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To cite this article: Chelsea A. Reid, Jeffrey D. Green, Sophie Buchmaier, Devin K. McSween, Tim Wildschut & Constantine Sedikides (2023) Food-evoked nostalgia, *Cognition and Emotion*, 37:1, 34-48, DOI: [10.1080/02699931.2022.2142525](https://doi.org/10.1080/02699931.2022.2142525)

To link to this article: <https://doi.org/10.1080/02699931.2022.2142525>



Published online: 04 Nov 2022.



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## Food-evoked nostalgia

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### ABSTRACT

In three studies, we examined food as an elicitor of nostalgia. Study 1 participants visualised eating either a nostalgic or regularly consumed food. Study 2 participants visualised consuming 12 foods. Study 3 participants consumed 12 flavour samples. Following their food experiences, all participants responded to questions regarding the profile of food-evoked nostalgia (i.e. autobiographical relevance, arousal, familiarity, positive and negative emotions) and several psychological functions (i.e. positive affect, self-esteem, social connectedness, meaning in life). Study 2 and 3 participants also reported their state nostalgia. Results revealed that food is a powerful elicitor of nostalgia. Food-evoked nostalgia has a similar contextual profile to previously examined elicitors, but is a predominantly positive emotional experience. Food-evoked nostalgia served multiple psychological functions and predicted greater state nostalgia.

### ARTICLE HISTORY

Received 2 June 2022  
Revised 18 September 2022  
Accepted 28 October 2022

### KEYWORDS

Nostalgia; food; taste; autobiographical memory; nostalgia functions

Ambrosio had a memory of eating his family's cheese as a child, and even now could conjure up its sharp tang and the images associated with it: his mother's kitchen, with its gas fires and simmering pots of milk, and the bodega shelves, where it was stored – in each case, surrounded by people, warmth, the past. – Michael Paterniti, *The Telling Room* (2013, p. 53)

Nostalgia, a sentimental longing for one's past (The New Oxford Dictionary of English, 1998), is a self-relevant and social emotion that spans the lifespan and cultures (Hepper et al., 2021; Sedikides & Wildschut, 2022). Nostalgizing frequently entails reflecting on memories of valued relationships (e.g. family, friends, romantic partners), momentous events involving close others (e.g. holidays, anniversaries, cultural rituals), and objects (e.g. keepsakes; Abeyta et al., 2015; Batcho, 1995; Wildschut et al., 2006). Although the yearning involved in nostalgia can create a bittersweet experience (Wildschut & Sedikides, 2022a), the memories reflected upon and the emotions elicited are predominantly positive (Leunissen et al., 2021; Van Tilburg et al., 2019; Wildschut et al., 2006).

In addition to increasing positive affect (Hepper et al., 2012; Zhou et al., 2022), nostalgia confers a variety of benefits that fall within three vital intrapersonal and interpersonal functions: self-orientation (e.g. self-esteem), existentialism (e.g. meaning in life), and sociality (e.g. social connectedness; Sedikides, Wildschut, Routledge, Arndt, Hepper, et al., 2015; Wildschut & Sedikides, 2022a). For example, nostalgia leads to greater accessibility of positive attributes about the self (Vess et al., 2012), more optimism (Cheung et al., 2013), stronger perceptions of life as meaningful (Routledge et al., 2012), lower attachment anxiety and avoidance (Wildschut et al., 2006), and higher perceived social support (Zhou et al., 2008). Put simply, nostalgia is a resource for the self that serves to improve and maintain psychological well-being (Hepper et al., 2021; Kelley et al., 2022; Layous et al., 2021; Routledge et al., 2013).

### Elicitors of nostalgia

Although negative internal experiences (e.g. meaninglessness, self-discontinuity, loneliness) are natural

elicitors of nostalgia, which then serves to buffer against and recover from these threats (Routledge et al., 2011; Sedikides, Wildschut, Routledge, and Arndt, 2015; Wildschut & Sedikides, *in press*; Zhou et al., 2022), individuals can also benefit from nostalgia when the emotion is induced by external elicitors. Unpleasant environmental conditions, such as cold temperature (Zhou et al., 2012) and adverse weather (Van Tilburg, Sedikides, et al., 2018), elicit nostalgia, which then serves a comforting function. Songs or music (Barrett et al., 2010; Cheung et al., 2013; Michels-Ratliff & Ennis, 2016; Routledge et al., 2011), familiar television shows and movies (Wulf et al., 2019), and scents (Reid et al., 2015) also elicit nostalgic reverie. Some of this literature (Cheung et al., 2013; Routledge et al., 2011; Van Tilburg, Sedikides, et al., 2018; Wulf et al., 2019; Zhou et al., 2012) used stimuli to induce nostalgia and examine its outcomes, but the pertinent research questions did not centre on the potency of these elicitors, the contextual and emotional profile of nostalgia experienced through these elicitors, and whether the elicitors predicted all three core nostalgia functions (i.e. self-orientation, existential, sociality). Research on music or songs (Barrett et al., 2010; Michels-Ratliff & Ennis, 2016) and scents (Reid et al., 2015) has addressed these questions in more detail. For example, Michels-Ratliff and Ennis (2016) instructed participants to indicate three songs that made them feel nostalgic, and subsequently these researchers used these songs to generate a personalised playlist of seven similar songs chosen by an internet music site. Fifty-nine percent of the internet-site-selected songs were rated as moderately to highly evocative of nostalgia, and songs evoking greater nostalgia were rated as more autobiographically salient, familiar, arousing, meaningful, and laden with mostly positive but also negative affect.

Our work extends literature on music-evoked (Barrett et al., 2010) and scent-evoked (Reid et al., 2015) nostalgia. Barrett et al. (2010) asked participants to respond to a variety of song excerpts. Twenty-six percent of 6720 brief musical excerpts presented across participants evoked nostalgia (i.e. were rated at least “somewhat nostalgic” in response to the question “How nostalgic does this song make you feel?”). Music evoked greater nostalgia to the extent that the excerpt was more arousing, familiar, autobiographically relevant, and laden with both positive and negative emotions. Music-evoked nostalgia was characterised by positive, negative, and mixed emotions.

Reid et al. (2015) instructed participants to respond to a variety of scented oils. Fifty-three percent of the 1906 scent presentations were rated as at least somewhat nostalgic on the same item used by Barrett et al. (2010). Similar to Barrett et al., scents evoked greater nostalgia to the extent that they were more arousing, familiar, autobiographically relevant, and laden with both positive and negative (but not mixed) emotions. Also, scent-evoked nostalgia both predicted in-the-moment or state nostalgia and vital psychological functions (i.e. self-esteem, social connectedness, meaning in life).

