Lab
India	93	78.5	21.5	0.0	21-36	24.05	2.75	English	Paper-pencil	Lab
Israel	80	77.5	22.5	0.0	18-32	22.44	2.56	Hebrew	Computer	Lab
Italy	99	48.5	51.5	0.0	19-31	22.85	2.27	Italian	Paper-pencil	Lab
Japan	73	46.6	53.4	0.0	19-64	20.81	5.34	Japanese	Paper-pencil	Lab
Netherlands	89	83.1	16.9	0.0	18-57	25.40	8.07	Dutch	Computer	Online
Poland	93	58.1	41.9	0.0	20-58	32.64	8.50	Polish	Computer	Online
Portugal	104	86.5	13.5	0.0	18-48	22.24	5.33	Portuguese	Computer	Online

| Country | N | Gender % | | | Age | | | Language | Format | Setting |
		Female	Male	Unspecified[a]	Range	M	SD			
Romania	79	58.2	41.8	0.0	19-48	33.76	8.21	Romanian	Paper-pencil	Lab
Russia	85	84.7	15.3	0.0	18-25	19.68	1.30	Russian	Paper-pencil	Lab
Singapore	100	73.0	27.0	0.0	18-27	20.89	1.54	English	Paper-pencil	Lab
Spain	78	83.3	15.4	1.3	20-30	21.87	1.56	Castilian Spanish	Computer	Online
Tunisia	75	81.3	18.7	0.0	18-46	21.53	4.31	French & Arabic	Paper-pencil	Lab
Turkey	82	78.0	19.5	2.4	18-49	22.06	3.69	Turkish	Computer	Online
UAE	86	69.8	27.9	2.3	17-23	19.63	1.39	English	Paper-pencil	Lab
UK	100	83.0	16.0	1.0	18-24	19.26	1.24	English	Computer	Lab
USA	92	57.6	41.3	1.1	18-49	20.44	4.05	English	Computer	Lab
Uzbekistan	77	53.2	44.2	2.6	18-25	20.50	1.78	Uzbek	Paper-pencil	Lab

3 *Note*. Age data are based on participants without missing responses. [a]Participants who did not select either female or male may include non-
4 binary participants.

5 participation systems and took part in class, in a laboratory, or via the internet between 2014-

6 2018. Some students were volunteers, some received course credit, and others received a

7 small monetary compensation. The study was reviewed and approved by the Ethics

8 Committee of the first author's institution; co-authors at recruiting institutions also obtained

9 relevant local approvals before collecting data. Participants received written instructions and

10 completed materials on paper or computer. We presented all materials in the same format and

11 in the order below regardless of the medium.[3]

12 **Materials and Procedure**

13 *Translation*

14 Each sample completed measures in their native language, or in English if their

15 studies took place in English (e.g., India, Singapore, UAE). Where relevant, materials were

16 translated and back-translated by bilingual speakers or professional translators (Brislin,

17 1980). The only exceptions were (a) Germany, where three fluent speakers each translated

18 materials and the researcher integrated these into a final version, and (b) Romania, where a

19 bilingual speaker and certified translator with a Bachelor's degree in English translated

20 materials independently. We did not encounter any problems with understanding materials.

21 *Event Reflection Task*

22 We randomly assigned participants to the nostalgia or control condition. Participants

23 in the nostalgia condition received a brief definition of nostalgia ("sentimental longing for

24 one's past, or feeling sentimental for a fond and valued memory from one's personal past")[4]

25 and were asked to "think of a nostalgic event in your life. Specifically, try to think of a past

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[3] Participants completed the experimental manipulation before the dispositional prevalence and triggers measures, to avoid priming nostalgia (especially for participants in the ordinary condition) and thereby biasing their memories or state measures. We tested if prevalence or triggers differed by condition (see Supplemental Material for details). Participants in the nostalgia (vs. ordinary) condition scored slightly higher on the BNI ($d = 0.17$) but not the SNS ($d = 0.06$), and slightly higher on social triggers ($d = 0.12$) but not threat or sensory triggers (respective ds = 0.04, 0.03). Given that participants were randomly allocated equally to conditions in each sample, these small spurious effects are independent of the primary effects and do not impact their interpretation.

[4] In most countries, a variant of the word "nostalgia" is in common usage and so this definition was sufficient. In three countries, we added information to the definition to ensure clarity to participants. Specifically, in Portugal we included the word "saudade," in Germany the word "Sehnsucht," and in Ethiopia the word "Tizita." These language-specific terms refer to a form of sentimental longing that is not specific to the past; the definition of nostalgia provided made the past target clear.

26 event that makes you feel most nostalgic." Participants in the control condition thought of an

27 "ordinary event in your life." All participants then wrote down four keywords relevant to

28 their event. On the following page, they spent a few minutes writing about the event and how

29 it made them feel. This manipulation has been extensively used and validated (Hepper et al.,

30 2012; Sedikides et al., 2015b; Wildschut et al., 2006).

31 ***State Affect***

32   Participants rated their current affect on five positive (e.g., "I feel… happy,"

33 "enthusiastic," "calm") and five negative (e.g., "I feel … "sad," "anxious," "bored")

34 adjectives (1 = *not at all*, 6 = *extremely*; $\alpha_{\text{positive affect}}$ = .76, $\alpha_{\text{negative affect}}$ = .73).[5] We also

35 calculated an ambivalence score by taking the minimum value of a participant's ratings on

36 the items "happy" and "sad" (e.g., if happy = 4 and sad = 3, then ambivalence = 3; Larsen et

37 al., 2017; Leunissen et al., 2021). Simultaneous happiness and sadness is the most

38 prototypical type of ambivalent affect (Russell, 2017). The minimum-score approach

39 provides an index of simultaneous co-activation and is the most sensitive index of

40 ambivalence (Larsen et al., 2017). Ambivalence scores were positively skewed, and so we

41 log-transformed them for analysis.

42 ***Nostalgia Functions***

43   Participants rated 24 items reflecting established state functions of nostalgia (1 =

44 *strongly disagree*, 6 = *strongly agree*). The original Nostalgia Functions Scale (Hepper et al.,

45 2012) contains four items each assessing social connectedness (e.g., "I feel… connected to

46 loved ones;" α = .86), meaning (e.g., "…life has a purpose;" α = .88), and self-esteem (e.g.,

47 "…I like myself better;" α = .89). We included more recently developed 4-item subscales

48 assessing optimism (e.g., "…optimistic about the future;" α = .87; Cheung et al., 2013),

49 inspiration (e.g., "…filled with inspiration;" α = .92; Stephan et al., 2015), and self-continuity

50 (e.g., "…connected with my past;" α = .72; Sedikides et al., 2016).

51 ***State Satisfaction with Life***

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[5] We additionally included the items "regretful" and "homesick" for an unrelated project, as well as 8 items assessing levels of self-certainty and perceived importance of money for exploratory purposes. We did not analyze the relevant data.

52   The Satisfaction with Life scale (Diener et al., 1985) contains five items (e.g., "In

53   most ways, my life is close to my ideal"). We converted this scale to state format by adding

54   the stem "Now, I feel that…" (1 = *strongly disagree*, 6 = *strongly agree*; α = .85).

State Nostalgia

56   Participants completed the 3-item State Nostalgia Scale (e.g., "Right now, I am

57   feeling quite nostalgic;" 1 = *strongly disagree*, 6 = *strongly agree*; α = .95), which has been

58   used extensively as a manipulation check for nostalgia inductions (Abeyta et al., 2015a;

59   Hepper et al., 2012; Wildschut et al., 2006). We placed it at the end of the experimental

60   materials to avoid demand characteristics or priming effects that might influence responses to

61   the dependent measures.

Dispositional Nostalgia

63   We assessed dispositional nostalgia with the two most commonly-used scales

64   (Wildschut & Sedikides, 2022b), the SNS and the BNI, preceded with the aforementioned

65   definition of nostalgia. The scales differed somewhat in their orientation, assuring a more

66   comprehensive assessment of the construct. The SNS (Barrett et al., 2010; Routledge et al.,

67   2008; Sedikides et al., 2015b) contains seven items. Six inquire about the extent to which one

68   values nostalgia (e.g., "How valuable is nostalgia for you?"; 1 = *not at all*, 7 = *very much*)

69   and experiences it frequently ("How often do you experience nostalgia?"; 1 = *very rarely*, 7 =

70   *very frequently*). The final item asks participants to indicate specifically how often they bring

71   to mind nostalgic experiences (1 = *at least once a day*, 8 = *less than once a year*).[6] We

72   recoded the final item and computed a mean nostalgia score (*M* = 4.63, *SD* = 1.26). Although

73   the SNS includes items referring to value and frequency, all seven items load onto a single

74   factor (Biskas et al., 2022; Evans et al., 2022; for more information on validation see

75   Wildschut & Sedikides, 2022b). In the present sample, the SNS was reliable overall (α = .90)

76   and in every country (αs ranged from .75-.94).

77   The BNI (Batcho, 1998) requests participants to rate how nostalgic they feel about 20

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[6] The final SNS item typically offers 7 response options ranging from "at least once a day" to "once or twice a
year" (reverse scored). To allow for the possibility that some countries might be low on nostalgia proneness, we
added an 8th option "less than once a year". We reverse-coded and rescaled this item to fit into a 1-7 scale (e.g.,
1 = 7, 2 = 6.142 … 7 = 1.857, 8 = 1) before computing the overall SNS score.

78   persons, situations, or events (e.g., "my family," "the way people were," "vacations I went

79   on;" 1 = *not at all nostalgic*, 5 = *very nostalgic*; $M = 3.13$, $SD = 0.71$). Again, the scale was

80   reliable overall ($\alpha = .87$) and in every country (αs ranged from .76-.92). The two nostalgia

81   scales correlated moderately at the individual level, $r(2600) = .54$, $p < .001$. Assessments of

82   nostalgia with the two scales have also produced moderate positive correlations in China

83   (Zhou et al., 2008), the UK (Stephan et al., 2014), and the USA (Routledge et al., 2008).

