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Article

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Nostalgia decreases green consumption: The mediating role of past orientation

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Abstract

Nostalgia, a sentimental longing for one's past, can influence consumption behavior. The present research investigates how nostalgia affects green consumption. Specifically, we propose that high nostalgia, chronic or primed, can lower consumers' preference for green (vs regular) products. Results across four studies show that high-nostalgia consumers have lower preference for green products compared with low-nostalgia consumers. This effect is mediated by past orientation, such that high-nostalgia consumers tend to dwell on the past, which brings preference to the older products, usually regular rather than green ones that have future connotations, they grew up with. In addition, we find that mortality salience (MS) moderates the effect of nostalgia on green product preference, such that the negative effect of nostalgia on the preference for green products would be enhanced (vs mitigated) when MS is high (vs low). Implications for research and practice are discussed.

JEL CLASSIFICATION M3

Keywords

Nostalgia, green consumption, past orientation

Introduction

In the face of increasingly acute environmental pollution, depletion of natural resources, and climate change, there is an increasing recognition of the role consumers could play to counter these adverse changes, such as buying environmentally sustainable products (Mazar & Zhong, 2010). Nonetheless, an interesting paradox exists that while most consumers are often aware of their role in contributing to the greater sustainability their green intentions tend not to translate into green behavior (Bennett and Williams, 2011; Bonini & Oppenheim, 2008). That is, while consumers realize the importance of buying green products, they are often reluctant to change their familiar patterns of behavior or make the necessary sacrifices (e.g., green products are often more expensive than regular products). Thus, it is critical to investigate factors that could enhance or diminish green consumption.

In this vein, prior research on green consumption has shown that, for example, activating status motives (Griskevicius et al., 2010), possessing global cultural

identity (Strizhakova & Coulter, 2013), having greater congruity between political ideology and persuasive appeals (Kidwell et al., 2013), tendency to act pro-socially (Nilsson, 2008), past behavioral manifestations of green consumption, youngness of consumers, income (Straughan & Roberts, 1999), as well as using social norms rather than traditional appeals (Goldstein et al., 2008) could enhance green consumption. Environmental concern, which refers to both a specific attitude and a more general value orientation (Fransson & Garling, 1999), has also been found to influence green consumption. Moreover,

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prior research has found that global risk perception such as financial and perceived performance risks may affect the effect of environmental concern on green consumption (Agarwal & Teas, 2001). It looks like extant literature focuses either on the individual-related factors, such as possessing a global cultural identity (Strizhakova & Coulter, 2013), or on the consumption-related influences, such as financial risks.

Taking a different tack, the present research examines green consumption from a temporal perspective. Generally, consumers can be divided into forward- versus backward-looking people (Keough et al., 1999). Forward-looking consumers are more likely to anticipate the future consequences of their behavior and make plans (Simons et al., 2004; Strathman et al., 1994); while backward-looking consumers tend to think little about the future or its consequences, rather they tend to look back to the past (Keough et al., 1999). It is noteworthy that green consumption is more congruent with the forward- than with the backward-looking temporal perspective. That is, environmentalism is concerned with saving the environment for the future generations (De-Shalit, 1995). Accordingly, we propose that consumers with a forward-looking perspective would be more likely to buy green products than those with a backward-looking perspective.

A prominent manifestation of backward-looking temporal perspective is nostalgia, which refers to a sentimental longing for the past (Wildschut et al., 2010). Nostalgia is rooted in human nature and is regarded as a common experience in our everyday life (Wildschut et al., 2010). For example, Wildschut et al. (2006) found that 16% of their participants experienced nostalgia "at least once a day," and 26% experienced nostalgia "three or four times a week." In particular, nostalgia tends to evoke reminiscence about the past with fondness and a sense of yearning (Havlena & Holak, 1991). In this sense, highly nostalgic consumers tend to have a stronger time orientation toward the past than less nostalgic consumers.

Nostalgia has important functions, such as priming a sense of social connectedness, enhancing positive affect (PA), increasing one's self-regard (Goulding, 2001; Wildschut et al., 2006), and strengthening perceived social support (Sedikides et al., 2008). Prior research has examined nostalgia in the contexts of consumers' charitable giving (Zhou et al., 2012) and in shaping their preferences for music, movie stars, and automobiles (Holbrook and Schindler, 1989, 1994; Schindler & Holbrook, 2003). Interestingly, while the qualitative literature hints at nostalgia being negatively associated with green consumption (e.g., Ger, 1999; Huttunen & Autio, 2010), our search of the literature indicates that there is no behavioral research examining the causal relationship and its underlying mechanism.

To this end, the present research proposes that nostalgia can decrease green (vs regular) product consumption. This

is because a sentimental longing for the past will make people choose older and usually more regular products that they grew up with, rather than newer and usually greener product options. Compared with regular products, green products tend to cause less pollution, cost fewer natural resources, and benefit the environment overall (Gershoff & Frels, 2015; Luchs et al., 2010). Thus, feeling nostalgic will lower the propensity for green consumption. Importantly, we propose that the negative relationship between nostalgia and green consumption is mediated by past orientation. The reasoning is that nostalgia is a backward-looking perspective that leads individuals to be past-oriented, with little consideration about the future or its consequences. In contrast, green consumption is about contributing to the greater sustainability in the future. Thus, nostalgia works through past orientation to lower green consumption. This research focuses on green products (e.g., electric car), no matter they are from old brands (e.g., Ford) or from young brands (e.g., Tesla). Green products are characterized with sustainability and therefore future-oriented (Dangelico & Pujari, 2010). In this sense, nostalgia should lead to less green consumption.

We explore a boundary condition for these effects in terms of mortality salience (MS). Prior research suggests that reminders of one's own death can increase one's preference for indulgent food (Ferraro et al., 2005), luxury goods (Mandel & Heine, 1999), aggressive driving behavior (Ben-Ari et al., 1999), and materialism (Arndt et al., 2004). The reasoning is that making mortality salient will make people desire to indulge more with less consideration toward the future, as it reminds them to enjoy life as much as possible before their impending mortality (Mandel & Heine, 1999). Thus, we propose that when MS is high (vs low), the negative effect of nostalgia on green consumption would be enhanced (vs mitigated).

The rest of the article is organized as follows. We first develop the theoretical arguments and hypotheses for the main effect of nostalgia on green consumption, followed by the mediating role of past orientation underlying this relationship, as well as the moderating effect of MS. We conduct four studies to test the hypotheses, discuss the theoretical and practical implications of our findings, and conclude with future research directions.