### *Food as an elicitor of nostalgia*

We extended this literature by examining food as an elicitor of nostalgia. Food is a necessity in daily life, and many individuals have more choice over which foods they consume than ever before. Indeed, food experiences skew more positive due to a hedonic asymmetry in which individuals generally select to “only taste or eat those products that they expect to have a pleasant emotional impact” (Desmet & Schifferstein, 2008, p. 299). If food can powerfully elicit nostalgia, then individuals may be able to harness food’s potency in order to reap nostalgia’s psychological benefits.

Food consumption is closely tied to memory. Proust (1922/1960) described the experience of being jolted back to his childhood upon smelling and tasting a tea-soaked cake (madeleine); this sensory experience culminated in a cascade of vivid and specific recollections about his aunt’s bedroom, house, garden, and the entire village of Combray and its citizens (Baudry, 2020). Since Proust’s writing, research has demonstrated a close link between eating behaviour and memory processes (Seitz et al., 2021). Similar neural architecture and neuroendocrine signals underlie these processes. Eating behaviour and memory both rely heavily on hippocampal function (Stevenson & Francis, 2017), and are influenced by ghrelin and leptin (Hsu et al., 2016; Kanoski & Grill, 2017). Memory can affect eating behaviour and vice versa (Higgs & Spetter, 2018). The first demonstration of this relation occurred in the behaviour of the famous patient H. M., who suffered from amnesia and consumed an entire meal immediately after having just consumed the exact same meal but without recollection of having done so (Hebban et al., 1985). Uncontrolled-eating behaviours have also been linked to deficits in episodic memory

among healthy adults (Martin et al., 2018), and glucose consumption enhance the episodic memory of healthy adolescents (Smith & Foster, 2008).

Also, past research on food experiences has generated findings that map well onto nostalgia. Like nostalgia, individuals use food as a resource to cope with adversity (i.e. stress; Stammer et al., 2020). For example, they sought relaxation and familiarity in foods during the early stages of the COVID-19 pandemic (Shen et al., 2020). The emotional profile of food consumption also appears similar to that of nostalgia. Individuals report positive emotions most frequently and negative emotions least frequently in response to memories of food experiences and food consumption, particularly for self-selected foods (Desmet & Schifferstein, 2008).

More importantly, nostalgia and food experiences share links to social connection. Nostalgia is interpersonal, in the sense that it typically revolves around close others (Wildschut et al., 2006). Similarly, “eating is both a personal and social act. The sensual pleasure of eating is subjectively experienced, but it is often undertaken in groups” (Brown et al., 2010, p. 206). Sociality is the core function of nostalgia (Sedikides & Wildschut, 2019; Sedikides, Wildschut, Routledge, Arndt, Hepper, et al., 2015), and food is central to fostering collective and personal identities (Fischler, 1988). Food selection provides individuals with an opportunity to identify with their social groups. When presented with a list of foods, participants prefer foods that are symbolically representative of their culture (Cantarero et al., 2013). Social identity also influences enjoyment of food. Specifically, participants who identify more strongly with a group (e.g. Southern, Canadian), report greater pleasantness of foods associated with their social identities (e.g. fried catfish, maple syrup) compared to alternative foods (e.g. pizza, honey; Hackel et al., 2018). Food is a resource for social connection when belongingness is under threat. For example, nurses and family members of patients diagnosed with dementia report that patients experienced greater joy, belongingness, being respected and cared for, and an awakening of pleasant memories when served traditional foods (i.e. those associated with celebrations/seasons, associated with certain geographic locations, or prepared according to heritage; Hanssen & Kuyen, 2016). Children seeking asylum describe food as providing a sense of sanctuary, belongingness, and feeling of “home” in their new land (Kohli et al., 2010). International students prefer to eat

mostly home-cooked national dishes, because home culture foods are perceived as comforting and as objects of nostalgia. Mealtimes also provide opportunity for bonding and social connection for the international students, who report that it gives them the opportunity to express their cultural identity and pride (Brown et al., 2010).

In addition to potentially powerful links to social connection, nostalgia evoked by foods may also constitute a more complex experience for individuals compared to other triggers (e.g. music, scents), because consumption of food integrates multiple sensory modalities (e.g. sight, scents, texture). Taste and olfaction are inseparably linked, as the experience of flavour arises from “volatiles released from foods and beverages [that] are forces up behind the palate and into the nasal cavity” (Bartoshuk et al., 2019, p. 1003). Olfactory and gustatory flavour signals are automatically integrated to create the perception of flavour, and this integration occurs early in sensory processing (Veldhuizen et al., 2010). Visual cues that accompany food can also enhance food experiences. When consuming foods (e.g. fruit snacks, cookies), seeing the food before (compared to after) smelling the food enhances taste perception, volume consumed, product recommendation, and choice (Biswas et al., 2021). Multisensory engagement is impactful in the formation of autobiographical memories. After visual content (e.g. building seen), a combination of gustatory and olfactory perceptions (e.g. sampling Spanish ham, spices displayed in market) is the second most important theme to emerge in memory recall (Buzova et al., 2020).

Although we are the first to specifically examine the potency, profile, and psychological functions of food-evoked nostalgia, we are not the first to suggest a link between food and nostalgia. In a qualitative examination of nostalgic product consumption, approximately half of interviewees mentioned nostalgic food experiences, which were characterised by foods from childhood, yearning, or special occasions (Vignolles & Pichon, 2014). Also, descriptions of nostalgic foods frequently included memories from childhood, of being cared for by another, and of preparing or sharing foods with close others during special events (Locher et al., 2005). Furthermore, quantitative research indicates that nostalgia is linked to consumer food preferences and behaviours. Individuals intend to revisit restaurants for which they felt nostalgic (Hwang & Hyun, 2013), and nostalgic labels applied to food products increase purchase intentions (Zhou

et al., 2019). Additionally, Japanese who are more seasonally-oriented in purchasing vegetables (i.e. Japanese culture emphasises seasonality) feel nostalgic for a greater number of vegetables and bring to mind more autobiographical memories (Gotow et al., 2022). Finally, nostalgia increases the selection of indulgent over healthy foods, particularly when dining with friends compared to alone or with strangers (Wang et al., 2018).

### Overview and hypotheses

Our research focuses on the evocation of nostalgia through exposure to food experiences. We examined the potency of food as a nostalgia elicitor, the contextual and emotional profile of food-evoked nostalgia, and the ensuing psychological functions. We tested several hypotheses across three studies. Study 1 participants visualised eating either a self-identified nostalgic or regularly consumed food, and they provided ratings regarding the contextual and emotional profile of the food (i.e. autobiographical relevance, arousal, familiarity, positive and negative emotions) as well as several psychological functions (i.e. positive affect, self-esteem, social connectedness, meaning in life). Study 2 participants visualised consuming 12 foods, whereas Study 3 participants consumed 12 flavour samples. Following each food experience, participants in Studies 2–3 provided ratings of each food’s contextual and emotional profile and reported on several psychological functions. Study 2–3 participants also reported their state nostalgia.