84   *Triggers of Nostalgia*

85   Participants were presented with a list of 17 events, situations, and feelings that have

86   been identified in prior research or discussed in the literature as triggers of nostalgia (e.g.,

87   "When I am feeling lonely;" "When my life is changing a lot;" "When I am talking with old

88   friends;" "At festivals or feasts"). For each one, participants rated how often they feel

89   nostalgic (if ever) when in that situation (1 = *never/almost never*, 6 = *always/almost always*).

90   To examine the factor structure of this scale while accounting for the nesting of participants

91   within countries, we group-mean centered the 17 items within country and conducted an

92   Exploratory Factor Analysis (Principal Axis Factoring with oblique rotation) on the group-

93   centered items. The analysis indicated the presence of three factors: Psychological Threat (9

94   items: sad, lonely, bored, meaningless, cold, life changes, fear of future, fear of death,

95   discontinuity; $\alpha = .85$), Social Gatherings (4 items: community events, religious rituals,

96   festivals, family gatherings; $\alpha = .77$), and Sensory Triggers (4 items: photos/keepsakes,

97   music, seeing friends, scent; $\alpha = .77$). The three triggers scales correlated moderately at the

98   individual level, rs(2589) ranging from .30-.46, ps < .001. Participants were also given space

99   to add up to three other situations that make them feel nostalgia. These additional triggers

100   were translated into English by a bilingual researcher.

101   Finally, participants reported demographic information by completing open-text

102   boxes for age and ethnic background and indicating gender as "male" or "female." Given that

103   the materials did not offer inclusive gender options, participants who identified as a different

104   gender could leave this question blank or add a note. As a mood repair exercise, they

105   identified the object in their life for which they are most grateful, before being debriefed.

106   **Country-Level Information**

107   We obtained country-level information from a range of external sources.

108   *Individualism (vs. Collectivism)*

109   We extracted this variable from Hofstede et al.'s (1990/2010) list of Individualism

110   Index (IDV) scores, which were based on questionnaires completed by 88,000 IBM

111   employees in 74 countries in the 1970s, and remain the most comprehensive published data

112   on cultural values. Scores range from 0 (*most collectivistic*) to 100 (*most individualistic*).

113   Tunisia was not included in Hofstede's list, but has been considered to score similarly to

114   other Arab countries (Basabe & Ros, 2005). Uzbekistan was also not included in the list, but

115   more recent work indicates that it is a collectivistic country (Ernazarov, 2012; Safarov, 2011).

116   *Wealth*

117   We operationalized wealth as Gross Domestic Product per capita, on a person power

118   parity basis in US dollars, obtained from the Central Intelligence Agency's World Factbook.

119   We consulted the 2015 data for samples collected in 2014/15; for samples collected in

120   subsequent years we used the respective year's database.

121   *Life Expectancy*

122   We obtained life expectancy at birth from the World Factbook

123   (https://www.cia.gov/the-world-factbook/).

124   *Life Satisfaction*

125   We obtained this variable from the Happy Planet Index (2016). It uses responses from

126   the World Gallup Poll in which participants in 119 countries rated their present life on a

127   ladder scale from 0 (*worst possible*) to 10 (*best possible*). The three indices of development

128   (i.e., wealth, life expectancy, life satisfaction) correlated positively, but not redundantly, at a

129   country level, rs(28) = .636-.711, ps < .001.

130   *Average Temperature*

131   We obtained average temperatures, in degrees Celsius, from the World Climate Index

132   (2007), which reports a 30-year average based on World Meteorological Organization data.

133   We extracted data for the major weather station closest to each site of data collection. A

134   handful of countries were unavailable from this source; as such, we obtained average

135   temperatures for them from the World Weather website, which reports data supplied by

136   National Meteorological and Hydrological Services in each country

137   (http://worldweather.wmo.int/en/).

Transparency and Openness

139   We report how we determined our sample size, all data exclusions (if any), all

140   manipulations, and all measures in the study. All data, analysis code, and materials are

141   available at https://osf.io/dr42p/?view_only=4d91cf4e8b1049349797c25e11e0060d. We

142   follow JARS (Kazak, 2018). Further, we analyzed data using SPSS. This study's design and

143   analysis were not pre-registered.

Results

Analytic Strategy

146   All variables were normally distributed unless specified below, contained < 1.6%

147   missing data, and had fewer than two outliers ($Z > |3.29|$). We implemented the following

148   strategy for each objective (i.e., prevalence, triggers, functions). First, we used Analyses of

149   Variance (ANOVAs) as a preliminary test of whether the countries differed on each

150   dependent variable, and (for experimental variables) whether country interacted with

151   condition (nostalgia vs. ordinary). These preliminary analyses served to answer the basic

152   question of whether nostalgia or its effects vary across cultures, paving the way for

153   subsequent tests to locate the source and nature of any differences.

154   Our primary analyses tested the effects of country-level predictors (i.e.,

155   individualism/collectivism, wealth, life expectancy, life satisfaction, temperature) on

156   nostalgia prevalence (SNS and BNI), triggers, and functions. We used multilevel analysis in

157   SPSS with Maximum Likelihood estimation, given that individuals were nested within

158   countries. We entered individual-level predictors (e.g., condition) at Level 1. We

159   standardized and entered country-level predictors (e.g., individualism) at Level 2 and tested

160   their main effects and interactions with condition. We allowed each Level 2 intercept and

161   slope to vary randomly across countries, except in a few cases in which we removed a

162   random slope because it prevented a model from converging.

163   We estimated effect sizes by (a) computing the ICC for each dependent variable to

164   indicate the proportion of variance at the individual and country level, and (b) calculating the

165   approximate R^2 for each full model. Following LaHuis et al.'s (2014) recommendation, we

166   used Snijder and Bosker's (2012) method for calculating total multilevel R^2 (Equation 1):

167   $$R^2(S\&B) = 1 - \frac{(\sigma^2_{full} + \tau_{00full})}{(\sigma^2_{null} + \tau_{00null})}$$

168   This method relies on a full model that excludes random slopes, which does not alter the

169   fixed effects (Snijders & Bosker, 2012). Note that, if the ICC is small, the total R^2 that can be

170   explained by Level 2 predictors is necessarily also small.[7]

171   As a final exploratory step, we conducted cluster analyses using Ward's method in an

172   attempt to identify if countries grouped together in their nostalgia tendencies in ways that

173   were not accounted for by the measured Level 2 variables. This approach asked whether there

174   are groups of countries with similar nostalgia profiles and what their commonalities are. Most

175   of the cluster analyses did not identify clearly interpretable groupings and so with one

176   exception (i.e., state affect) we report these only in Supplemental Materials.

177   **Prevalence of Nostalgia**

178   Across the full sample, on the final item of the SNS, the median frequency of

179   nostalgia was "approximately twice per week." Overall, 68% of participants reported

180   experiencing nostalgia once a week or more often. Across countries (Table S1), the median

181   was the same as the overall median in 18 countries, more frequent in 2 countries (i.e.,

182   Portugal, Turkey), and less frequent in 8 countries. Thus, consistent with Hypothesis 1a,

183   nostalgia was frequent on average across cultures, but showed country-level variation.

184   Univariate ANOVAs testing the effect of country were significant for both the SNS,

185   $F(1, 28) = 8.02$, $p < .001$, $\Delta\eta^2 = .08$, and the BNI, $F(1, 28) = 12.31$, $p < .001$, $\Delta\eta^2 = .12$.

186   Moreover, unconditional multilevel models showed that 6.62% of the variance in SNS

187   nostalgia, and 10.50% of the variance in BNI nostalgia, was at the country level. Thus, most

188   variation in nostalgia reflects individual differences, but country plays a substantial role.

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[7] We did not conduct measurement invariance tests across country samples. Such tests are most appropriate
when comparing multiple cultures to a reference sample, which was not our intention. Moreover, recent authors
argue, based on theory and simulation evidence, that measurement invariance tests are over-strict, typically
inconclusive, and have less consequence than previously assumed (Gardiner et al., 2019; Robitzsch & Lüdtke,
2020; Welzel et al., 2021). We note that, if the samples did not show scalar invariance, this additional random
error variance would work against our hypotheses, making our tests relatively conservative.

189   Figure 1 displays each country's mean SNS and BNI graphically; for full statistics see Table

190   S1. Overall, mean SNS and BNI levels were in similar ranges to those found in prior research

191   (SNS means typically ranging from 4.25-4.88; Hepper et al., 2021; Kelley et al., 2022;

192   Layous et al., 2022; Luo et al., 2022; Seehusen et al., 2013; BNI means typically ranging

193   from 3.1-3.3; Batcho, 1995, 1998; Hepper et al., 2021). Countries with notably higher scores

194   than prior means on both nostalgia measures include Finland, India, Portugal, Singapore,

195   Turkey, and USA. Countries with notably lower scores on both measures include Cameroon,

196   Italy, and Russia. Batcho (1998) defined 'high' and 'low' nostalgia based on the top and

197   bottom quartiles of BNI in her sample (3.4 and 2.5 respectively). On this measure, four

198   countries qualify as "high nostalgia" (India, Turkey, Brazil, USA) and none qualify as "low."

199   To understand the cross-cultural variation better, we conducted a series of multilevel

200   models predicting each nostalgia index from country-level predictors (each entered at Level 2

201   in a separate model).[8] As shown in Table 2, and contrary to Hypothesis 1b, SNS nostalgia

202   was relatively higher in countries with greater wealth and life expectancy, each explaining

203   1.4% of the total variance in nostalgia (approximately 21.2% of the country-level variance).

204   The remaining country-level predictors were not significant, and none reached significance

205   for BNI nostalgia.