Conceptual framework and hypotheses

Conceptual framework

The present research investigates how nostalgia affects green consumption. Specifically, we propose that high nostalgia, chronic or primed, can lower consumers' preference for green (vs regular) products. This effect is mediated by past orientation, such that high-nostalgia consumers tend to dwell on the past, which brings preference to the

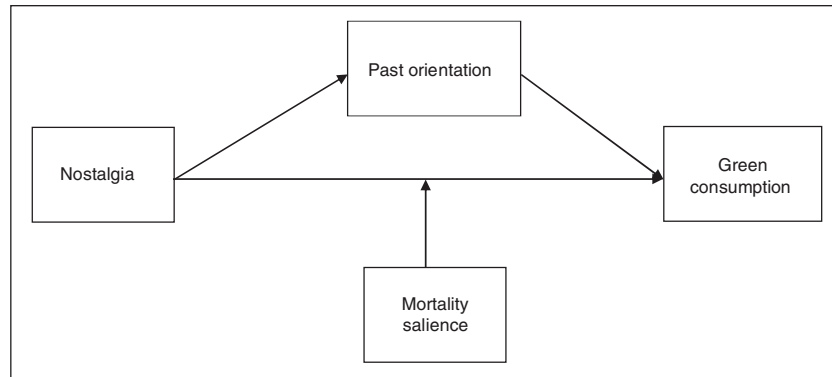


Figure 1. Conceptual framework.

older products, usually regular rather than green ones that have future connotations. In addition, we propose that MS moderates the effect of nostalgia on green product preference, such that the negative effect of nostalgia on the preference for green products would be enhanced (vs mitigated) when MS is high (vs low). Figure 1 demonstrates our conceptual framework. Below find our conceptualization of the main constructs and development of hypotheses.

Hypotheses

The main effect of nostalgia. Nostalgia is the past experienced by the self (Sedikides et al., 2004). It is a social emotion, whereby people often recall nostalgic episodes with close others, such as friends, family members, or romantic partners, often in the context of momentous events, including family reunions, weddings, or anniversaries (Wildschut et al., 2006). Nostalgia differs from remembrance which refers to the action of remembering something, but does not have the emotional overtones. Nostalgia can elicit positive, negative, or mixed feelings (Wildschut et al., 2006). In other words, nostalgia is not only about the time orientation, but also it has emotional implications, as it is frequently triggered by the negative feelings (Wildschut et al., 2006). In this sense, it is also different from past or future orientation, which is not related to emotions. In addition, nostalgia is different from memories in terms of that nostalgia is the past experienced by the self, while memories may be about self and/or others.

With regard to the impact of nostalgia on consumption behavior, the concept of nostalgic bonding referring to “a consumer’s history of personal interaction with a product during a critical period of preference formation that occurs roughly in the vicinity of age 20 . . . can create a lifelong preference for that object” (Holbrook & Schindler, 2003, p. 109) explains it well. For example, a series of studies conducted by Holbrook and Schindler (1989, 1994) show that consumers tend to develop strong and steady preferences in terms of musical tastes for pop songs by the time they reach approximately 23.5 years of age, for their favorite movie

stars around the age of 14, and for Academy Award-winning motion pictures around the age of 27. Beyond the cultural arts, this effect also holds for durable and utilitarian products, such as automobiles, whereby male consumers’ preferences for automobile styles are typically formed by the time they reach 26-year old (Schindler & Holbrook, 2003). These old and familiar products tend not to be green or environmentally sustainable. Nostalgia focuses one’s attention on the self (Wildschut et al., 2006), while an altruistic motive must precede one’s green consumption (Mazar & Zhong, 2010). Therefore, we propose that nostalgia would decrease green consumption. More formally:

H1. Nostalgia exerts a negative impact on green consumption.

The mediating role of past orientation. Nostalgia, in its nature, refers to an orientation toward the past. Time perspective theory proposes that our view of ourselves, our relationships, and the surrounding world is influenced by different temporally based cognitive processes (Gonzalez & Zimbardo, 1985; Zimbardo et al., 1997). Personal experiences are filtered through three different time perspectives—past, present, and future. These perspectives are formed at an early age and affected by family, education, society, religion, and culture (Zaleski, 1994). Nonetheless, people can have different time perspectives depending on the situation. Although this theory suggests that people should have a balanced time perspective, so that flexible transitions among the three temporal orientations will happen in the appropriate situation, specific time orientations may be used too much or too little, resulting in a biased view toward the world (Keough et al., 1999).

In general, future-oriented individuals excel in setting plans and achieving long-term goals. They are willing to sacrifice present enjoyment for future gains because of their ability to anticipate and articulate negative consequences due to tempting behaviors (Keough et al., 1999). They are good at visualizing their goal states that can affect their present decisions, although their ambitions may often

result in the neglect of social relationships. In contrast, past-oriented individuals are characterized by honoring traditions and are good at reviewing past experiences. They like familiar things and are reluctant to change the status quo (Keough et al., 1999). People who value the present may be seen as in the middle, if future and past orientations are two extremes. Present-oriented people are able to enjoy the moment, influenced by neither future anxieties nor past worries (Keough et al., 1999).

Although nostalgia is closely related to past orientation, they are two different constructs. First, nostalgia is a sentimental longing for the past, which is emotion-intensive (Sedikides et al., 2004), while past orientation refers to that an individual creates a bias of overarching cognitive response that helps to interpret the meaning of personal experience, which elicits a mix of cognition, affect, and behavior (Holman & Silver, 1998).

In this vein, we propose that a past orientation triggered by the nostalgic social emotion is negatively associated with green consumption behavior and attitudes. This is because green consumption refers to the consumption of environmentally sustainable products or products that have a positive environmental impact (Olsen et al., 2014). Such concerns about sustainability or environmentalism have future-oriented connotations (De-Shalit, 1995). As nostalgia is a backward-looking social emotion, we propose that the negative effect of nostalgia on green consumption is mediated by a past orientation. More formally, we hypothesize that:

H2. The negative effect of nostalgia on green consumption is mediated by consumers' past orientation.

The moderating role of MS. Beyond the hypothesized main and mediating effects, we are also interested in understanding the boundary conditions of these effects. To this end, we explore the moderating role of MS. Our conjecture that highly nostalgic consumers tend to have a past orientation that lowers their preference for green consumption rests on the assumption that the situation is conducive for the activation of a past orientation. Potentially, one such contextual variable that could mitigate these effects is MS.

As derived from terror management theory, MS refers to when an individual becomes aware that his or her death is inevitable (Rosenblatt et al., 1989). Prior research shows that making mortality salient will lead consumers to indulge more or save less, as it reminds them to enjoy life as much as possible before their impending mortality (Mandel & Heine, 1999). In addition, MS can lead to overconsumption in the form of increasing purchase intention toward luxury brands (Mandel & Heine, 1999), consuming more pleasurable items, such as entertainment and clothing (Kasser & Sheldon, 2000), and purchasing and eating large quantities of foods (Mandel & Smeesters, 2008).