In Studies 2–3, we expected that food experiences would evoke nostalgia. Food provides a complex intrapersonal sensory experience (Bartoshuk et al., 2019; Biswas et al., 2021) with a strong social function (Cantarero et al., 2013; Hackel et al., 2018). Therefore, we hypothesised that foods would elicit nostalgia at a level similar to or greater than previously examined elicitors of nostalgia (e.g. songs, scents; Barrett et al., 2010; Reid et al., 2015). In Studies 1–3, we expected food-evoked nostalgia to be similar in contextual and emotional profile to previously examined sensory elicitors. We hypothesised that foods that are familiar, autobiographically relevant, arousing, and laden with positive emotions would be rated as more evocative of nostalgia. Given that negative emotions are less prominent than positive emotions in nostalgic (Leunissen et al., 2021; Sedikides & Wildschut, 2016) and food (Desmet & Schifferstein, 2008) experiences, we expected positive emotions to play

a larger role in predicting food-evoked nostalgia. In Studies 1–3, we hypothesised that food-evoked nostalgia would serve core psychological functions associated with nostalgia more broadly (Hepper et al., 2012, 2014; Sedikides, Wildschut, Routledge, Arndt, Hepper, et al., 2015), and with music-evoked (Barrett et al., 2010) and scent-evoked (Reid et al., 2015) nostalgia more specifically. We hypothesised that food-evoked nostalgia would predict positive affect, self-esteem, meaning in life, and social connectedness. All participants were introductory psychology students (receiving extra credit) at the same U.S. public university.

### Study 1

In Study 1, we used an experimental design to test whether food-evoked nostalgia has a similar contextual profile, emotional signature, and impact on psychological functions as previously examined elicitors of nostalgia (i.e. music, scents; Barrett et al., 2010; Reid et al., 2015).

### Method

#### Participants

We tested 118 undergraduate students (97 women, 21 men;  $M_{\text{age}} = 18.73$ ,  $SD_{\text{age}} = 1.52$ ). Their ethnicity varied: White/Caucasian = 79.7%, Black/African American = 9.3%, Asian/Asian American = 3.4%, Latino/Hispanic = 3.4%, Other = 4.2%.

#### Procedure and measures

Participants accessed an online survey in which they were randomly assigned to identify, visualise, and write about eating either a personally nostalgic food or a food they ate regularly. Examples of foods identified in nostalgic-food condition included pizza, ice cream, spaghetti, banana bread, and burgers, whereas examples of foods identified in the regular-food condition included bagels, potatoes, apples, pizza, and tacos. Participants then indicated (1 = *not at all*, 7 = *very much*) the extent to which the food was nostalgia-evoking (“According to the Oxford Dictionary, ‘nostalgia’ is defined as a ‘sentimental longing or wistful affection for the past’. How nostalgic did this food make you feel?”), arousing (i.e. “How exciting/arousing do you find this food?”), familiar (i.e. “How familiar is this food?”), and autobiographically relevant (i.e. “Please describe your autobiographical association with this food. In other words, how

personally relevant is this food?"). We adapted these questions from Barrett et al. (2010) and Reid et al. (2015). Subsequently, participants reported (1 = *strongly disagree*, 6 = *strongly agree*) their experience of four psychological functions using the State Functions of Nostalgia Scale (Hepper et al., 2012, Appendix B): positive affect (4 items;  $\alpha = .73$ ; e.g. "The food that I wrote about makes me feel happy"), self-esteem (4 items;  $\alpha = .95$ ; e.g. "The food that I wrote about makes me feel good about myself"), social connectedness (4 items;  $\alpha = .90$ ; e.g. "The food that I wrote about makes me feel connected to loved ones"), and meaning in life (4 items;  $\alpha = .95$ ; e.g. "The food that I wrote about makes me feel life has purpose"). Finally, participants indicated (0 = *not at all*, 4 = *very strong*) how they felt on nine positive ( $\alpha = .89$ ; e.g. "awe", "love", "pride") and nine negative ( $\alpha = .93$ ; e.g. "guilt", "shame", "contempt") emotions (Quoidbach et al., 2014). We also calculated a score of mixed emotions according to a formula used in past nostalgia research (Wildschut et al., 2006): mixed emotions = positive emotions + negative emotions – |positive emotions – negative emotions.

## Results

We provide descriptive and inferential statistics in Table 1. First, we carried out a manipulation check. Participants who visualised a personally nostalgic food reported greater nostalgia than those who visualised a regularly consumed food. Our manipulation was effective.

Next, we conducted independent-samples *t*-tests to examine the experienced contextual and emotional profile of food nostalgia and to assess the impact of nostalgic food on psychological functions. Participants reported greater arousal and autobiographical relevance, but not greater familiarity, for nostalgic compared to regularly consumed foods. Also,

visualising a nostalgic food compared to a regularly consumed food resulted in greater positive, but not negative, emotions. Lastly, visualising a nostalgic food compared to a regular food increased positive affect, social connectedness, and meaning in life (albeit marginally), but not self-esteem.

## Discussion

Study 1 builds on prior research by providing initial evidence that nostalgia associated with food has a contextual profile and impact on psychological functions similar to other previously examined external elicitors of nostalgia (e.g. music, scents; Barrett et al., 2010; Reid et al., 2015). Although negative emotions are linked to nostalgia, albeit less prominently than positive emotions (Reid et al., 2015; Sedikides, Wildschut, Routledge, Arndt, Hepper, et al., 2015; Van Tilburg, Wildschut, et al., 2018), food-evoked nostalgia did not significantly increase negative or mixed emotions. The absence of statistically significant differences on some outcomes (e.g. familiarity, self-esteem) may be due to study design. For example, familiarity may not have been rated higher for nostalgic foods compared to the control group, because our control group visualised a food they ate regularly and such foods are likely highly familiar. Furthermore, Barrett et al. (2010) and Reid et al. (2015) provided participants with samples of numerous stimuli and asked them to respond to questions about each sample. Although our Study 1 has the strength of an experimental design, participants only visualised single and idiographic (i.e. personal) food experiences.