206   **Triggers of Nostalgia**

207   Overall, participants indicated that nostalgia was most often triggered by Sensory

208   Stimuli ($M = 4.49$, $SD = 1.15$), followed by Psychological Threats ($M = 3.53$, $SD = 1.09$), and

209   least often by Social Gatherings ($M = 2.84$, $SD = 1.23$). However, these ratings varied by

210   country. The three triggers had between 8-16% of the variance at the country-level,

211   warranting examination of country-level predictors. The effects of individualism/

212   collectivism (Hypothesis 2) were not significant (Table 3). Psychological Threat was

213   predicted only by temperature: Participants in warmer countries were more likely to endorse

---

[8] We first conducted exploratory analyses of gender and age (see Summary of Gender and Age Analyses in Supplemental Material). Both nostalgia indices were higher in younger than older (mid-adulthood) participants, consistent with Hepper et al. (2021). Women reported higher nostalgia than men on the SNS but not the BNI, and there were no significant interactions between gender and age nor any curvilinear patterns. For simplicity, and given the lack of hypotheses, we excluded gender and age from the subsequent main country-level analyses.

214   **Figure 1.** *Mean Nostalgia Levels by Country*
215
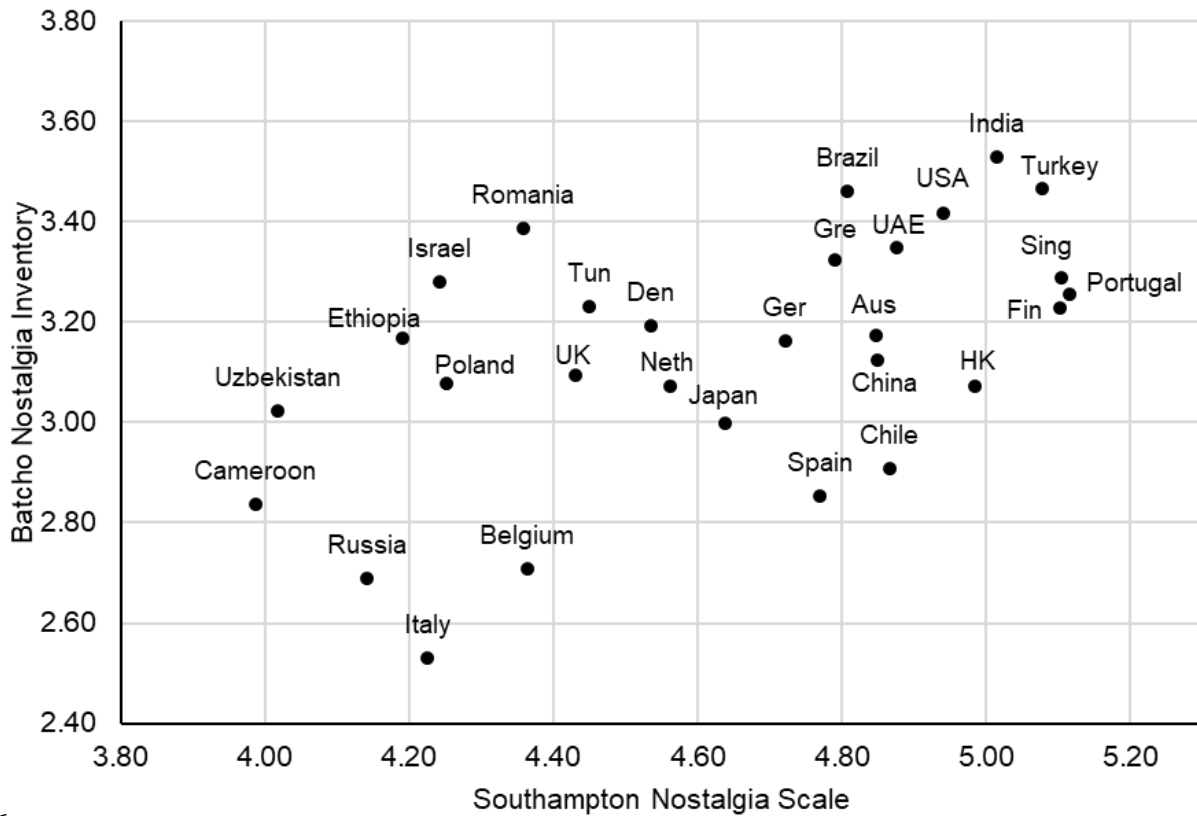
216
217
218   *Note*. Some country names are abbreviated for ease of reading given space constraints. Aus =
219   Australia, Den = Denmark, Fin = Finland, Ger = Germany, Gre = Greece, HK = Hong Kong,
220   Neth = The Netherlands, Sing = Singapore, Tun = Tunisia, UAE = United Arab Emirates,
221   UK = United Kingdom, USA = United States of America.
222

223 **Table 2**

224 *Trait Nostalgia: Multilevel Analyses Testing Effect of Country-Level Variables*

Criterion	Southampton Nostalgia Scale				Batcho Nostalgia Inventory			
Country-level Predictor	F	B	p	R^2	F	B	p	R^2
Individualism	0.33	-0.04	.570	.000	0.42	-0.03	.523	.008
Wealth	**6.58**	**0.15**	**.016***	**.014**	0.03	0.01	.863	.000
Life-expectancy	**6.51**	**0.16**	**.017***	**.014**	0.00	-0.00	.980	.000
Life satisfaction	1.59	0.08	.217	.004	0.01	0.01	.907	.000
Temperature	2.04	0.01	.164	.005	2.82	0.01	.104	.010
ICC	.066				.105			

225 *Note*. Predictors were standardized before analysis and entered in separate models. Criterion
226 variables were retained in their raw scales. ICC = Intraclass correlation; % variance explained
227 by country in unconditional model. R^2 = approximate % in total variance explained by the
228 predictor (Snijder & Boskers, 2012). *$p < .05$, **$p < .01$, ***$p < .001$.

229   these triggers. Social Gatherings and Sensory Stimuli were predicted by indices of

230   development (i.e., wealth, life expectancy, life satisfaction). Participants in more developed

231   countries were more likely to endorse sensory triggers and less likely to endorse social

232   triggers. Again, effect sizes for these predictors were relatively small (explaining up to 4.8%

233   of the total variance, which approximates 14-48% of the country-level variance). Tendencies,

234   then, to experience nostalgia triggered by certain affective or external stimuli once again

235   largely reflect individual differences, but the country-level variation that exists partly reflects

236   differing quality of life or climates.

237   Finally, we inspected the additional open-ended triggers that participants listed. In all,

238   1385 (53.1%) of participants provided at least one, generating a total of 3300. These triggers

239   were translated into English and coded (Krippendorf's α = .949 from double-coding 10%).

240   After excluding responses that did not contain a valid trigger (7.18%), most responses either

241   reflected the 17 triggers we had listed (20.58%) or fit in one of the three broader factors

242   (44.21%) (Table S4). The coding identified 924 (28.00%) valid novel responses. Two

243   independent coders grouped these triggers and resolved discrepancies via discussion. A final

244   27 new trigger categories were identified that were not represented in the original measure

245   (e.g., physical activity, while in bed, while travelling, weather and seasons; see Table S4 for

246   full list, examples, and frequencies). With the caveat that these new triggers were generated

247   by a maximum of 3.5% of the total sample, they could point to new ways of prompting and

248   studying nostalgia that are not biased to Western samples.

249   **Psychological Functions of Nostalgia: Experimental Induction**

250   *Manipulation Check: State Nostalgia*

251   Due to a technical error, all participants in the Brazil sample completed the nostalgia

252   condition, and so we excluded them from analyses, leaving 28 country samples. As shown in

253   Table 4, multilevel analysis indicated that the manipulation check was successful: State

254   nostalgia was higher in the nostalgia (vs. ordinary) condition. On average, the difference was

255   approximately one scale point and condition explained 12% of the total variance. An

256   ancillary 2 (condition) $\times$ 28 (country) ANOVA showed the significant condition effect

257   overall and in 24 out of 28 countries (see Table S5 for ANOVA results and condition effect

258

259 **Table 3**

260 *Triggers of Nostalgia: Multilevel Analyses Testing Effects of Country-Level Variables*

Trigger	Psychological Threat				Social Gatherings				Sensory Stimuli			
Country-level Predictor	*F*	B	*p*	R^2	*F*	B	*p*	R^2	*F*	B	*p*	R^2
Individualism	2.52	-0.11	.123	.011	3.51	-0.17	.072	.022	0.04	0.01	.852	.008
Wealth	0.99	0.07	.327	.004	**9.48**	**-0.25**	**.005**[**]	**.040**	**4.84**	**0.14**	**.036**[*]	**.015**
Life-expectancy	0.69	0.06	.413	.002	**7.65**	**-0.25**	**.010**[*]	**.034**	**8.96**	**0.19**	**.006**[**]	**.023**
Life satisfaction	0.37	-0.04	.547	.001	**6.26**	**-0.21**	**.018**[*]	**.029**	**4.31**	**0.13**	**.047**[*]	**.013**
Temperature	**22.57**	**0.04**	**<.001**[***]	**.048**	1.35	0.02	.256	.007	0.63	0.01	.434	.002
ICC	.101				.155				.087			

261 *Note*. Predictors were standardized before analysis and entered separately. Criterion variables were retained in their raw scales. ICC = Intraclass

262 correlation; % variance explained by country in unconditional model. R^2 = approximate % in total variance explained by the predictor (Snijder &

263 Boskers, 2012). *$p < .05$, **$p < .01$, ***$p < .001$.

264   **Table 4**
265   *State Nostalgia and Psychological Functions by Condition (Multilevel Analyses)*