Mortality salience differs from either emotional nostalgia or cognitive past orientation. It reminds people of their inevitable death, so a time perspective is embedded. However, it also causes existential anxiety which is emotional. By extension, we propose that MS will enhance the negative effect of nostalgia on green consumption. As just mentioned, MS is embedded with a time perspective; that is, it reminds consumers of their inevitable mortality in the future. If consumers become aware of their impending death (i.e., high MS condition), most of them would be more concerned about enjoying their remaining days caused by the existential anxiety and less concerned about sustainability. In contrast, when the intervention is low MS, such as a potentially painful visit to the dentist, but not impending death (Rosenblatt et al., 1989), participants will lean toward green consumption. This is because their desire to overcome a temporarily painful episode implies a future-based outlook, in that they have much to look forward to in life, leading them to care more about sustainability. Thus, low MS will offset the effect of nostalgia. More formally, we hypothesize that:

H3. The effect of nostalgia on green consumption is moderated by MS, such that high (vs low) MS will enhance (vs mitigate) the negative effect of nostalgia on green consumption.

Methodology

We conducted four experiments to test the hypotheses. Study 1a demonstrated that chronic (measured) nostalgia had a negative effect on green consumption. Study 1b replicated these findings by priming nostalgia. Study 2 established the mediating role of chronic past orientation. Study 3 examined the moderating role of MS on the relationship between nostalgia and green consumption. SPSS software was used to implement the statistical analyses.

Study 1a: chronic nostalgia and green consumption

The aim of Study 1a is to test the main effect of nostalgia on green consumption. We hypothesize that nostalgia is negatively related to green consumption (H1).

Method. We recruited 162 participants via Amazon's MTurk (41.4% female; $M_{age} = 34.6$ years). We measured chronic nostalgia using the Southampton Nostalgia Scale (SNS; Routledge et al., 2008; 1 = *strongly disagree* and 7 = *strongly agree*; $\alpha = .91$). Participants read the following scenario: "You need to buy additional batteries for home use; you go to a super-store and find the following new brand of battery on the shelf." Then they saw an image of the same battery regardless of the condition (green or regular) they were in. In the green product condition, there was

a logo of a green tree with the words “rechargeable and recyclable.” In the regular condition, the logo depicted the words “power up” (Appendix 1). Participants were randomly assigned to either of the two product conditions ($n_{\text{green}} = 76$, $n_{\text{regular}} = 86$) and asked to indicate whether they were familiar with the brand promoted in the scenario (1 = *yes*, 0 = *no*), their purchase likelihood for this brand of battery on a 7-point Likert-type scale (1 = *very unlikely*, 7 = *very likely*), and how green they perceived the battery was on a three-item 7-point Likert-type scale.

We adapted a three-item 7-point semantic differential scale to measure participants' attitudes toward the promoted battery (Tormala & Petty, 2002; $\alpha = .93$). In addition, we measured several other constructs that could potentially confound the results and controlled them in the subsequent analyses. Specifically, these constructs include extraversion (Francis et al., 1992; $\alpha = .96$), involvement (Kramer, 2007; $\alpha = .80$), and mood (*very sad*–*very happy*), all measured on 7-point scales. Mood was included as a potential confound variable since prior research shows that positive (vs negative) moods cue distal and abstract (vs proximal) construal and thus make the long-term (vs immediate and concrete) goals more salient (e.g., Gardner et al., 2014) and long-term goals are positively related to green consumption (Sheth et al., 2011). Details of all measures are shown in Appendix 2. Finally, participants reported their demographic information.

Age, which is also concerned with the passage of time, can be correlated with some of the central constructs of our study. For example, older (vs younger) consumers, as they have more experience with products and services, can have more nostalgia. Similarly, mortality will be much more salient for older consumers, as they are closer to their death. Therefore, we include age as an important variable to control in our subsequent analysis.

Results and discussion. First, we checked the manipulation and found participants rated the battery in the green condition as more green ($M_{\text{green}} = 4.76$) than the battery in the regular condition ($M_{\text{regular}} = 3.44$; $t(160) = -7.12$, $p < .001$). Next, we ran a regression analysis with purchase likelihood as the dependent variable and nostalgia score, product greenness, and their interaction ($VIF < 10$) as the independent variables, taking into account all the control variables, $F(1, 152) = 3.99$, $p < .001$. Results revealed a significant interaction between product greenness and nostalgia ($\beta = -.28$, $t(152) = -2.69$, $p < .01$; see Table 1). None of the main effects was significant ($ps > .05$). Familiarity with the promoted battery ($\beta = .30$, $t(152) = 3.76$, $p < .001$) was also significant. No other control variable was significant ($ps > .10$).

To further illustrate this effect, we conducted a multiple regression analysis, $F(1, 67) = 7.67$, $p < .001$, with purchase likelihood for the green product as the dependent

Table 1. Regression analysis results (Study 1a).

Dependent variable: purchase likelihood	Model 1	Model 2	Model 3
Control variables			
Gender	.07 (.22)	.07 (.22)	.09 (.22)
Age	-.10 (.01)	-.10 (.10)	-.07 (.01)
Extraversion	-.02 (.09)	-.02 (.09)	-.01 (.08)
Involvement	.09 (.15)	.09 (.15)	.09 (.15)
Familiarity	.32*** (.40)	.32*** (.40)	.30*** (.39)
Mood	.09 (.15)	.09 (.11)	.09 (.10)
Independent variables			
Nostalgia	-.18* (.08)	-.18* (.08)	.03 (.12)
Product greenness		.00 (.22)	.01 (.22)
Nostalgia \times product greenness			-.28** (.17)
Constant	2.98	2.98	1.98
F	3.97**	3.45**	3.99***
R ²	.15	.15	.19
R ² change	.15	.00	.04
Adj. R ²	.11	.11	.14

Values in the parentheses are standard errors.

* $p < .05$; ** $p < .01$; *** $p < .001$.

variable and nostalgia score as the independent variable, taking into account all the control variables. Results revealed that nostalgia exerted a significant negative influence on purchase likelihood for the green battery ($\beta = -.25$, $t(67) = -2.65$, $p < .05$) while gender ($\beta = .20$, $t(67) = 2.22$, $p < .05$) and attitudes toward the promoted battery ($\beta = .52$, $t(67) = 5.11$, $p < .001$) also significantly influenced purchase likelihood for the green battery. No other control variable was significant ($ps > .10$).

We conducted the same analysis on purchase likelihood for the regular battery. The multiple regression analysis, $F(1, 77) = 6.07$, $p < .001$, results showed that nostalgia ($\beta = -.09$, $t(77) = -.98$, $p > .30$) did not significantly affect purchase likelihood for the regular battery. Attitudes toward the promoted battery ($\beta = .50$, $t(77) = 5.29$, $p < .001$) and familiarity with the promoted battery ($\beta = .20$, $t(77) = 2.02$, $p < .05$) significantly influenced purchase likelihood for the regular battery. None of the other control variables was significant ($ps > .10$).