## Study 2

Whereas Study 1 relied upon a visualised experience of a single food in an experimental manipulation,

**Table 1.** Effect of nostalgic versus regular foods in Study 1.

	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	<i>M</i> nostalgic food	<i>SD</i> nostalgic food	<i>M</i> regular food	<i>SD</i> regular food
Nostalgia	5.24	116	<.001	.97	5.97	1.13	4.49	1.84
Arousal	2.45	116	.016	.47	5.89	1.37	5.20	1.55
Autobiographical relevance	2.29	116	.024	.42	6.03	1.17	5.42	1.67
Familiarity	0.30	116	.761	.05	6.61	0.87	6.56	0.95
Positive affect	2.18	116	.031	.40	4.99	0.62	4.65	1.02
Social connectedness	3.22	116	.002	.59	4.45	1.19	3.66	1.46
Meaning in life	1.88	116	.063	.43	4.31	1.13	3.73	1.51
Self-esteem	1.47	116	.144	.27	3.90	1.22	3.54	1.46
Positive emotions	3.49	116	.001	.64	3.77	0.74	3.18	1.07
Negative emotions	0.47	116	.644	.08	1.50	0.80	1.44	0.74
Mixed emotions	0.99	116	.320	.18	2.95	1.49	2.71	1.15

Study 2 more closely aligns with the methodology of prior research (Barrett et al., 2010; Reid et al., 2015) by asking participants to rate experiences with a variety of foods.

## Method

### Stimuli

First, we conducted a pilot study to identify the most appropriate foods to use for nostalgia evocation in the main study. Undergraduate students ( $N = 107$ ; 69 women, 31 men, 7 unreported;  $M_{\text{age}} = 19.18$ ,  $SD_{\text{age}} = 1.42$ ) accessed an online survey in which they recalled and wrote about, in a random sequence, experiences with 33 foods (e.g. spaghetti with meatballs, chicken noodle soup, orange slices). For each food, participants indicated how nostalgic it made them feel (1 = *not at all*, 7 = *very much*).

Out of a possible 3,531 (107 participants  $\times$  33 foods) ratings, 3,343 ratings were completed, and we included 3,141 of those ratings in the analysis. We excluded ratings when participants indicated that they had never eaten the food, as strong nostalgic memories are unlikely to be formed for foods that a participant has never consumed. Indeed, when participants indicated that they had never eaten a food, they expressed very little nostalgia for it ( $M = 1.35$ ,  $SD = 1.00$ ; 92.96% of never-consumed foods were rated as a 1 or 2 on the 1–7 nostalgia scale).

Of the 3,141 food ratings, 1,406 (44.76%) ratings were above the scale midpoint (i.e.  $> 4$ ), 491 (15.63%) ratings were at the scale midpoint (i.e. 4), and 1,244 (39.61%) ratings were below the scale midpoint (i.e.  $< 4$ ). We retained for use in the main study the 12 foods (out of 33) with the highest corrected item-total correlations, treating foods as items. These selected foods were: ice cream (.82), popcorn (.78), bacon (.77), homemade cookies (.76), burger (.75), hot dogs (.75), girl scout cookies (.74), macaroni and cheese (.72), French fries (.70), peanut butter and jelly sandwich (.70), watermelon (.68), grilled cheese (.67). (Numbers in parentheses are corrected item-total correlations in the pilot study.) For each of the 12 selected foods, 96%–100% of participants indicated they had eaten it. The selected foods were not necessarily the ones with the highest mean level of nostalgia evocation. In fact, four of the 10 foods with the highest level of nostalgia evocation (i.e. s'mores, hot chocolate, pancakes, mashed potatoes) were not selected.<sup>1</sup>

### Participants

We tested 176 undergraduates (140 women, 36 men;  $M_{\text{age}} = 19.13$ ,  $SD_{\text{age}} = 1.64$ ). Their ethnicity was: White/Caucasian = 80.7%, Black/African American = 9.1%, Asian/Asian American = 2.8%, Latino/Hispanic = 1.7%, Other = 5.7%. The 12 foods (i.e. level 1 units) were nested within 176 participants (i.e. level 2 units), meeting sample size recommendations for multilevel models (Maas & Hox, 2005).

### Procedure and measures

Participants completed an online survey on “reactions to food experiences”. Participants viewed, in random order, instructions for 12 foods selected from the pilot study. For each food, they indicated if they had ever eaten it. If they had not, they moved on to the next food without visualising or providing ratings for it. As demonstrated by the pilot study, participants generally do not experience nostalgia for food they have never consumed. For consumed foods, participants visualised the experience of eating (i.e. taking a bite of, chewing, tasting) the food and wrote about the imagined experience. Then, they provided ratings of the food’s nostalgia evocation, arousal, familiarity, and autobiographical relevance on the items described in Study 1. Participants also completed the State Functions of Nostalgia Scale as in Study 1: positive affect ( $\alpha = .92$ ), self-esteem ( $\alpha = .99$ ), social connectedness ( $\alpha = .97$ ), meaning in life ( $\alpha = .99$ ). Subsequently, they indicated the extent to which they experienced the positive ( $\alpha = .96$ ) and negative ( $\alpha = .95$ ) emotions, as in Study 1. We proceeded to calculate a score of mixed emotions.

Finally, participants completed measures of state nostalgia. One measure (Wildschut et al., 2006) assessed general state nostalgia with three items (e.g. “Right now, I am having nostalgic feelings”; 1 = *strongly disagree*, 6 = *strongly agree*;  $\alpha = .97$ ), and another one assessed nostalgia for 20 specific “objects” from childhood (e.g. “vacations I went on”, “my family house”, “my friends”; 1 = *not at all nostalgic*, 5 = *very nostalgic*;  $\alpha = .92$ ; Batcho, 1995). Demographic questions concluded the study.

## Results

### Do foods evoke nostalgia?

Out of a possible 2,112 (176 participants  $\times$  12 foods) ratings, 1,812 ratings were completed. We present in Table 2 a rank-ordering of foods based on the number of times each food was rated at or above

**Table 2.** Rank order of foods in terms of capacity to evoke nostalgia in Study 2.

Food	Total presentations	Presentations rated as nostalgic	Percentage of presentations rated as nostalgic
Homemade cookies	154	125	81.17
Watermelon	153	117	76.47
Peanut butter & jelly sandwich	136	102	75.00
Ice cream	159	119	74.84
Grilled cheese	155	116	74.84
Macaroni & cheese	155	112	72.26
Burger	154	109	70.78
Popcorn	159	110	69.18
Hot dogs	136	93	68.38
Bacon	145	95	65.52
French fries	167	109	65.27
Girl scout cookies	139	90	64.75
Total	1,812	1,297	71.58

Note: Following Barrett et al. (2010) and Reid et al. (2015), we scored food presentations as evoking nostalgia when participants assigned a rating equal to or greater than the midpoint (i.e. 4–7) on the nostalgia scale (“How nostalgic did [food name] make you feel?”; 1 = not at all, 7 = very much).

the nostalgia scale midpoint (“How nostalgic did [food name] make you feel?”; 1 = not at all, 7 = very much). Of the 1,812 food presentations, 1,297 (71.58%) were rated at or above the midpoint. This value is higher than the 26% of musical excerpts in Barrett et al. (2010) and the 54% of scents in Reid et al. (2015). This high level of food-evoked nostalgia cannot be attributed exclusively to selection of highly nostalgia-evoking foods (see Stimuli section above.) Thus, foods, relative to songs and scents, appear to be potent elicitors of nostalgia.