Dependent variable	Nostalgia	Ordinary	Condition effect			ICC	Condition
	M (*SE*)	*M* (*SE*)	*F*	Random slope	R^2		Mean *d*
State nostalgia	4.56 (0.08)	3.51 (0.08)	124.25***	.082*	.123	.038	0.764
Affect							
Positive Affect	3.62 (0.08)	3.67 (0.08)	0.66	.023	.004	.093	-0.038
Negative Affect	2.04 (0.05)	2.05 (0.05)	0.06	.012	.002	.048	-0.020
Ambivalence[a]	2.21 (0.04)	1.71 (0.03)	46.55***	.002*	.032	.049	0.435
Functions							
Social Connectedness	4.34 (0.08)	3.87 (0.08)	30.57***	.056*	.033	.054	0.352
Meaning	4.76 (0.09)	4.45 (0.09)	24.63***	.022	.020	.104	0.252
Self-esteem	4.20 (0.09)	4.15 (0.09)	0.76	.023	.005	.119	0.045
Self-continuity	4.56 (0.06)	4.17 (0.06)	71.85***	.006	.036	.048	0.378
Optimism	4.33 (0.10)	4.19 (0.10)	8.74**	.002	.010	.166	0.112
Inspiration	4.11 (0.09)	3.93 (0.09)	11.24***	.008	.010	.117	0.140
Satisfaction with Life	4.02 (0.08)	3.89 (0.08)	7.86**	.006	.008	.108	0.117

266   *Note.* Condition was contrast coded (1 = nostalgia, -1 = ordinary). Means were taken from
267   'estimated marginal means' tables in multilevel analysis output. ICC was taken from
268   unconditional model and indicates the variance accounted for by the country level. Random
269   slope of condition is the estimated variance component and indicates whether the random
270   component of the main effect of condition varies significantly by country. R^2 is the total
271   variance explained by condition compared to an unconditional model, estimated from models
272   that excluded the random slope (Snijder & Boskers, 2012). Mean *d* is based on the mean of
273   individual *d* effect sizes per country (reported in Table S5) and is intended to aid comparison
274   with prior literature. All tests excluded Brazil due to a technical error in data collection. [a]
275   Ambivalence analyses were conducted with log-transformed variable but raw means are
276   presented for ease of interpretation.
277   *p < .05, **p < .01, ***p < .001.

278   sizes in each country for all dependent variables; mean effect sizes are shown in Table 4). In

279   three of the four remaining countries (i.e., Ethiopia, India, Tunisia), state nostalgia was

280   directionally higher in the nostalgia (vs. ordinary) condition. In the final country (i.e.,

281   Romania), state nostalgia was high in both conditions ($M_{nostalgia} = 4.44$, $SD_{nostalgia} = 0.91$;

282    $M_{ordinary} = 4.57$, $SD_{ordinary} = 0.90$; Romania reported higher state nostalgia in the ordinary

283   condition than any other sample). The country main effects and Condition × Country

284   interaction effects were also significant.

Preliminary Analyses of Dependent Measures

286   We conducted preliminary multilevel analyses that tested the condition effect alone

287   for each dependent measure (Table 4). On average across cultures, nostalgia (vs. ordinary)

288   yielded significantly higher social connectedness, meaning, self-continuity, optimism,

289   inspiration, and life satisfaction with small or small-medium effect sizes. Surprisingly, the

290   conditions did not differ significantly on overall positive or negative affect, or on self-esteem.

291   However, nostalgia (vs. ordinary) prompted greater ambivalent affect. All dependent

292   variables contained sufficient variance at the country level (i.e., ICC = 5-18%) to examine

293   country-level predictors. Although the condition random slope was only significant for two

294   variables, country-level predictors might nevertheless moderate the *fixed* effect of condition.

295   Moreover, ancillary 2 (condition) × 28 (country) ANOVAs indicated significant Condition ×

296   Country interactions for several variables (i.e., positive affect, negative affect, ambivalence,

297   social connectedness, meaning, self-esteem; see Table S5 for condition effect sizes in each

298   country and ANOVA results). Accordingly, and to test our substantive hypotheses, we

299   proceeded with multilevel analyses that tested the moderating role of country-level

300   characteristics on the condition effect.

Positive, Negative, and Ambivalent Affect

302   The average effect of nostalgia was not significant for positive or negative affect

303   individually, but was significant for ambivalence, providing support for Hypothesis 3b but

304   not Hypothesis 3a. Most countries did not show significant differences between conditions

305   individually, but one (Finland) showed higher positive affect and lower negative affect in the

306   nostalgia (vs. ordinary) condition, whereas six showed higher positive affect in the ordinary

307   condition and three different countries showed higher negative affect in the nostalgia

308   condition (Table S5). Most (n = 18) countries showed significantly higher ambivalence in the

309   nostalgia (vs. ordinary) condition and these effect sizes were medium or large.

310   We report in Table 5 multilevel analyses by condition with country-level predictors.

311   On average, negative affect was higher in cultures that were more collectivistic, warmer, and

312   had lower life-expectancy and life satisfaction. No country-level predictors moderated the

313   condition effect on positive or negative affect. However, four variables moderated the

314   condition effect on ambivalence. We inspected the simple slopes at $M\pm1SD$ on each country-

315   level variable and for each condition (Aiken & West, 1991).

316   Individualism/collectivism moderated the condition effect on ambivalence (Figure 2,

317   panel A). The condition effect was significant for all levels of cultural orientation, but was

318   larger for countries that were relatively individualistic (B = .067, $p < .001$) than collectivistic

319   (B = .039, $p < .001$). The simple effects of cultural orientation were not significant, but in

320   opposing directions: ambivalence was descriptively higher in collectivistic (vs.

321   individualistic) cultures when recalling ordinary memories (B = -.011, p = .356), but

322   descriptively higher in individualistic (vs. collectivistic) cultures when recalling nostalgic

323   memories (B = .017, p = .163).

324   Wealth, life expectancy, and life satisfaction (our three indices of development) also

325   moderated the condition effect on ambivalence (Figure 2, Panels B-D). The three patterns

326   were very similar. The condition effect was consistently significant, but was larger for highly

327   developed countries ($B_{high\ GDP}$ = .070, $p < .001$; $B_{high\ life\ exp.}$ = .064, $p < .001$, $B_{high\ satis.}$ = .068, p

328    $< .001$) than less-developed countries ($B_{low\ GDP}$ = .029, p = .003; $B_{low\ life\ exp.}$ = .034, p = .003,

329    $B_{low\ satis.}$ = .030, p = .002). Accordingly, the effect of country development was not significant

330   in the ordinary condition (B_{GDP} = -.015, p = .204; $B_{life\ exp.}$ = -.002, p = .899, $B_{satis.}$ = -.014, p =

331   .230), but became (significantly or descriptively) positive in the nostalgia condition (B_{GDP} =

332   .026, p = .038; $B_{life\ exp.}$ = .027, p = .037, $B_{satis.}$ = .024, p = .054). These result patterns indicate

333   that participants in more-developed countries experience greater ambivalence accompanying

334   nostalgic reverie. Nevertheless, nostalgia prompted higher ambivalence compared to the

335   control condition across countries.

336 **Table 5**

337 *Psychological Functions of Nostalgia: Main and Moderating Effects of Country-Level Variables (Multilevel Analyses)*

Dependent variable	Country-Level Variable Main Effect (B)					Interaction with Condition (B)					R^2				
	Individ.	Temp.	Wealth	Life-exp.	Satis.	Individ.	Temp.	Wealth	Life-exp.	Satis.	Individ.	Temp.	Wealth	Life-exp.	Satis.
Affect															
Positive affect	.046	-.023	.082	.109	.101	-.022	.010	.023	-.006	.008	.000	.004	.009	.012	.012
Negative affect	**-.117****	**.090***	-.076	**-.097***	**-.144*****	.006	.018	-.030	-.026	-.027	.026	.010	.008	.011	.024
Ambivalence	.003	-.002	.006	.013	.005	**.014***	-.004	**.021****	**.015***	**.019****	.059	.046	.052	.051	.051
Functions															
Social Connectedness	.020	-.089	-.047	.011	.024	.011	-.015	.061	.031	.018	.008	.023	.021	.019	.019
Meaning	-.048	.040	**-.172***	-.183	-.120	-.036	.031	**.060***	.011	-.018	.018	.022	.040	.038	.029
Self-esteem	-.021	.027	-.135	**-.214***	-.065	-.021	.022	.044	.023	-.014	.000	.006	.018	.030	.008
Self-continuity	-.019	-.012	-.009	.055	.022	.029	.008	**.058****	.023	.030	.022	.036	.038	.038	.037
Optimism	-.017	.026	**-.193***	**-.276****	-.092	-.006	.026	.035	-.000	-.003	.011	.010	.033	.052	.015
Inspiration	-.065	.085	**-.203***	**-.319*****	**-.172***	-.006	.017	.049^	.004	.018	.005	.014	.033	.058	.026
State Satisfaction with Life	.126	-.052	.025	.077	**.157***	-.042^	.023	-.031	-.042	**-.051***	.020	.011	.010	.014	.030

338 *Note.* Individ. = Individualism (vs. collectivism). Satis. = Country-level satisfaction with life. Condition was contrast coded (1 = nostalgia, -1 = ordinary) and
339 country-level predictors were standardized. Main effects of condition were very similar to those reported in Table 4 (i.e., all remained significant or not significant
340 respectively) so are omitted for brevity. All models included random intercept and slope for condition. R^2 indicates the total variance explained compared to the
341 unconditional model and was estimated from models that excluded the random slope (Snijders & Bosker, 2012). All tests excluded Brazil due to a technical error
342 in data collection. ^$p < .06$, *$p < .05$, **$p < .01$, ***$p < .001$.