These findings indicated that nostalgia was negatively related to green purchase intention. Specifically, highly nostalgic consumers had lower purchase likelihood for the green battery, while less nostalgic consumers had higher purchase likelihood for the green battery. These results supported H1. While Study 1a measured chronic nostalgia, we are interested in replicating the findings through priming nostalgia. In addition, as battery is a low involvement item, we seek to examine a high-involvement product. We conducted Study 1b to address these issues.

Study 1b: primed nostalgia and green consumption

To provide further evidence for H1, we conducted Study 1b by priming participants' nostalgia and using a different set of products.

Method. Study 1b used a 2 (nostalgia: nostalgia vs control) \times 2 (product greenness: green vs regular) between-subjects design. Participants were 206 consumers (51.9% female, $M_{\text{age}} = 32.3$ years) recruited via Amazon's MTurk. They were randomly assigned to one of the four study conditions. For the nostalgia condition, 48 and 51 participants were in the green versus regular product conditions, respectively. For the control condition, 55 and 52 participants were in the green versus regular product conditions, respectively.

We primed nostalgia using the procedure from the study of Wildschut et al. (2006, Study 5), which has been found to be effective in other studies (Routledge et al., 2011; Zhou et al., 2012). In the nostalgia condition, participants read a short description that asked them to "bring to mind a nostalgic event in your life. Specifically, try to think of a past event that makes you feel most nostalgic. Take a few moments to think about the nostalgic event and how it makes you feel." In the control condition, participants were asked to "bring to mind an ordinary event in your daily life an event that took place in the last week. Take a few moments to think about the ordinary event and how it makes you feel." Subsequently, they were asked to write down four keywords relevant to the event. Manipulation check items consisted of three items: "Right now, I am feeling quite nostalgic," "Right now, I am having nostalgic feelings," and "I feel nostalgic at the moment" (1 = *not at all*, 7 = *very much*; Wildschut et al., 2010; $\alpha = .98$).

Following that, participants read the following scenario: "You need to buy a new refrigerator; you go to a superstore and find the following new refrigerator." Then they saw an image of the same refrigerator regardless of the green or regular condition. In the green product condition, there was a logo with the words "Energy saver," while in the regular condition, the logo depicted the words "Fresh food idea" (Appendix 1). Participants were randomly assigned to one of the two product conditions ($n_{\text{green}} = 103$; $n_{\text{regular}} = 103$) and then indicated their purchase likelihood for this refrigerator on a three-item 7-point Likert-type scale (*very unlikely*–*very likely*, *very impossible*–*very possible*, *very improbable*–*very probable*; $\alpha = .93$).

Similar to Study 1a, Study 1b measured extraversion and involvement as control variables. However, we did not measure familiarity with the brand as there was no brand depicted in the product stimuli. Mood was measured using three 7-point Likert-type items (*very sad*–*very happy*, *very negative*–*very positive*, *very bad*–*very good*; $\alpha = .94$). In

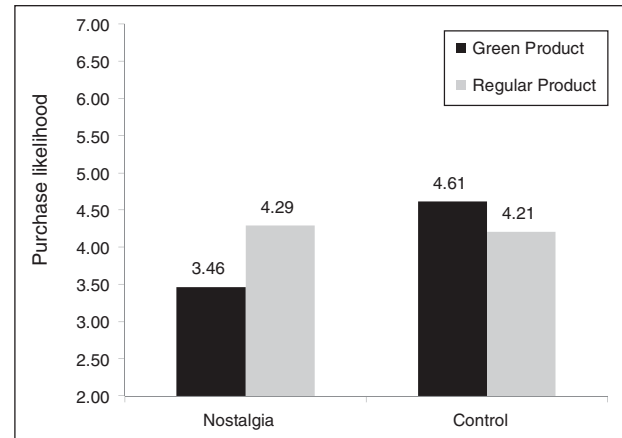


Figure 2. The moderating effect of product greenness (Study 1b).

addition, as the nostalgia manipulation may influence consumer affect, we incorporated the 20-item Positive and Negative Affect Schedule (PANAS) scale (Watson et al., 1988) after the priming of nostalgia. We also asked participants to indicate the extent to which they could imagine themselves in the previously stated scenario on a 7-point Likert-type scale (*not at all very much*) and the extent to which they were aware of what the survey was about (*not at all very much*).

Results and discussion. Participants in the nostalgia condition scored significantly higher on the index than did those in the control condition ($M_{\text{nostalgia}} = 5.18$, $M_{\text{control}} = 3.97$; $t(204) = -5.17$, $p < .001$). This suggested that our priming of nostalgia was successful. Participants rated the refrigerator in the green condition as more green ($M_{\text{green}} = 4.47$) than the refrigerator in the regular condition ($M_{\text{regular}} = 4.19$; $t(204) = -2.04$, $p < .05$).

We next conducted a 2 (product greenness) \times 2 (nostalgia manipulation) analysis of covariance (ANCOVA) on purchase likelihood, taking into account all the control variables. The main effect nostalgia prime, $F(1, 192) = 8.41$, $p < .01$, was significant. Those in the nostalgia condition reported a significantly lower purchase likelihood ($M = 3.89$, $SD = 1.60$) than those in the control condition ($M = 4.41$, $SD = 1.51$). Purchase likelihood for those in the green product condition ($M = 4.07$, $SD = 1.66$) did not differ from those in the regular product condition ($M = 4.25$, $SD = 1.49$, $p > .10$). More importantly, results yielded a significant interaction effect between product greenness and nostalgia manipulation on purchase likelihood, $F(1, 192) = 8.68$, $p < .01$. Specifically, participants who initially had been primed with nostalgia reported a lower purchase likelihood for the green versus regular products ($M = 3.46$, $SD = 1.67$ vs $M = 4.29$, $SD = 1.44$, respectively; $t(97) = 2.66$, $p < .01$; see Figure 2). This difference in purchase likelihood, however, did not emerge in the control condition

($M=4.61$, $SD=1.46$ vs $M=4.21$, $SD=1.55$, for the green vs regular product conditions, respectively; $p > .10$). Age, $F(1, 192)=8.68$, $p < .01$, and attitudes toward the refrigerator, $F(1, 192)=57.11$, $p < .001$, were also significant. No other control variable was significant ($ps > .10$).