We tested whether food-evoked nostalgia predicted general and object-specific state nostalgia. Given that we measured both general and object-specific state nostalgia at the person-level, we created a person-level index of food-evoked nostalgia by calculating the average nostalgia rating across all 12 foods (“How nostalgic did [food name] make you feel?”; 1 = not at all, 7 = very much;  $\alpha = .89$ ). We then conducted regression analyses predicting general and object-specific state nostalgia from this index. Participants who experienced greater food-evoked nostalgia reported higher general,  $\beta = .75$ ,  $t(72) = 9.58$ ,  $p < .001$ , and object-specific,  $\beta = .59$ ,  $t(71) = 6.11$ ,  $p < .001$ , state nostalgia.

### What is the profile of food-evoked nostalgia?

Due to the multilevel nature of the data (ratings pertaining to each of 12 foods nested within participants) and the likelihood that responses to food-level measures may not be independent within participants, we used mixed effects multilevel models (Raudenbush & Bryk, 2002). We centred the food-level measures within participants (Singer, 1998). We conducted multilevel model analyses within SAS PROC MIXED using restricted maximum likelihood estimation and an unstructured variance/covariance structure. First, we partitioned the variance in food-evoked nostalgia into between-subjects and within-subjects components by estimating an intercept-only model (Singer, 1998). We obtained an intraclass correlation of .40,  $z = 8.12$ ,  $p < .001$ . Thus, 40% of the total variance in food-evoked nostalgia ratings occurred between participants, thereby confirming that the use of multilevel models to analyze the data is appropriate.

We regressed food-evoked nostalgia on the following food-level predictors: arousal, familiarity, autobiographical relevance, positive emotions, negative emotions, mixed emotions. We controlled for dependence in the data by modelling the intercept as both a fixed and random effect. We developed the multilevel model by taking the following steps. First, we estimated a baseline model in which we treated all context-level predictors as fixed effects only. We then added one context-level predictor at a time as a random effect. We compared each new model to the previous model for a significant decrease in the  $-2 \log$  likelihood to indicate improved model fit. This resulted in a final model where the context-level predictors of arousal, familiarity, and autobiographical relevance were estimated as both fixed and random effects, whereas positive, negative, and mixed emotions were estimated as fixed effects only. We compared this final model to the original baseline model in which all context-level predictors were treated as fixed-effects only and found an improved model fit based on a significant decrease in the  $-2 \log$  likelihood,  $\chi^2(9) = 113.63$ ,  $p < .001$ . Given that this new model showed that the association of food familiarity and food-evoked nostalgia did not vary significantly within participants ( $p = .11$ ), we tested a modified model in which we modelled familiarity as a fixed effect only. This modification did not result in a significant decrease in the  $-2 \log$  likelihood,  $\chi^2(4) = 3.08$ ,  $p > .05$ , indicating that



**Table 3.** Food-evoked nostalgia as a function of food-level measures in Study 2.

Effect	<i>b</i>	<i>df</i>	<i>t</i>	<i>p</i>
Intercept	3.07	174	30.57	<.001
Food arousal	0.34	1629	9.94	<.001
Food familiarity	0.05	1629	1.79	.073
Food autobiographical relevance	0.30	1629	8.04	<.001
Positive emotions	0.28	1629	6.28	<.001
Negative emotions	0.12	1629	1.09	.275
Mixed emotions	-0.03	1629	-0.44	.656

Note: Parameter estimates are unstandardised.

model fit did not improve when the association between familiarity and food-evoked nostalgia was not allowed to vary between participants. Therefore, we retained our model without this modification. We present results of the final in Table 3. Participants reported more food-evoked nostalgia when imagining foods that they found arousing, familiar (albeit marginally), and autobiographically relevant. They also reported more nostalgia when imagining foods that elicited stronger positive, but not negative or mixed, emotions.

### Does food-evoked nostalgia predict psychological functions?

Next, we examined whether nostalgia elicited by food experiences serves similar psychological functions as nostalgia evoked by other external elicitors like music (Barrett et al., 2010) or scents (Reid et al., 2015). Specifically, we used SAS PROC MIXED to run a series of models testing whether food-evoked nostalgia predicted each of four psychological functions: positive affect, self-esteem, social connectedness, meaning in life. We controlled for dependence in the data by modelling the intercepts as both fixed and random effects (Singer, 1998). Higher levels of food-evoked nostalgia predicted significantly greater positive affect, self-esteem, social connectedness, and meaning in life (all  $ps < .001$ ; Table 4).

### Discussion

Study 2 demonstrated that food is a potent elicitor of nostalgia. Indeed, our findings suggest that food is a

**Table 4.** Psychological functions as predicted by food-evoked nostalgia in Study 2.

Function	<i>b</i>	<i>df</i>	<i>t</i>	<i>p</i>
Positive affect	0.41	1635	31.02	<.001
Self-esteem	0.33	1635	21.70	<.001
Social connectedness	0.38	1635	26.82	<.001
Meaning in life	0.30	1635	20.71	<.001

more powerful elicitor of nostalgia than music or scents. Study 2 also provided evidence that foods evoke nostalgia to a greater extent when they are arousing, familiar (albeit marginally), autobiographically relevant, and laden with positive (but not negative or mixed) emotions. Importantly, we showed that food-evoked nostalgia is associated with higher positive affect, self-esteem, social connectedness, and meaning in life.

We observed in Study 2 a notable deviation from the results of previous research on nostalgia elicitors: familiar foods did not evoke more nostalgia. This null finding may be an artifact of the visualisation methodology; that is, participants may find it difficult to fully immerse themselves in imagined food experiences. Additionally, it was necessary for Study 2 participants to be made aware of the stimuli names (i.e. foods) in order for them to visualise the experience, whereas past research on nostalgia elicitors (i.e. scents; Reid et al., 2015) did not identify the stimuli names (i.e. scents) to participants. We sought to account for these limitations in Study 3 by using actual foods.

### Study 3

Study 3 constitutes our closest approximation to the methods of past research on elicitors of nostalgia (Barrett et al., 2010; Reid et al., 2015). Here, we used a variety of jelly bean flavours as food stimuli.