343
344   **Figure 2**

345

346   *Ambivalence by Condition and Country-Level Variables*

347

349
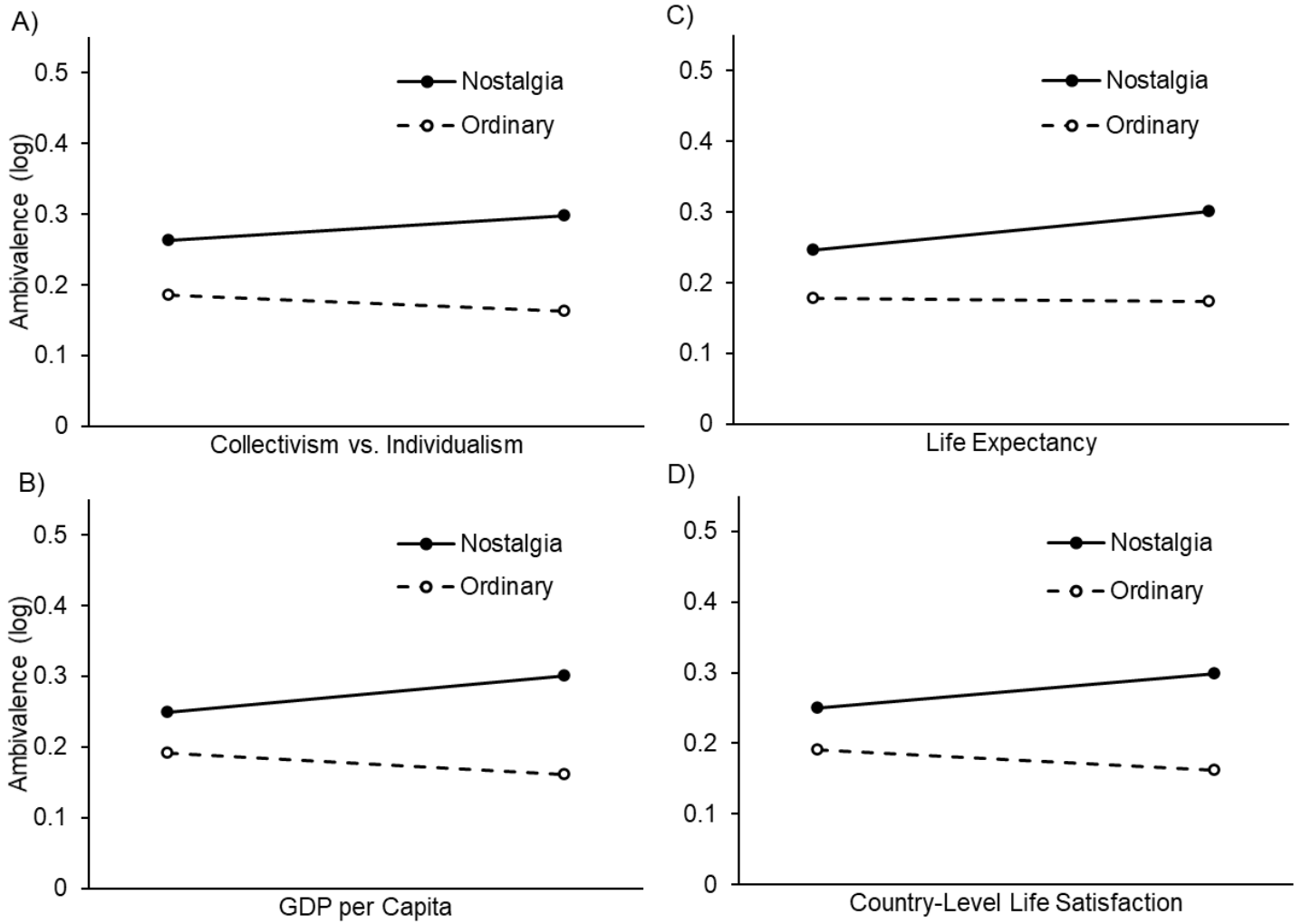
350   *Note.* Panels display: (a) Collectivism vs. Individualism (higher scores indicate higher

351   individualism), (b) Wealth, (c) Life Expectancy, and (d) Life Satisfaction. All x-axes are

352   displayed between M-1SD and M+1SD. The ambivalence y-axis is displayed up to the scale

353   midpoint (i.e., log of 3.5).

354   Given the lack of moderating effects of our country-level variables on positive or negative

355   affect, we explored whether countries grouped in other ways. We conducted Cluster Analysis

356   on the countries' effect sizes (*d*) for condition on positive and negative affect. The

357   dendrogram identified three clusters (see Supplemental Materials for full details). The largest,

358   "positive" cluster contained 11 countries (four Northern European countries, four East Asian

359   countries, Ethiopia, Israel, Russia) in which nostalgia increased positive affect and decreased

360   negative affect (respective *d*s = .182, -.327). Thus, Hypothesis 3a was supported in this group

361   of countries. However, Hypothesis 3b was not supported, as our East-Asian samples showed

362   decreased negative affect. The second, "neutral" cluster contained nine countries (e.g.,

363   Australia, Greece, India, UK, United Arab Emirates) that showed no significant effect of

364   nostalgia on either positive or negative affect (*d*s = .032, .077). The third, "negative" cluster

365   contained eight countries (e.g., Chile, Italy, Portugal, Tunisia, USA) in which nostalgia

366   decreased positive affect and increased negative affect (*d*s = -.420, .295). Overall, the hedonic

367   tone of nostalgic reflection (compared to control) varied across cultures from positive, to

368   neutral, to negative. Nevertheless, effects in all three clusters were small or small-medium,

369   indicating that altered hedonic mood was not a dominant consequence of nostalgia.

370   *Psychological Functions*

371   As per Table 4, participants in the nostalgia condition reported significantly higher

372   levels on five of the six functions as well as satisfaction with life, supporting Hypothesis 4a.

373   These effects also reached significance in a number of individual cultures despite the smaller

374   samples (see Table S5 for effect sizes and significance levels). The largest and most reliable

375   effect of condition was for self-continuity (significant in 14 countries, with no Condition X

376   Country interaction). The condition effects on social connectedness and meaning were

377   significant overall and differed significantly by country, being significant and positive in 11

378   and 9 countries respectively with medium or large effects, with negative (non-significant)

379   effects in 3 countries each and the remaining effects positive and non-significant. The

380   condition effect on self-esteem was not significant overall, but differed significantly by

381   country and was significantly positive in 3 countries with medium-sized effects. The effects

382   on optimism, inspiration and satisfaction with life were each significant overall and did not
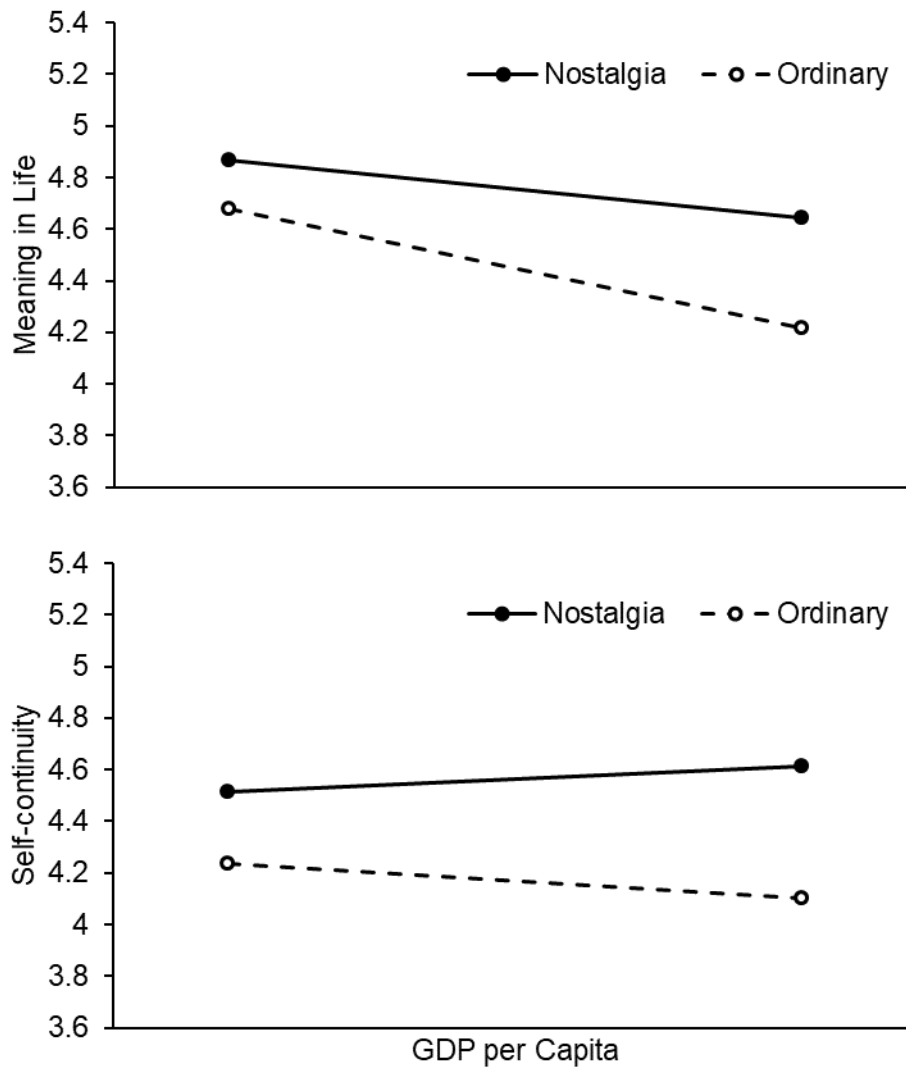
383   differ significantly by country, but due to their small sizes they reached significance in just 2,

384   3, and 3 individual countries respectively.

385   We next conducted a series of multilevel models in which we added country-level

386   predictors as moderators of the nostalgia effect (Table 5). On average, levels of several

387   functions were lower in countries with higher wealth, life expectancy, and life satisfaction.

388   State satisfaction with life was higher in countries with higher overall life satisfaction (as

389   would be expected). Inconsistent with Hypothesis 4b, individualism/collectivism did not

390   moderate the effect of nostalgia on any outcome variable, whether relatively self-related (e.g.,

391   self-esteem) or communal (e.g., social connectedness; Table 5). Temperature and life

392   expectancy also did not moderate the benefits of nostalgia.