To further illustrate this effect, we subsequently conducted a multiple regression analysis on purchase likelihood for the green refrigerator. Results, $F(1, 91)=5.95$, $p < .001$, revealed that nostalgia exerted a significant negative influence on purchase likelihood for the green refrigerator ($\beta=-.31$, $t(91)=-3.73$, $p < .001$), while age ($\beta=-.18$, $t(91)=-2.10$, $p < .05$) and attitudes toward the refrigerator ($\beta=.45$, $t(91)=4.21$, $p < .001$) also significantly influenced purchase likelihood for the green refrigerator. None of the other control variables was significant ($ps > .20$).

We then conducted the same analysis for the regular refrigerator. Results, $F(1, 91)=9.77$, $p < .001$, showed that nostalgia did not significantly affect purchase likelihood for the regular refrigerator ($\beta=-.01$, $t(91)=-0.10$, $p > .90$) while age ($\beta=-.19$, $t(91)=-2.46$, $p < .05$) and attitudes toward the refrigerator ($\beta=.51$, $t(91)=6.09$, $p < .001$) significantly influenced purchase likelihood for the regular refrigerator. None of the other control variables was significant ($ps > .20$). These results further supported H1.

Having established that nostalgia lowered preference for green (vs regular) products in Studies 1a and 1b (for both low- and high-involvement products), we next turn to examining the process underlying this effect. We conducted Study 2 to test the mediating effect of past orientation in the relationship between nostalgia and green consumption.

Study 2: the mediating role of past orientation

The objectives of Study 2 were two-fold: (1) to test the mediating effect of past orientation in the relationship between nostalgia and green consumption (H2) and (2) to generalize our findings using a new product context.

Method. We recruited 172 participants via Amazon's MTurk (36.2% females, $M_{age}=33.1$ years). They were randomly assigned to one of the four conditions in a 2 (nostalgia prime: present vs absent) \times 2 (product greenness: green vs regular) between-subjects design. For the nostalgia condition, 40 and 41 participants were in the green versus regular product conditions, respectively. For the control condition, 43 and 48 participants were in the green versus regular product conditions, respectively. They first finished the same nostalgia priming task as in Study 1b. As there is no specific scale measuring past orientation in the literature, we reverse-scored participants' responses to four future orientation items from the Zimbardo Time Perspective Inventory ($\alpha=.72$; Appendix 2). This scale has been extensively used by prior researchers (e.g., Crockett et al., 2009; D'Alessio et al., 2003).

Following that, participants read the following scenario: "You have run out of hair shampoo, and need to buy more shampoo. You go to a supermarket and find the following new shampoo." The product stimuli were hair shampoo with the words "biodegradable ingredients" in the green product condition and "for a great hair day" in the regular product condition.

Other measures, including nostalgia manipulation check items and the control variables, were the same as those used in Study 1b. In addition, we asked participants to indicate the extent to which they were familiar with the new shampoo on a 7-point Likert-type scale (1 = *not at all familiar*, 7 = *very familiar*). As prior research suggests that nostalgia may also generate empathy and distress (Zhou et al., 2012), as well as influence self-esteem (Wildschut et al., 2006) and perceived social support (Zhou et al., 2008), we included these constructs as possible rival mediators in the analysis. In addition, as personal conservation behavior may also be affected by nostalgia as it elicits the tendency to look back, we also included this measure as a possible alternative mechanism (Milfont & Duckitt, 2010). The measurement items for all constructs are shown in Appendix 2.

Results and discussion. Participants in the nostalgia condition scored significantly higher on the index than did those in the control condition ($M_{nostalgia}=5.40$, $M_{control}=4.38$; $t(170)=-4.27$, $p < .001$). This suggested that our priming of nostalgia was successful. Participants rated the shampoo in the green condition as more green ($M_{green}=4.59$) than the shampoo in the regular condition ($M_{regular}=4.20$; $t(170)=-2.53$, $p < .05$).

We next conducted a 2 (product greenness) \times 2 (nostalgia manipulation) ANCOVA on purchase likelihood, taking into account all the control variables. The main effect nostalgia prime, $F(1, 157)=31.1$, $p < .001$, was significant. Those in the nostalgia condition reported a significantly lower purchase likelihood ($M=3.42$, $SD=1.52$) than those in the control condition ($M=5.04$, $SD=1.66$). Purchase likelihood for those in the green product condition ($M=4.50$, $SD=1.80$) did not differ from those in the regular product condition ($M=4.07$, $SD=1.76$, $p > .10$). More importantly, results yielded a significant interaction effect between product greenness and nostalgia manipulation on purchase likelihood, $F(1, 167)=11.45$, $p < .01$. Specifically, participants who initially had been primed with nostalgia reported a lower purchase likelihood for the green versus regular products ($M=3.21$, $SD=1.48$ vs $M=3.90$, $SD=1.43$, respectively; $t(79)=2.15$, $p < .05$; see Figure 3). This difference in purchase likelihood, however, did not emerge in the control condition ($M=4.11$, $SD=1.27$ vs $M=4.05$, $SD=1.10$, for the green vs regular product conditions, respectively; $p > .10$). Attitudes toward the refrigerator, $F(1, 157)=46.52$, $p < .001$, was also significant. Age, $F(1, 157)=3.88$, $p < .10$, was found

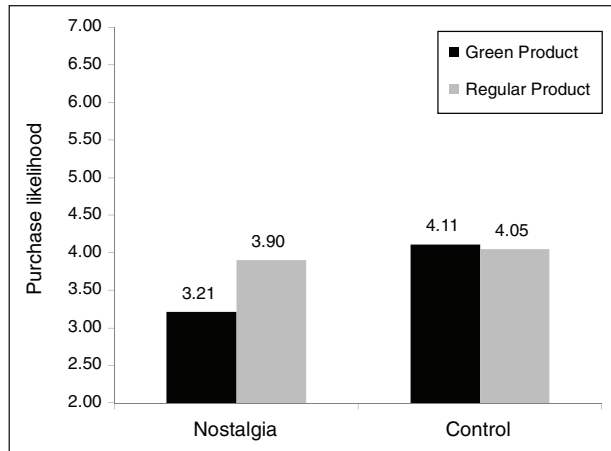


Figure 3. The moderating effect of product greenness (Study 2).

marginally significant. No other control variable was significant ($ps > .10$).

To further test the mediation role of past orientation between nostalgia and green consumption at different levels of the moderator, we next conducted a further analysis using bootstrapping tests (Model 4; Hayes, 2013) for the green and regular products separately. In our analysis, the nostalgia condition was coded as 1 and the control condition was coded as 0. For the green product, bootstrapping results indicated that the effect of nostalgia on purchase likelihood for the green shampoo was mediated by past orientation (effect size = .31, $SE = .17$, 95% $CI = [.06, .77]$). Multiple regression results, $F(1, 135) = 14.89$, $p < .001$, revealed that past orientation significantly influenced purchase likelihood for the green shampoo ($\beta = -.30$, $t(69) = -2.82$, $p < .01$) taking into account all the control variables. The negative direct effect of nostalgia on purchase likelihood for the green shampoo was also significant ($\beta = -.49$, $t(69) = -5.24$, $p < .001$) suggesting a complementary mediation (Zhao et al., 2010). For the regular shampoo, results showed that past orientation did not mediate the effect of nostalgia on purchase likelihood (effect size = .02, $SE = .05$, 95% $CI = [-.04, .21]$). Therefore, H2 was supported. These results were consistent with those of Studies 1a and 1b, thus offering further evidence that nostalgia decreased green consumption.