### Method

#### Stimuli

In a pilot study, we aimed to identify the most appropriate stimuli for nostalgia evocation in the main study. To provide participants with a variety of flavours while maintaining a high level of control and consistency in samples (e.g. portion size, texture, appearance), we used Jelly Belly jelly beans. Undergraduate students ( $N = 83$ ; 66 women, 17 men;  $M_{age} = 18.80$ ,  $SD_{age} = 1.07$ ) attended laboratory sessions in which they sampled and wrote about, in a random sequence, 25 jelly beans (e.g. pumpkin pie, cappuccino, toasted marshmallow). For each jelly bean, participants indicated how nostalgic it made them feel (1 = *not at all*, 7 = *very much*). Participants received water and crackers as palate cleansers, and received dietary and food handling information about the stimuli prior to participation.

Out of a possible 2,075 (83 participants  $\times$  25 jelly beans) ratings, 2,062 ratings were completed. Of the

2,062 jelly bean ratings, 885 (42.71%) were above the scale midpoint, 252 (12.16%) were at the midpoint, and 952 (45.95%) were below the midpoint. We retained for the main study the 12 jelly beans (out of 25) with the highest corrected item-total correlations, treating jelly beans as items. The selected flavours were: lemon drop (.52), peach (.51), cinnamon (.50), buttered popcorn (.47), lemon lime (.46), watermelon (.46), Dr. Pepper (.45), sizzling cinnamon (.45), coconut (.44), caramel corn (.44), mixed berry smoothie (.42), and top banana (.41). (Numbers in parentheses are corrected item-total correlations in the pilot study.) The selected flavours were not necessarily the flavours with the highest mean level of nostalgia evocation: five of the 10 flavours with the highest level of nostalgia evocation (i.e. tutti-frutti, bubble gum, cotton candy, A&W root beer, and pina colada) were not selected.<sup>2</sup>

### Participants

We tested 106 undergraduates (80 women, 26 men;  $M_{\text{age}} = 18.63$ ,  $SD_{\text{age}} = 0.87$ ). Their ethnicity varied: White/Caucasian = 82.1%, Black/African American = 7.5%, Asian/Asian American = 3.8%, Latino/Hispanic = 3.8%, Other/Mixed Race = 2.8%. Participation was restricted to those who were neither diabetic nor allergic to food colouring. The 12 foods (i.e. level 1 units) were nested within 106 participants (i.e. level 2 units), meeting sample size recommendations for multilevel models (Maas & Hox, 2005).

### Procedure and measures

Participants arrived at a laboratory for a study on “experiences with food”. As in the Pilot Study, they received water and crackers as palate cleansers along with dietary and food handling information. Next, participants sampled, in a random order, the 12 jelly beans selected from the Pilot Study. For each jelly bean, they provided responses via an online survey on laboratory computers. Although participants were not informed of the flavour name, they thought about what the sample tasted like to them, and wrote about their thoughts and feelings associated with the flavour. Then, they responded to the items assessed in Studies 1–2, rating the flavour’s evocation of nostalgia, arousal, familiarity, and autobiographical relevance. Afterward, they completed the State Functions of Nostalgia Scale: positive affect ( $\alpha = .95$ ), self-esteem ( $\alpha = .99$ ), social connectedness ( $\alpha = .98$ ), meaning in life ( $\alpha = .99$ ). They also indicated the extent to which they experienced positive

emotions ( $\alpha = .96$ ) and negative emotions ( $\alpha = .94$ ) while sampling the flavour. We calculated a score of mixed emotions. Finally, participants reported their general state nostalgia ( $\alpha = .96$ ) and object-specific state nostalgia ( $\alpha = .91$ ), as in Study 2.

## Results

### Do foods evoke nostalgia?

We present in Table 5 a rank-ordering of flavours based on the number of times each flavour was rated at or above the scale midpoint (“How nostalgic does this flavor make you feel?”; 1 = not at all, 7 = very much). Of the 1,272 flavour presentations, 849 (66.75%) were rated at or above the midpoint. This value is higher than the 26% of musical excerpts in Barrett et al. (2010) and the 54% of scents in Reid et al. (2015). The overall high level of food-evoked nostalgia cannot be attributed exclusively to selection of highly nostalgia-evoking flavours (see Stimuli section above). We again conclude that foods are a potent elicitor of nostalgia.

We tested whether food-evoked nostalgia predicted general and object-specific state nostalgia. We formed a person-level index of food-evoked nostalgia by calculating the average nostalgia rating across all 12 foods (“How nostalgic did this flavor make you feel?”; 1 = not at all, 7 = very much;  $\alpha$

**Table 5.** Rank order of flavours in terms of capacity to evoke nostalgia in Study 3.

Flavour	Total presentations	Presentations rated as nostalgic	Percentage of presentations rated as nostalgic
Coconut	106	79	74.53
Cinnamon	106	78	73.59
Lemon lime	106	77	72.64
Sizzling cinnamon	106	77	72.64
Watermelon	106	76	71.70
Mixed berry smoothie	106	74	69.81
Dr. Pepper	106	69	65.09
Lemon drop	106	69	65.09
Top banana	106	66	62.26
Caramel corn	106	63	59.43
Peach	106	61	57.55
Buttered popcorn	106	60	56.60
Total	1,272	849	66.75

Note: Following Barrett et al. (2010) and Reid et al. (2015), we scored flavour presentations as evoking nostalgia when participants assigned a rating equal to or greater than the midpoint (i.e. 4–7) on the nostalgia scale (“How nostalgic does this flavor make you feel?”; 1 = not at all, 7 = very much).

= .80). We then conducted regression analyses predicting general and object-specific state nostalgia from this index. Participants who experienced greater food-evoked nostalgia reported more general,  $\beta = .53$ ,  $t(104) = 6.39$ ,  $p < .001$ , and object-specific,  $\beta = .62$ ,  $t(97) = 7.71$ ,  $p < .001$ , state nostalgia.

### *What is the profile of food-evoked nostalgia?*

Following the same analysis plan as in Study 2, we collected multilevel data (ratings pertaining to each of 12 jelly beans were nested within participants), and used mixed effects multilevel models. We centred the food-level measures within participants. We conducted multilevel model analyses within SAS PROC MIXED using restricted maximum likelihood estimation and an unstructured variance/covariance structure. We partitioned the variance in food-evoked nostalgia into between-subjects and within-subjects components by estimating an intercept-only model. We obtained an intraclass correlation of .25,  $z = 5.78$ ,  $p < .001$ . Thus, 25% of the total variance in food-evoked nostalgia ratings occurred between participants, thereby confirming that the use of multilevel models to analyze the data is appropriate.