393   Country wealth moderated the nostalgia effects on meaning and self-continuity

394   (Figure 3; the equivalent interaction terms for social connectedness and inspiration were ps =

395   .136 and .053, respectively). In both cases, the simple effects of nostalgia were positive and

396   significant for all levels of wealth, but were larger in relatively wealthy countries ($B_{meaning}$ =

397   .215, $p < .001$; $B_{continuity}$ = .255, $p < .001$) compared to poorer countries ($B_{meaning}$ = .095, p =

398   .034; $B_{continuity}$ = .139, $p < .001$). The difference was due to participants in poorer (vs.

399   wealthier) countries reporting higher meaning and descriptively higher self-continuity in the

400   control condition ($B_{meaning}$ = -.232, p = .008; $B_{continuity}$ = -.067, p = .237); this was not the case

401   in the nostalgia condition ($B_{meaning}$ = -.112, p = .163; $B_{continuity}$ = .050, p = .354). Participants

402   in poorer countries may derive meaning and self-continuity from ordinary memories.

403   Country-level life satisfaction moderated the nostalgia effect on state satisfaction with

404   life (Figure 4). The effect of nostalgia was significant for those in countries with relatively

405   low satisfaction (B = .118, $p < .001$), but, in countries with high satisfaction, state satisfaction

406   with life was high in both conditions (nostalgia effect: B = .016, p = .592). Accordingly, the

407   effect of country-level satisfaction was significant in the ordinary condition (B = .208, p =

408   .005), but not in the nostalgia condition (B = .106, p = .128). This pattern supports the notion

409   that nostalgia can buffer low hedonic wellbeing in countries with a lower baseline level of

410   life satisfaction. Overall, Hypothesis 4c was supported for satisfaction with life (i.e., hedonic

411   wellbeing), but other state functions of nostalgia (i.e., eudaimonic wellbeing) manifested the

412   **Figure 3**

413

414   *Meaning in Life and Self-Continuity by Condition and Country Wealth*

415

416

417   *Note.* Predictors on the x-axis are displayed between *M*-1*SD* and *M*+1*SD*.

418

419   **Figure 4**

420

421   *Satisfaction With Life by Condition and Country-Level Wellbeing*

422
423
424   *Note.* The x-axis is displayed between *M*-1*SD* and *M*+1*SD*.

425   reverse pattern.

Exploratory Analysis: Moderation By Trait Nostalgia

427   Some recent evidence indicates that effects of experimentally induced nostalgia may

428   be stronger among, or limited to, participants high in trait nostalgia (Cheung et al., 2016;

429   Layous et al., 2022). To test this possibility, we conducted ancillary multilevel analyses

430   regressing each dependent measure on condition, trait nostalgia (SNS), and their interaction

431   (see Table S7 for details). All main effects of condition remained significant or not

432   significant as reported earlier. Trait nostalgia was significantly and positively associated with

433   all dependent measures except for satisfaction with life. Out of 11 tested interactions, three

434   were significant: ambivalence, social connectedness, self-continuity. In all three cases, the

435   condition effect was positive and significant at all levels of trait nostalgia, but was larger for

436   participants high (Fs ranged from 34.44-55.98, ps < .0005) than low (Fs ranged from 10.83-

437   23.30, ps < .002) in trait nostalgia. The remaining eight interactions were null. Participants

438   benefited from experimentally-induced nostalgia, even if they were low in trait nostalgia.

Discussion

440   We examined, for the first time, systematic cultural differences in the prevalence,

441   triggers, and psychological functions of nostalgia in 29 countries or cultural regions. Across

442   dependent variables, cultural region explained only a small portion of variance, indicating

443   that the operation of nostalgia is largely consistent across cultures and is shaped more by

444   individual-level factors. However, we also identified some country-level effects that show

445   novel—and sometimes unexpected—differences between cultures. We revisit our key

446   questions in light of the findings.

Prevalence of Nostalgia

448   Overall, nostalgia was a common experience across cultures. The two nostalgia scales

449   were internally reliable in each of the 29 samples, supporting the notion that nostalgia is a

450   meaningful concept to participants across cultures. We hypothesized that nostalgia would be

451   experienced at least once per week in most countries (Hypothesis 1a), and indeed the median

452   equaled or exceeded this frequency in all but three samples. Overall, 68% of participants

453   reported experiencing nostalgia once a week or more often. Further, in most countries the

454   median was twice a week—*more* frequent than in previous UK-based studies (Hepper et al.,

455   2021; Wildschut et al., 2006).

456   Nostalgia varied somewhat by country. The highest-nostalgia countries include China,

457   Greece, UK, and USA, where much of the extant nostalgia research has been conducted. This

458   may imply that the nostalgia literature better reflects the operation of nostalgia in high-

459   nostalgic cultures, and may not be wholly representative. Such a concern is mitigated by

460   evidence that similar findings have been obtained in Denmark (Sedikides et al., 2018), Japan

461   (Kusumi et al., 2010), and The Netherlands (Hart et al., 2011), which reported moderate

462   nostalgia levels. That said, future research would do well to include samples from a wider

463   range of countries. The least nostalgic countries were Cameroon, Italy, and Russia. These

464   countries nevertheless endorsed the BNI targets between "a little" and "somewhat nostalgic,"

465   and the SNS items around the scale midpoint—so are better considered nostalgia-neutral than

466   nostalgia-averse. Future research might explore these cultures in more depth.

467   Of the country-level variables that we examined, nostalgia varied by wealth and life-

468   expectancy, with nostalgia being higher in relatively more advantaged countries. This did not

469   support the expected pattern (Hypothesis 1b) that country-level threats would foster higher

470   nostalgia, perhaps because nostalgia was moderate or high in most samples. One speculative

471   reason may be relative deprivation (Jetten et al., 2021; Olson, 1963). Most of the data were

472   collected in 2014-2015, during the economic recession. As such, people in wealthier

473   countries may have subjectively experienced a larger fall than those in less wealthy countries,

474   reverting in part to nostalgia. Alternatively, this finding could reflect the tendency for higher

475   income to engender self-conscious emotions (e.g., pride, contentedness—and perhaps

476   nostalgia), although it does not typically engender social emotions (of which nostalgia is one;

477   Tong et al., 2022). Moreover, future research could examine alternative country-level

478   predictors which might explain more variance.

479   Given the absence of clear country-level groups or predictors of nostalgia, it is

480   unsurprising that findings indicated far more variation *within* countries than *between*

481   countries (i.e., small Intra-Class Correlations). That is, rather than some cultures being

482   consistently nostalgia-prone and others nostalgia-neutral, nostalgia may more accurately

483   reflect person-level individual differences. This pattern aligns with research that has

484   examined nostalgia as a personality trait, which is partly heritable (Luo et al., 2016) and co-

485   occurs with variables such as neuroticism, need to belong, empathy, past-oriented time

486   perspective, counterfactual thinking, and reflection (Cheung et al., 2018; Jiang et al., 2021;

487   Juhl et al., 2020; Newman et al., 2020; Seehusen et al., 2013). It also aligns with research that

488   shows nostalgia to vary according to individuals' recent exposure to psychological threats

489   such as loneliness (Zhou et al., 2008), life changes (Sedikides et al., 2015a), and

490   meaninglessness (Routledge et al., 2011) or disillusionment (Maher et al., 2021). Thus, a

491   person's frequency of, and attitude toward, nostalgia is not determined primarily by the

492   sociocultural context, but rather shaped by their personality and life experiences. Future

493   research could examine personality variation in nostalgia systematically across cultures.

494   **Triggers of Nostalgia**

495   We asked participants to report how often they experienced nostalgia in the context of

496   a range of triggers drawn from prior research and the wider literature. Across countries, these

497   triggers grouped coherently into factors reflecting psychological threats (e.g., loneliness,

498   meaninglessness, discontinuity), social gatherings (e.g., community events, family

499   gatherings), and sensory stimuli (e.g., music, scent). Participants endorsed the sensory

500   triggers as most often evoking nostalgia overall. Again, results revealed modest country-level

501   variation, in the context of greater inter-individual variation.

502   Contrary to expectations (Hypothesis 2), individualism/collectivism did not influence

503   the triggers of nostalgia systematically. Instead, indices of higher development (wealth, life

504   expectancy, and life satisfaction) were associated with endorsing sensory triggers more and

505   social triggers less. One reason might be that participants in more-developed countries tend to

506   derive information and entertainment from media (e.g., internet streaming, smartphones) that

507   are infused with sensory stimuli, whereas those in less-developed countries may have less

508   access to such media and derive information and entertainment more often from

509   conversations and gatherings. If so, this pattern is likely to generalize to other emotions (e.g.,

510   joy, pride, hope).

511   Unexpectedly, participants in warmer countries endorsed psychological threat triggers

512   of nostalgia more than those in colder countries. Perhaps people in warmer countries

513   experience more psychological threat, a notion consistent with reports of higher aggression in

514   warmer than colder climates (Allen et al., 2018). Or perhaps people in warmer countries

515   report more threat due, in part, to their lower subjective well-being (Connolly, 2013).

516   Regardless, replication of this finding is warranted.

517   Participants had the opportunity to add their own triggers. Most of these reflected

518   examples of the triggers we had listed or their broader factors. Overall, participants across

519   cultures recognized nostalgia as being prompted by the same types of trigger—both

520   psychological and external. Given that most prior research has used psychological threat or

521   sensory stimuli (or autobiographical recall) to induce nostalgia, future research ought to

522   examine nostalgia that is triggered by social stimuli, such as festivals or conversations.

523   Further studies could also examine nostalgia in the novel contexts generated by participants,

524   such as while engaged in physical activity, travelling, or surrounded by nature.