Following that, we also tested for the potential mediating roles of empathy, distress, positive affect (PA), negative affect (NA), self-esteem, perceived social support, and personal conservation behavior for the green and regular products separately. For the green shampoo, mediation test results showed that empathy (effect size = .10, $SE = .09$, 95% $CI = [-.002, .40]$), distress (effect size = $-.03$, $SE = .07$, 95% $CI = [-.26, .06]$), PA (effect size = .00, $SE = .05$, 95% $CI = [-.11, .11]$), NA (effect size = $-.05$, $SE = .07$, 95% $CI = [-.27, .02]$), self-esteem (effect size = $-.01$, $SE = .06$, 95% $CI = [-.18, .10]$), perceived social support (effect size = $-.04$,

$SE = .07$, 95% $CI = [-.33, .03]$), and personal conservation behavior (effect size = $-.05$, $SE = .09$, 95% $CI = [.42, .04]$) did not mediate the relationship between nostalgia and green consumption.

Similarly, for the regular shampoo, we found the same pattern in that empathy (effect size = .01, $SE = .04$, 95% $CI = [-.04, .13]$), distress (effect size = $-.007$, $SE = .06$, 95% $CI = [-.16, .05]$), PA (effect size = $-.001$, $SE = .04$, 95% $CI = [-.10, .07]$), NA (effect size = $-.01$, $SE = .06$, 95% $CI = [-.17, .09]$), self-esteem (effect size = $-.003$, $SE = .05$, 95% $CI = [-.18, .07]$), perceived social support (effect size = $-.03$, $SE = .04$, 95% $CI = [-.18, .02]$), and personal conservation behavior (effect size = .001, $SE = .05$, 95% $CI = [-.09, .11]$) did not mediate the relationship between nostalgia and purchase likelihood.

Taken together, consistent with Studies 1a and 1b, we found that nostalgia decreased purchase likelihood for the green (vs regular) product, as predicted by H1. More importantly, Study 2 offered evidence that past orientation mediated the relationship between nostalgia and green consumption, supporting H2. That is, nostalgia worked through past orientation to negatively influence green consumption. If consumers were primed with future orientation, the negative effects of nostalgia on green consumption would be reversed.

Study 3: the moderating role of MS

Study 3 sought to examine the moderating role of MS on the effect of nostalgia on green consumption. We propose that high (vs low) MS will enhance (vs mitigate) the negative effect of nostalgia on green consumption (H3).

Method. Study 3 used a 2 (MS: high vs low) \times 2 (nostalgia: nostalgia vs control) \times 2 (product greenness: green vs regular) between-participants design. Participants were randomly assigned to one of the eight conditions. We recruited 179 participants on Amazon's MTurk (34.6% females; $M_{age} = 43.9$ years). For the nostalgia condition, 23 and 18 participants were in the green versus regular product conditions, respectively, when primed with low MS; 23 and 15 participants were in the regular versus green product conditions, respectively, when primed with high MS. For the control condition, 27 and 22 participants were in the green versus regular product conditions, respectively, when primed with low MS; 27 and 24 participants were in the regular versus green product conditions, respectively, when primed with high MS. Nostalgia was manipulated using the same procedure as in Study 1b. The procedure and measures were similar to those in Study 2 with the following exceptions. To manipulate MS, we adopted the procedure by Rosenblatt et al. (1989), which has been used in other contexts (e.g., Mandel & Smeesters, 2008). Specifically, in the high MS condition, instructions to the participants were as follows: (1) please briefly describe the

emotions that the thought of your own death arouses in you and (2) jot down, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead. Each question was given on a separate page.

In contrast, instructions to the participants in the low MS condition were as follows: (1) please briefly describe the emotions that the thought of visiting the dentist arouses in you and (2) jot down, as specifically as you can, what you think will happen to you the next time you have a painful procedure done at the dentist's office (Mandel & Smeesters, 2008; Rosenblatt et al., 1989).

Participants then rated the PANAS scale, followed by several filler questions. An explicit death reminder may initially cause participants to remove such thoughts from their immediate consciousness, thus the purpose of the filler questions was to allow the MS activation to spread and take effect (Arndt et al., 2004; Greenberg et al., 1994). We used Templer's (1970) 15-item death anxiety scale as a manipulation check for MS (1 = *strongly disagree* to 7 = *strongly agree*; $\alpha = .87$). Subsequently, they responded to the time orientation measure.

The scenario instructed participants to imagine that "You have run out of copy paper at home, and you need to buy a new box of copy paper; you go to a store and find the following new copy paper." The product stimulus was a box of copy paper with "paper from sustainably farmed trees" in the green product condition and "multipurpose copy paper" in the regular product condition. Other measures were the same as in Study 2 (Appendix 2).

Results and discussion. In line with the terror management literature (Greenberg et al., 1997; Mandel & Smeesters, 2008), participants' PA and NA as measured by PANAS did not significantly differ as a result of the MS manipulation (NA: $M_{\text{high MS}} = 2.62$, $M_{\text{low MS}} = 2.63$, $t(177) = 0.05$, $p > .90$; PA: $M_{\text{high MS}} = 4.74$, $M_{\text{low MS}} = 4.41$, $t(177) = 1.54$, $p > .10$). Therefore, our results could not be explained by either PA or NA arising from MS manipulations.

Due to the high correlation in participants' responses to the 15 manipulation check items for MS, they were averaged to form a composite index. Participants in the high MS condition reported a significantly higher score ($M_{\text{high MS}} = 4.46$) on the index than did those in the control condition ($M_{\text{low MS}} = 4.11$, $t(177) = -2.12$, $p < .05$). In addition, participants rated the box of copy paper in the green condition to be more green ($M_{\text{green}} = 4.68$) than that in the regular condition ($M_{\text{regular}} = 4.27$; $t(177) = -2.72$, $p < .01$).