We regressed food-evoked nostalgia on the following food-level predictors: arousal, familiarity, autobiographical relevance, positive emotions, negative emotions, mixed emotions. We controlled for dependence in the data by modelling the intercept as both a fixed and random effect. As in Study 2, we developed the multilevel model by taking the following steps. First, we estimated a baseline model where we treated all context-level predictors as fixed effects only. We then took a build-up approach in which we added one context-level predictor at a time as a random effect. We compared each new model to the previous model for a significant decrease in the  $-2$  log likelihood to indicate improved model fit. This practice produced a model in which the context-level predictors of arousal, familiarity, and autobiographical relevance were estimated as both fixed and random effects, but positive, negative, and mixed emotions were estimated as fixed effects only. We compared this current model to the original baseline model where all context-level predictors were treated as fixed-effects only and found an improved model fit based on a significant decrease in the  $-2$  log likelihood,  $\chi^2(9) = 189.07$ ,  $p < .001$ . Hence, we retained this model. We present results of the model in Table 6. Participants reported more food-evoked nostalgia when imagining foods that

**Table 6.** Food-evoked nostalgia as a function of food-level measures in Study 3.

Effect	<i>b</i>	<i>df</i>	<i>t</i>	<i>p</i>
Intercept	4.74	105	49.38	<.001
Food arousal	0.26	1160	7.20	<.001
Food familiarity	0.19	1160	4.94	<.001
Food autobiographical relevance	0.40	1160	8.36	<.001
Positive emotions	0.19	1160	3.73	<.001
Negative emotions	0.27	1160	3.96	<.001
Mixed emotions	-0.06	1160	-1.03	.302

Note: Parameter estimates are unstandardised.

they found arousing, familiar, and autobiographically relevant. They also reported more nostalgia when imagining foods that elicited stronger positive and negative, but not mixed, emotions.

### *Does food-evoked nostalgia predict psychological functions?*

We examined whether nostalgia evoked by food experiences fulfils similar psychological functions as nostalgia evoked by other elicitors. We used SAS PROC MIXED to run a series of models testing whether food-evoked nostalgia predicted positive affect, self-esteem, social connectedness, and meaning in life. We controlled for dependence in the data by modelling the intercepts as both fixed and random effects. Greater food-evoked nostalgia predicted higher positive affect, self-esteem, social connectedness, and meaning in life (all  $ps < .001$ ; Table 7).

### *Discussion*

Study 3's methodology involving multiple tasting opportunities allows for the closest comparison between food-evoked nostalgia and nostalgia elicited by previously examined stimuli, such as music and scents. Accordingly, Study 3 provides the strongest evidence yet that, relative to music and scents, food is a particularly powerful elicitor of nostalgia. Flavours were rated as more evocative of nostalgia to the extent that they were familiar, arousing, autobiographically relevant, and laden with positive and negative (but not mixed) emotions. Food-evoked

**Table 7.** Psychological functions as predicted by food-evoked nostalgia in Study 3.

Function	<i>b</i>	<i>df</i>	<i>t</i>	<i>p</i>
Positive affect	0.40	1165	23.14	<.001
Self-esteem	0.30	1165	18.19	<.001
Social connectedness	0.38	1165	23.03	<.001
Meaning in life	0.30	1165	18.65	<.001

nostalgia also predicted higher positive affect, self-esteem, social connectedness, and meaning in life.

## General discussion

Across three studies, we provided evidence that food is a potent source of nostalgic reverie. Our research indicates that a majority of food experiences (i.e. 72% Study 2; 67% Study 3) elicited nostalgia, a percentage greater than that of musical excerpts (i.e. 26%, Barrett et al., 2010) and scents (i.e. 54%, Reid et al., 2015) which received similar ratings in past research. Additionally, food-evoked nostalgia predicts both general and object-specific state nostalgia.

Consistent with our expectations, and similar to the findings of prior research, food experiences rated as more arousing (Studies 1–3), autobiographically relevant (Studies 1–3), and familiar (Study 3 and marginally in Study 2) elicited more nostalgia. The emotional signature of food-evoked nostalgia appears somewhat distinct from previously examined elicitors in that food-evoked nostalgia is more positive. Positive emotions play a more prominent role in nostalgia than negative emotions, although nostalgia is framed as a bittersweet experience (Frankenbach et al., 2021; Leunissen et al., 2021; Sedikides, Wildschut, Routledge, Arndt, Hepper, et al., 2015; Wildschut & Sedikides, 2022a). Music-evoked nostalgia was characterised by positive, negative, and mixed emotions (Barrett et al., 2010), and scent-evoked nostalgia was characterised by positive and negative (but not mixed) emotions (Reid et al., 2015). In our research, positive emotions were consistently associated with nostalgic food experiences (Studies 1–3), but negative emotions were only associated with food-evoked nostalgia in Study 3, and mixed emotions were unassociated with food-evoked nostalgia (Studies 1–3). Reid et al. (2015) suggested that emotional response patterns may partially depend upon the mode of nostalgia evocation, though method of calculating mixed emotions could also impact outcomes (Leunissen et al., 2021). Indeed, individuals find comfort in food (Troisi & Gabriel, 2011) and may only eat foods that they expect to have a pleasant emotional impact (Desmet & Schifferstein, 2008), but individuals experience relaxation with sad songs (Yoon & Rottenberg, 2021) and at times (i.e. when sad) actively avoid listening to happy songs (Friedman et al., 2012).

Importantly, nostalgia evoked by foods increased positive affect (Studies 1–3) and strengthened three

core psychological functions identified in prior research: self-esteem (Studies 2–3), social connectedness (Studies 1–3), and meaning in life (Studies 2–3, marginal in Study 1). Thus, the findings reinforced the characterisation of nostalgia as an active, adaptive psychological resource (Sedikides, Wildschut, Routledge, Arndt, Hepper, et al., 2015; Wildschut & Sedikides, 2022a). Individuals naturally seek out food as a source of relaxation and familiarity during times of stress (Friedman et al., 2012), and in nostalgia-evoking foods they are likely to find the benefits they seek.

## Implications and future research

Our findings help to explain why some individuals prefer to consume comforting foods when faced with adversity (e.g. isolation; Troisi et al., 2015). Foods that are comforting can help alleviate loneliness (Troisi & Gabriel, 2011), and individuals described their comforting foods as ones that were linked with “a family tradition, a cultural tradition, something eaten for a holiday, something eaten for a significant family event, a part of a participant’s past, or a reminder of home” (Troisi & Gabriel, p. 750). This description is notably similar to the content of nostalgic memories more broadly (Abeyta et al., 2015; Wildschut et al., 2006). Put simply, comforting foods are nostalgia-evoking foods. Indeed, applying nostalgic labels to foods engenders more food comfort (Zhou et al., 2019).