525   **Psychological Experience and Functions of Nostalgia**

526   In the experimental component of our investigation, we implemented the Event

527   Reflection Task (Sedikides et al., 2015b) to examine the short-term psychological impact of

528   induced nostalgia (vs. control condition) across cultures. Crucially, the manipulation was

529   successful. The Event Reflection Task significantly induced state nostalgia overall, and in 24

530   of the 28 countries that completed the experiment. These included 17 geographically- and

531   culturally-diverse countries in which the Event Reflection Task had not been used before to

532   our knowledge (e.g., Belgium, Cameroon, Chile, Israel, Singapore). In four countries

533   (Ethiopia, India, Romania, and Tunisia), the Event Reflection Task did not significantly

534   increase state nostalgia. This could partly reflect the positioning of the manipulation check at

535   the very end of the experimental materials, by which time effects could have weakened; for

536   these four countries with the smallest effects in the population, such weakening may have

537   prevented the effect from being statistically significant. Future research could explore

538   whether music or conversation might act as a more effective nostalgia induction in these

539   countries, given their strong endorsement of social triggers. Nevertheless, the Event

540   Reflection Task generally emerged as a valid nostalgia induction method across a wide range

541   of cultures and languages.

542   *Affect*

543   Neither positive nor negative affect differed between conditions, but nostalgia

544   prompted greater ambivalence (coactivation of happiness and sadness). This finding indicates

545   that changes in mood are not the primary consequence of experiencing nostalgia, but the

546   over-riding affective tone is bittersweet, consistent with past theorizing and evidence (Hepper

547   et al., 2012; Leunissen, 2023; Leunissen et al., 2021). This finding is also consistent with

548   evidence that, even when nostalgia entails positive affect, this does not account for

549   nostalgia's benefits (Evans et al., 2021; Cheung et al., 2013; Hepper et al., 2021).

550   Country-level variables did not moderate nostalgia's effect on positive or negative

551   affect. The effect of nostalgia on ambivalence was unexpectedly slightly larger in more-

552   developed countries (i.e., those with higher wealth, life expectancy, and life satisfaction).

553   Previous findings indicated that people in East Asian countries conceptualize nostalgia as

554   more prototypically negative than those in other world regions (Hepper et al., 2014).

555   However, here we found no evidence that nostalgia generated more state negative affect or

556   ambivalence in Asian cultures. Instead, participants in these regions reported more negative

557   affect than others under neutral conditions (i.e., after recalling an ordinary event), but then

558   gained positive affect from nostalgia. Similarly, participants in collectivistic countries

559   reported descriptively more ambivalence in the ordinary condition, but less so than those in

560   individualistic countries following nostalgic recall. Moreover, across conditions, negative

561   affect was higher in countries that were warmer, more collectivistic, and had lower life

562   expectancy and life satisfaction. Thus, the tendency of people in collectivistic cultures to

563   engage with and value negative emotions (Grossmann & Ellsworth, 2017) appears to infuse

564   their general recall habits, but not specifically to characterize or be exacerbated by nostalgia.

565   *Psychological Functions*

566   The literature attests to the state benefits of nostalgia in terms of self, social, and

567   meaning-related psychological functions (Sedikides & Wildschut, 2018, 2019; Sedikides et

568   al., 2015b). Here, we assessed a range of such functions as indices of eudaimonic wellbeing,

569   as well as state satisfaction with life as an index of hedonic wellbeing. The key eudaimonic

570   benefits of nostalgia replicated both overall and individually across most countries. The

571   strongest psychological functions were self-continuity, social connectedness, and meaning.

572   These patterns replicate extensive studies conducted in a handful of mainly Western countries

573   (Abakoumkin et al., 2019; Evans et al., 2021; Hepper et al., 2012; Routledge et al., 2011;

574   Sedikides et al., 2016; Wildschut et al., 2006). Prior nostalgia effects on the self-related

575   functions of optimism (Cheung et al., 2013, 2016) and inspiration (Evans et al., 2021;

576   Stephan et al., 2015) were also replicated overall, but were smaller and did not generalize to

577   all countries. Self-esteem (Evans et al., 2021; Hepper et al., 2012; Wildschut et al., 2006) was

578   the weakest psychological benefit, showing significant boosts only in a subset of countries.

579   The comparative effects of different functions replicate their relative effect sizes in prior

580   research (Ismail et al., 2018). Taken together, all three key pillars of nostalgia functions

581   replicated across cultures, but in the self-related realm people seem to derive a sense of

582   continuity, more than positivity, from nostalgia. This pattern dovetails with the above-

583   described lack of effect on positive affect in most cultures. We nevertheless observed some

584   hedonic benefit: State satisfaction with life was significantly boosted by nostalgia on average.

585   This adds to a growing literature on nostalgia and hedonic wellbeing (Hepper & Dennis,

586   2023; Layous & Kurtz, 2023).

587   As with the other variables, we found modest country-level variation in the

588   psychological effects of nostalgia. Based on the idea that nostalgia is most powerful when

589   buffering threat (Wildschut & Sedikides, 2023a,b), we had anticipated that psychological

590   effects of nostalgia would be stronger in countries exposed to more threats (e.g., cold

591   weather, limited wealth, or unhappiness). Satisfaction with life was the only variable that

592   manifested this threat-buffering pattern, with participants in countries that were generally less

593   happy gaining more from nostalgia. Future studies might test if nostalgia buffers

594   experimentally-induced psychological threats across countries.

595   Some aspects of eudaimonic wellbeing (most strongly, meaning and self-continuity)

596   instead evinced stronger effects of nostalgia in wealthier countries: Although participants

597   across cultures benefited from nostalgia, those in poorer countries gained some of these

598   functions from ordinary memories too. This notion draws attention to a feature of the Event

599   Reflection Task that can be considered both a strength and (in this context) a limitation.

600   Asking control participants to recall an ordinary event from their past is intended as a

601   conservative task that shares cognitive and temporal components with the experimental

602   condition and differs only in its emotional (i.e., nostalgic) focus. However, some participants

603   may use the control task as an opportunity to fulfil psychological functions or appreciate the

604   value in ordinary life—by focusing, for example, on the meaningful relationships that

605   surround them or the routines they have maintained despite life challenges. Using alternative

606   manipulations (e.g., more prescriptive ordinary memory task; Wildschut et al., 2006; music;

607   Barrett et al., 2010) might mitigate this risk in future research that involves diverse samples.

608   The possibility that people in less-advantaged countries can derive eudaimonic wellbeing

609   from ordinary memories warrants examination in future research.

610   **Implications**

611   The findings provide insights into the cross-cultural relevance of nostalgia. Adding to

612   prior evidence that people conceptualize nostalgia similarly across cultures (Hepper et al.,

613   2014), we can now state with a degree of confidence that across cultures nostalgia is a

614   common experience that is triggered by comparable psychological, sensory, and social

615   stimuli, and that can be induced reliably via autobiographical recall. Across variables, there

616   was more similarity than difference between cultures in the reliability, levels, and operation

617   of nostalgia. These patterns imply that other effects of nostalgia might also generalize across

618   cultures. Future studies could examine whether inducing nostalgia in additional cultures is

619   equally capable of buffering personal psychological threats and of promoting prosocial and

620   motivational outcomes. If so, encouraging nostalgia could provide a personal positive-

621   psychology intervention that is readily accessible to people across cultures (i.e., a prevalent

622   concept and emotion) and is fairly easy to implement (i.e., can be induced using personal

623   memories or music). Recent findings (Layous et al., 2022) show that a 6-week nostalgia

624   intervention can increase wellbeing in US students, although after three months the benefits

625   were limited to participants high in trait nostalgia. The present findings, like Cheung et al.

626   (2016), also indicate a small advantage for participants high on dispositional nostalgia even in

627   short-term manipulations. Further evidence is required to develop interventions that are

628   appropriate for different groups.

629   Given that nostalgia is understood and effective across cultures, people should also be

630   able to draw on this resource when relocating to new countries. Migrants, immigrants, or

631   sojourners face numerous adjustment and acculturation stressors; nostalgia may help to buffer

632   these stressors and facilitate coping and integration in the new culture (Sedikides et al., 2009;

633   Zou et al., 2018). Our findings imply that social contacts in one's host/destination country

634   will understand the value of nostalgia and might facilitate its use—nostalgia might transcend

635   language or cultural barriers. Promisingly, Syrian refugees in Saudi Arabia, especially those

636   high on resilience, reaped several key nostalgia benefits (Wildschut et al., 2019). Further,

637   bicultural individuals who recalled nostalgic memories from their host country endorsed

638   more positive acculturation and bicultural identity integration (Petkanopoulou et al., 2021;

639   Zou & Petkanopoulou, 2023). A broader cultural perspective on nostalgia in more diverse

640   samples will add to this picture.

641   More broadly, the cross-cultural consistency of nostalgia raises the possibility that

642   nostalgia has evolutionary relevance. Adding to evidence that people across cultures

643   understand the concept of nostalgia in similar ways (Hepper et al., 2014), they also report

644   similar prevalence, triggers, and short-term psychological benefits of nostalgia. Hence,

645   nostalgia appears to be psychologically adaptive and may serve some similar functions as

646   other self-conscious emotions (e.g., Goetz & Keltner, 2007; Tracy et al., 2020). Our findings

647   indicate that across cultures nostalgia consistently promotes both internally-focused (e.g.,

648   self-continuity, meaning) and socially-focused (e.g., social connectedness) functional

649   responses. Hence, nostalgia's unique affective-cognitive signature might allow it to serve

650   both ego-focused and social control functions (Hupka et al., 1999).

651   There was no evidence that participants used or benefited from nostalgia in ways that

652   reflected their country's individualism or collectivism. Cultural orientation was unrelated to

653   trait nostalgia or triggers. Although participants in more collectivistic countries reported

654   higher negative affect (in both the nostalgia and control condition) and ambivalence (in the

655   control condition), these participants did not differ in any psychological benefits specific to

656   nostalgia. Recent advances suggest that the use of country-level individualism/collectivism

657   may be a somewhat blunt tool for investigating cultural differences in the operation of the

658   self. Vignoles et al. (2016) proposed a seven-factor model of self-construal that characterizes

659   both individual and cultural levels of analysis and goes beyond the traditional two

660   dimensions. Hence, it may be necessary to consider which aspects of

661   individualism/collectivism are relevant to the topic of enquiry and measure them directly.