We next conducted a 2 (product greenness) \times 2 (nostalgia priming) \times 2 (time orientation manipulation) ANCOVA on purchase likelihood, taking into account all the control variables. Results yielded a marginally significant three-way interaction effect product greenness, MS, and nostalgia manipulation on purchase likelihood, $F(1, 161) = 2.79$, $p < .10$. Specifically, the interaction effect between nostalgia

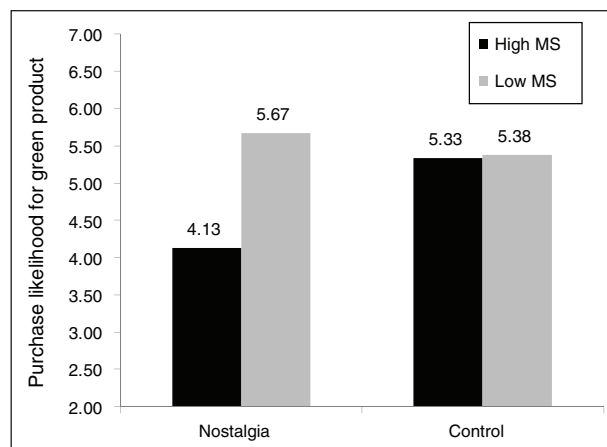


Figure 4. The moderating effect of mortality salience.

manipulation and MS was significant for the green product, $F(1, 75) = 10.22$, $p < .01$, while this pattern did not emerge for the regular product, $F(1, 76) = 1.93$, $p > .10$. Involvement, $F(1, 161) = 4.40$, $p < .05$, was also significant. No other control variable was significant ($ps > .10$).

To further dig into this effect, we conducted general linear model (GLM) analysis for the green and regular copy papers separately. For the green copy paper, results revealed a significant interaction effect between nostalgia and MS to predict purchase likelihood, $F(1, 74) = 6.55$, $p < .05$ (see Figure 4), taking into account all the control variables. In contrast, for the regular copy paper, the interaction effect between nostalgia and MS on purchase likelihood was not significant, $F(1, 75) = 0.53$, $p > .40$. Thus, H3 was supported. Drilling down, for the green copy paper, in line with our predictions, we found that nostalgic participants showed higher purchase likelihood when MS was low rather than high ($M_{\text{high MS}} = 4.13$, $M_{\text{low MS}} = 5.67$, $t(36) = 3.89$, $p < .001$). These results supported H3.

General discussion

Theoretical contributions

We conducted four studies to examine whether and how nostalgia affects consumer preference for green products. We examined the mediating role of past orientation underlying this effect and the boundary condition of MS. Specifically, in Studies 1a (chronic nostalgia) and 1b (primed nostalgia), we found that nostalgia lowered preference for green consumption. Study 2 demonstrated that this effect was mediated by past orientation. Finally, Study 3 examined the moderating role of MS in the relationship between nostalgia and green consumption. We found that when MS was high (vs low), the negative effect of nostalgia on green consumption was enhanced (vs mitigated).

Our findings make several important theoretical contributions. First, while prior behavioral studies examined the

impact of nostalgia in various consumption contexts (Holak & Havlena, 1998; Holbrook and Schindler, 1989, 1994; Schindler & Holbrook, 2003; Zhou et al., 2012), to our knowledge, the present research is the first behavioral examination of how nostalgia influences consumers' preference for green versus regular products.

Second, we add to the literature on how and why people choose green versus regular products. Prior research has found various factors that influence green consumption, including lay theories that consumers hold toward green products (Luchs et al., 2010), the mere presence of green products (Mazar & Zhong, 2010), making detailed and action-oriented commitment toward green consumption (Baca-Motes et al., 2013), social norms (Goldstein et al., 2008), and how one's product consideration is structured (Irwin & Naylor, 2009). The present research finds that nostalgia lowers preference for green consumption. Moreover, we provide robust evidence that the above relationship is mediated by consumers' past orientation. Specifically, nostalgia would elicit a great extent of past orientation, leading to low preference toward green consumption.

In addition, we also identify the boundary condition when this effect is mitigated, that is, MS. When MS was high (vs low), the negative effect of nostalgia on green consumption would be enhanced (vs mitigated). This is because in the high MS condition, participants are aware of their impending death, which leads them to be more concerned about enjoying their remaining days and less concerned about sustainability. In contrast, for those in the low MS condition (e.g., seeing a dentist), participants' desire to overcome their temporarily painful episode which implies a future-based outlook, leading them to care more about sustainability and thus engage in more green consumption.

Managerial implications

Beyond the theoretical contributions, our findings also have significant implications for public policy and practitioners. In particular, while nostalgia tends to be viewed as an individual-level sentiment, there exists the concept of collective nostalgia (Wildschut et al., 2014). As conceptualized by Baker and Kennedy (1994):

a sentimental or bittersweet yearning for the past which represents a culture, a generation, or a nation may be called collective nostalgia. This is not an individualistic notion, rather, it is a collectivistic notion which makes the emotion more consistent between individuals of a similar background when it is presented in the same context.

In this vein, it may be possible to have an intervention by the government agencies to lower the level of collective nostalgia to stimulate people's desire for green consumption, as nostalgia decreases preference for green products. For example, in the public service advertisements with

regard to environmentalism, themes should focus on the future instead of dwelling on the past. Furthermore, it is important to avoid allusions to one's mortality, which can lower propensity for green consumption. Taken together, such public service announcement campaigns promoting greater sustainability or environmentalism should be future-oriented and emphasize youthfulness and vitality. Similarly, companies manufacturing green products should also adopt similar strategies when communicating with their target customers.

Limitations and future research

Limitations in the present research offer opportunities for the future research. While we found support for past orientation as the mechanism underlying the effects of nostalgia on green consumption, there could exist other mediation processes. In particular, in Study 2, we found complementary mediation of past orientation between nostalgia and green consumption. This suggests the possibility of other omitted mediators (Zhao et al., 2010). For example, social norms could influence one's green consumption behavior (Goldstein et al., 2008). It has previously been shown that eliciting nostalgia could bolster social connectedness (Wildschut et al., 2010); thus, potentially the opinions of close friends and family members on green consumption could affect one's green behavior. Thus, the mediating role of social connectedness warrants further research. In addition, there may also be other important factors that we did not control as confounds in our analyses. Future research should examine the factors that influence green consumption thoroughly.

Second, this research focuses on green products characterized with sustainability and future orientation (Dangelico & Pujari, 2010), no matter they are from old or from young brands. We believe nostalgia should lead to less green consumption for all green products in all different categories though we investigated the focal relationship only in the product categories of batteries, refrigerators, copy paper, and shampoo, limiting the generalizability to other product categories such as foods. Future research should examine whether the relationship will change in other product categories to enhance generalizability.