Nostalgia is a resource; the emotion often occurs naturally in response to psychological threats (e.g. loneliness, boredom, grief) and then plays a regulatory role by enhancing psychological well-being (e.g. increasing social connectedness; Reid et al., 2021; Sedikides & Wildschut, 2019; Wildschut & Sedikides, 2022b; Wildschut & Sedikides, *in press*). Our results indicate that food is a particularly powerful tool that can be implemented to cope with challenging circumstances and should be studied in interventions seeking to help those experiencing adversity. Nostalgic foods may be especially useful in helping individuals to cope with threats to belongingness (e.g. attending school or residing in a foreign country; Brown et al., 2010). Interventions will need to balance the benefits of nostalgic foods with the potential drawbacks of indulging – even overindulging – in unhealthy foods (Wang et al., 2018). As Studies 1–2 suggest, benefits may be reaped simply by imagining the food experiences. Alternatively, interventions could implicate nostalgic foods that

are not necessarily indulgent or indulgent foods that arouse nostalgia but are consumed in moderation. Such a practice could provide individuals with an avenue to benefit from the positive affect and psychological impact of food-evoked nostalgic reverie without the unfavourable health consequences associated with negative emotional eating (Devonport et al., 2019).

Admittedly, many of our food stimuli were ones that could be considered indulgent or unhealthy (e.g. homemade cookies, ice cream). Though nostalgia has been linked to a preference for indulgent compared to healthy foods (Wang et al., 2018), the indulgent foods (e.g. fried potato chips; a rice Krispie-style treat) used by Wang et al. appear inherently more nostalgic compared to the healthy options (e.g. mixed nuts, oatmeal high-fiber biscuits) that participants were likely to have had as children. According to Zhou et al. (2019), foods that are more closely connected to one's childhood, family members, or hometowns are more nostalgic. Thus, whether healthy or indulgent foods elicit nostalgia will depend on whether they are closely connected to one's childhood, close others, or momentous occasions. This rationale is consistent with the notion that foods individuals consider to be tasty and healthy are shaped by socio-cultural influences (Shen et al., 2020). For example, our sample of predominantly White, American undergraduate students rated a "burger" as at least somewhat nostalgic in approximately 70% of presentations in our Study 2, but hamburgers were considered among the foods least evocative of nostalgia in a sample of Chinese participants in Zhou et al. (2019). Watermelon, a less indulgent food option, ranked second in nostalgia-evocation among our Study 2 foods, whereas a tofu dish was used as an inherently nostalgic food by Zhou et al.. Our participants would likely attribute little significance to a tofu dish, whereas watermelon may remind them of their childhood summer cookouts. Similarly, a seasonal orientation is linked to greater nostalgia for vegetables (Gotow et al., 2022).

We note that the foods identified (Study 1) and selected (Studies 2–3) may not elicit nostalgia for all individuals regardless of demographics. Our samples consisted primarily of White, female undergraduate students in the southeast United States. For example, one of the nostalgic foods identified in Study 1 was boiled peanuts, a dish unique to this geographical area. We doubt that this food would elicit nostalgia from an individual in another culture.

Study 1 participants were asked to identify their own personally nostalgic food, and foods selected for Studies 2–3 were based on responses from pilot data collected from the same population. We recommend that future researchers and practitioners identify appropriate stimuli based on their specific populations.

Although our research provides compelling evidence that food is an effective elicitor of nostalgia, our choice of food experiences may have suppressed some effects. Studies 1–2 involved visualisations of food consumption. Visual, gustatory, and olfactory factors are all linked in the vividness of an imagined food experience (Tiggerman & Kemps, 2005). Participants in Studies 1–2 were instructed to think about taking a bite of the food, chewing it, tasting it, and considering what the food tasted like. Although these instructions would allow participants to integrate features of the food beyond taste, the difficulty of creating a vivid mental image may have resulted in a less impactful experience. Study 3 involved the physical consumption of jelly beans to allow for a variety of food flavours while maintaining a high level of stimuli control. However, consuming actual buttered popcorn, for example, may elicit a stronger response than consuming a buttered-popcorn flavoured jelly bean. Although our stimuli evoked high levels of nostalgia, the emotion was likely attenuated by an inability to see, smell, feel, and experience the food texture. Thus, incorporating multiple sensory experiences may help individuals to become more fully immersed in nostalgic reverie (Buzova et al., 2020). Incorporating multiple sensory experiences may also be beneficial for individuals who have lower capacity for mental imagery (Marks, 1989). However, general abilities to construct mental imagery are unrelated to mental imagery elicited by music (Küssner & Eerola, 2019). Future research may benefit from more complex, direct comparisons of various nostalgic elicitors and examine whether individual or cultural differences exist in preferred modality of eliciting nostalgia.

## Conclusion

Our opening quote suggests that individuals can conjure treasured moments from their past with the taste of watermelon, homemade cookies, or other personally relevant foods, and conjure the loved ones and positive affect associated with their memories. Our studies documented that food is a potent elicitor of nostalgia, which serves vital psychological

functions. These findings provide further insight into the character of nostalgia and expand upon past research on elicitors of the emotion.

## Notes

1. In the Pilot Study ( $N$  nostalgia ratings = 3,141), the mean level of food-evoked nostalgia across all 33 foods was 3.96 ( $SD = 1.89$ ). In the main study ( $N$  nostalgia ratings = 1,812), the mean level of food-evoked nostalgia across the 12 selected foods was 4.62 ( $SD = 2.03$ ). Although foods for the main study were not selected based on their average nostalgia evoked, the smaller selection of 12 foods used in the main study ( $N = 176$ ) evoked more nostalgia, on average, than the more comprehensive set of 33 foods used in the Pilot Study ( $N = 107$ ),  $t(4,951) = 11.52, p < .001$ .
2. In the Pilot Study ( $N$  nostalgia ratings = 2,062), the mean level of food-evoked nostalgia across all 25 jelly beans was 3.84 ( $SD = 2.10$ ). In the main study ( $N$  nostalgia ratings = 1,272), the mean level of food-evoked nostalgia across the 12 selected jelly beans was 4.44 ( $SD = 2.23$ ). Although foods for the main study were not selected based on their average nostalgia evoked, the smaller selection of 12 jelly beans used in the main study ( $N = 80$ ) evoked more nostalgia, on average, than the more comprehensive set of 25 jelly beans used in the Pilot Study ( $N = 83$ ),  $t(3,332) = 7.83, p < .001$ .

## Acknowledgement

We thank Mary Welch, Jazmine Hasty, Maisy Deans, Aliza Woolf, and Teja Vyavahare for their assistance in data collection. We thank Ashley O'Brien [Russell] and Katie Hancock for their assistance in proofing materials. Declarations of interest: none. Authors listed in order of contribution. Materials and data are available upon request. The authors report there are no competing interests to declare.

## Disclosure statement

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

## Funding

The author(s) reported there is no funding associated with the work featured in this article.

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