662   **Limitations and Future Directions**

663   The present investigation moves nostalgia research in a more universal direction, but

664   far from completes the journey. For example, we derived 29 diverse and dispersed samples,

665   but the sampling was partly opportunity-based and did not ensure a systematic cross-section

666   of continents or other country-level variables (e.g., wealth, individualism/collectivism). It is

667   possible that such sampling might have detected stronger effects of country-level variables.

668   As is typical in psychology research, Africa was under-represented. We continue to urge

669   greater examination of psychological functioning in a range of African cultures. Similarly, we

670   examined country-level variables that were considered theoretically relevant, but follow-up

671   work might explore additional national variables (e.g., political instability, a potentially

672   important index of threat) or group countries that share similar characteristics (e.g.,

673   social/economic development). It would also be beneficial to establish more up-to-date norms

674   of countries' individualism/collectivism levels, given that Hofstede's (1990/2010) still-

675   dominant framework relied on data from the 1970s. Future studies might measure each

676   participant's level of interdependence/independence, life satisfaction, and wealth as well as

677   country-level factors. It would also be optimal to measure temperature at the daily local level

678   rather than relying on averages.

679   A perennial issue in cross-cultural research is the equivalence of measures across

680   cultures and languages. Given that people across many cultures understand nostalgia in very

681   similar ways (Hepper et al., 2014), we may be confident that participants were responding to

682   the same construct. However, cultural differences in interpretation or response habits are

683   plausible. As stated, we did not conduct measurement invariance analyses because of

684   criticisms for being unrealistic, often unnecessary, and overstating differences between

685   cultures (Gardiner et al., 2019; Robitzsch & Lüdtke, 2020; Welzel et al., 2021). We did

686   obtain adequate internal consistency for the nostalgia measures in all samples, attesting to

687   their reliability. Nevertheless, we acknowledge the value of further establishing cross-cultural

688   consistency in responses. Examining the content of nostalgia narratives across cultures would

689   also shed light on whether people recall memories with different phenomenological character

690   or valence, or perceive past memories differently if their culture entails greater threat.

691   We focused on personal nostalgia, or nostalgia for one's own past memories.

692   Collective (e.g., national) nostalgia may also play similar psychological roles for people

693   depending on their culture (Smeekes et al., 2018, 2023). Different cultures may feature

694   different types of nostalgia (at different times; cf. Holak & Havlena, 1992). For example,

695   Holak et al. (2005) noted that interpersonal nostalgia (felt when hearing others' memories)

696   and cultural nostalgia (from shared or common experiences) may be especially prevalent in

697   Russia due to family generations often cohabiting and cultural changes after the Soviet era

698   (see also Nourkova & Bernstein, 2010). Similar ideas have been proposed by researchers

699   regarding Central and Eastern Europe, as public opinion surveys indicate a sense of nostalgia

700   for the past communist era (Ekman & Linde, 2005), and in Germany for "Ostalgie" (Boyer,

701   2006). In new decades or generations, novel influences arise in a country or subculture that

702   could alter the prevailing winds of nostalgia. For example, threats induced by the COVID-19

703   pandemic may have increased nostalgia (Huang et al., 2023; Zhou et al., 2022; see Hepper &

704   Dennis, 2023, for a review). Likewise, changes in a country such as political unrest or

705   developmental progress—which may be more influential in relatively poorer countries—

706   could alter the role and functioning of cultural nostalgia over time.

707   When examining psychological functions, we focused on the short-term benefits of

708   experimentally-induced state nostalgia using the Event Reflection Task, which, as discussed,

709   replicate across a large body of extant literature and now across cultures. Research ought to

710   clarify the extent to which these wellbeing benefits are also facilitated by naturally-occurring

711   nostalgia (e.g., long-term correlates of trait nostalgia, short-term effects of nostalgia that is

712   triggered in daily life). *Trait nostalgia* has shown positive associations with wellbeing indices

713   while accounting for temporal or age effects. For example, nostalgia was positively

714   associated with perceived social support after controlling for prior loneliness (Zhou et al.,

715   2008) and with optimism for the future in recent university graduates (Biskas et al., 2019).

716   Dispositionally nostalgic individuals also reported higher meaning in life (Routledge et al.,

717   2012), thriving (Kelley et al., 2022), and were more resilient to mortality salience inductions

718   (Juhl et al., 2010; Routledge et al., 2008). Further, psychological wellbeing increased or

719   sustained with age for participants high in trait nostalgia, but decreased with age for those

720   low in trait nostalgia (Hepper et al., 2021). These findings indicate that being high in

721   nostalgia bolsters resilience to psychological threats and life events, although some evidence

722   questions their generalizability. For example, nostalgia for home in first-year university

723   students predicted positive beliefs *only* if students had maintained contact with previous

724   social groups (Iyer & Jetten, 2011). Thus, the reference of one's nostalgic reverie may

725   influence its efficacy. Also, Newman et al. (2020) reported that a trait "nostalgic intensity"

726   measure correlated with more negative variables than the SNS in students, including negative

727   affect, regret, search for meaning, depression, and lower self-esteem. However, given that

728   nostalgia is triggered by negative emotions (Wildschut et al., 2006), existential doubts (Juhl

729   et al., 2010), deficits in sociality (Zhou et al., 2008), and self-esteem threats (Vess et al.,

730   2012), these correlations may reflect the reverse causal direction (see also Hepper & Dennis,

731   2023). Also, longitudinal findings indicate that nostalgia acts as a response to distress, not

732   vice-versa (Wang et al., 2023a,b).

733   In terms of *nostalgia in daily life*, few studies have used experience-sampling

734   methods. Such studies have observed both positive (Evans et al., 2021; Van Dijke et al.,

735   2019; Zou et al., 2023) and negative (Newman et al., 2020; Newman & Sachs, 2020)

736   associations between daily nostalgia and wellbeing indices, or found that both daily nostalgia

737   and distress were predicted by adverse conditions (Van Tilburg et al., 2018). Measurement

738   and design issues render comparison of their findings difficult (e.g., effects may again reflect

739   the reverse causal direction), and more studies that control for temporal effects are needed.

740   Another way of examining everyday nostalgia experimentally is to induce nostalgia in ways

741   that might occur more frequently than the "most nostalgic experience" used in the Event

742   Reflection Task. Indeed, participants who recall a "typical nostalgic event" reported

743   increased happiness and positive affect (Zhou et al., 2022), and participants who recall "a

744   nostalgic event" report higher eudaimonic well-being (Kelley et al., 2022), giving confidence

745   that effects of the Event Reflection Task are not artefacts of the instruction.

746   Despite the presence of country-level variance and small systematic effects of some

747   country-level variables, most variance in nostalgia functioning was at the inter-individual

748   level. This echoes evidence that other personality-related variables are more similar than

749   different across cultures (Allik, 2005; Hanel et al., 2018). Hence, research ought to examine

750   further the individual-level differences that most influence the way nostalgia operates.

751   Research in Western samples has identified personality moderators of nostalgia such as

752   attachment orientation (Abeyta et al., 2015b; Wildschut et al., 2010) and narcissism

753   (Bialobrzeska et al., 2023; Hart et al., 2011). Also, individuals who are higher on trait

754   nostalgia (Cheung et al., 2018; Layous et al., 2022), higher on resilience (Wildschut et al.,

755   2019), or lower on habitual negative thinking (Verplanken, 2012) appear to be better

756   equipped to make the most of nostalgia's benefits. Much remains to be understood about why

757   these differences emerge and about other variables (e.g., emotion regulation) that might

758   moderate nostalgia.

759   **Constraints on Generality**

760   The reported findings relate to the target population of well-educated young adults

761   across multiple cultures. Our focus on student samples, albeit deliberate for consistency (Van

762   de Vijver & Leung, 1997), restricts generalization. Past studies that included community

763   members have obtained comparable findings (Hart et al., 2011; Hepper et al., 2012; Sedikides

764   et al., 2015a; Zhou et al., 2012b), suggesting that our reliance on student samples may not be

765   problematic. However, Hepper et al. (2021) did find that more-educated participants reported

766   lower nostalgia in a UK community sample. Moreover, in some of our cultural samples,

767   students would arguably be exposed than other residents to more Westernized influences or

768   socio-economic development, and so future research ought to examine this issue. Similarly,

769   age may play a role. Again, studies with mid-life or older adults have shown that across ages

770   nostalgia is triggered similarly by threat (Stephan et al., 2014; Wildschut & Sedikides, 2020)

771   and has parallel short-term wellbeing effects (Abeyta & Routledge, 2016; Cheung et al.,

772   2013; Hepper et al., 2012). Nonetheless, prevalence of nostalgia varies by age. For example,

773 in Greece older women were most likely to be high in nostalgia (Madoglou et al., 2017), and

774 in Russia and Uzbekistan middle-aged and older adults were higher in nostalgia for the USSR

775 than younger adults (Levada Center, 2017). In the UK, nostalgia peaked in younger (under

776 30) and older (over 75) age groups (Hepper et al., 2021). Hence, it would be fruitful to

777 examine age effects and the role of nostalgia in older adulthood across cultures.

778 Despite a large total sample size and adequate statistical power, we also note that the

779 80-100 participants per country that our resources afforded limits generalizability. The

780 unavoidable variation between samples in terms of laboratory setting, recruitment strategy,

781 and compensation may also have caused unknowable bias in responses, although we did our

782 best to standardize materials.

783 **Concluding Remarks**

784 Our research indicated that nostalgia can be regarded as part of the fabric of everyday

785 psychological functioning across a wide range of cultures. With people across countries

786 experiencing nostalgia on a weekly basis or more, when exposed to both internal (e.g.,

787 threats) and external (e.g., music, conversations) triggers, nostalgia surrounds us. In addition,

788 the findings suggest that nostalgia is more than an epiphenomenon—people across cultures

789 who nostalgize gain a sense of self-continuity, meaning in life, and connectedness to close

790 others. Given prior evidence for the wellbeing and behavioral consequences of these benefits,

791 nostalgia may represent an adaptive pancultural emotion that serves to facilitate individual

792 functioning and knit societies together around the world.

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