Third, Lee et al. (2014) find that when exposed to green product messages, green (vs non-green) consumers tend to have a high (vs low) level of frontal theta activations while when processing price information, the difference disappeared. It is desirable to examine the effect of the content of contextual information on green consumption in the future research. Furthermore, it is noteworthy that visual attention, which is driven by various factors, may not be associated with subjective and declarative valuations (e.g., Balcombe et al., 2017; Orquin & Loose, 2013). Future research should also consider such effect in the focal relationship. In addition, it should be interesting to combine

the use of traditional techniques, such as surveys and experiments and neurophysiological tools to support a more holistic understanding of consumer behavior and, therefore, would provide more accurate and useful insights to define the best way to investigate how nostalgia affects green consumption.

Fourth, the effect of nostalgia on green consumption may differ across people depending on their social identities and values. For example, Grinstein and Nisan (2009) find that in response to a government pro-environmental demarketing campaign, minority groups engage in consumption or deconsumption to show their social identity and beliefs. Haws et al. (2014) also find that green consumption values can influence green consumption behavior. Therefore, it is possible that nostalgia would have differential effects on green consumption depending on one's social identities and values. Environmental concern and green product quality may be two other potential moderators. Consumers with a high level of environmental concern tend to engage in more green consumption than those with a low level of environmental concern (Lin & Huang, 2012). If consumers perceive the green products to be of high quality, then their purchase likelihood tends to be high (Lockie et al., 2004). These questions merit further investigation.

Finally, we recruited Amazon MTurk participants for all the studies. Future research should investigate whether online samples show differences in attitudes and behavior with through field studies (Hulland & Miller, 2018).

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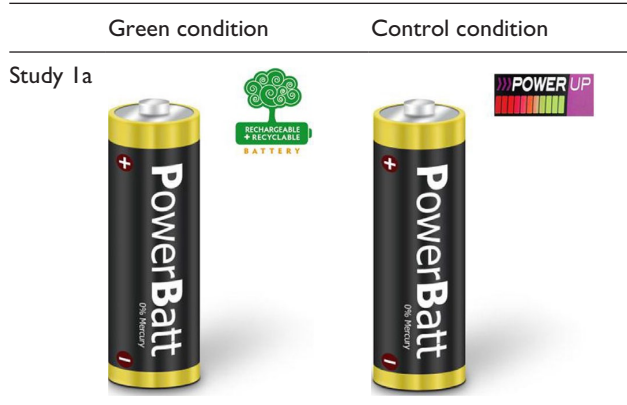
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Appendix I. Sample stimuli.



(Continued)

Appendix I. (Continued)



(Continued)

Appendix 1. (Continued)**Appendix 2.** Constructs and measurement items.**Nostalgia** (Study 1; Routledge et al., 2008)

- How often do you experience nostalgia?^a
- How prone are you to feeling nostalgic?^b
- Generally speaking, how often do you bring to mind nostalgic experiences?^a
- Specifically, how often do you bring to mind nostalgic experiences?^c
 - At least once a day
 - Three to four times a week
 - Approximately twice a week
 - Approximately once a week
 - Once or twice a month
 - Once every couple of months
 - Once or twice a year
- How important is it for you to bring to mind nostalgic experiences?^b

Attitudes toward the product (Studies 1–3; adapted from Tormala and Petty, 2002)

- Unfavorable–favorable
- Bad–good
- Negative–positive

Extraversion (Studies 1–3^d; Francis et al., 1992)

- Are you a talkative person?
- Are you rather lively?
- Do you enjoy meeting new people?
- Can you usually let yourself go and enjoy yourself at a lively party?
- Do you usually take the initiative in making new friends?
- Can you easily get some life into a rather dull party?
- Do you tend to keep in the background on social occasions?^c
- Do you like mixing with people?
- Do you like plenty of bustle and excitement around you?

(Continued)

Appendix 2. (Continued)

- Are you mostly quiet when you are with other people?^c
- Do other people think of you as being very lively?
- Can you get a party going?

Future orientation (Study 2^e; Crockett et al., 2009)

- Thinking about the future is pleasant to me.
- When I want to achieve something I set goals and consider specific means of reaching those goals.
- Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play.
- It seems to me that my future plans are pretty well laid out.

PANAS (Studies 2 and 3^b; Watson et al., 1988)

Please indicate to what extent you feel this way right now, at the present moment:

- interested
- distressed
- excited
- upset
- strong
- guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- attentive
- Jittery
- active
- afraid

Empathy (Study 2^b; Zhou et al., 2012)

Please indicate the extent to which you feel the different emotional state at present:

- sympathetic
- compassionate
- softhearted
- tender

Distress (Study 2^b; Zhou et al., 2012)

Please indicate the extent to which you feel the different emotional state at present:

- distressed
- upset
- perturbed
- troubled

Perceived social support (Study 2^d; Zimet et al., 1988)

- There is a special person who is around when I am in need.
- There is a special person with whom I can share my joys and sorrows.
- My family really tries to help me.
- I get the emotional help and support I need from my family.
- I have a special person who is a real source of comfort to me.
- My friends really try to help me.

(Continued)

Appendix 2. (Continued)

7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and sorrows.
10. There is a special person in my life who cares about my feelings.
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

Self-esteem (Study 2^d; Rosenberg, 1979)

1. On the whole, I am satisfied with myself
2. At times I think I am no good at all^c
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.^c
6. I certainly feel useless at times.
7. I feel that I'm a person of worth, or at least on an equal plane with others.
8. I wish I could have more respect for myself.^c
9. All in all, I am inclined to think that I am a failure.
10. I take a positive attitude toward myself.

Personal conservation behavior (Study 2^d; Milfont & Duckitt, 2010)

1. I could not be bothered to save water or other natural resources.^c
2. I make sure that during the winter the heating system in my room is not switched on too high.^c
3. In my daily life I'm just not interested in trying to conserve water and/or power.^c
4. Whenever possible, I take a short shower in order to conserve water.
5. I always switch the light off when I don't need it on any more.
6. I drive whenever it suits me, even if it does pollute the atmosphere.^c
7. In my daily life I try to find ways to conserve water or power.

(Continued)

Appendix 2. (Continued)

8. I am NOT the kind of person who makes efforts to conserve natural resources.^c
9. Whenever possible, I try to save natural resources.
10. Even if public transportation was more efficient than it is, I would prefer to drive my car.^c

Mortality salience manipulation check items (Study 3^d; adapted from Templer, 1970)

1. I am very much afraid to die.
2. The thought of death seldom enters my mind.^c
3. It doesn't make me nervous when people talk about death.^c
4. I dread to think about having to have an operation.
5. I am not at all afraid to die.^c
6. I am not particularly afraid of getting cancer.^c
7. The thought of death never bothers me.^c
8. I am often distressed by the way time flies so very rapidly.
9. I fear dying a painful death.
10. The subject of life after death troubles me greatly.
11. I am really scared of having a heart attack.
12. I often think about how short life really is.
13. I shudder when I hear people talking about a World War III.
14. The sight of a dead body is horrifying to me.
15. I feel that the future holds nothing for me to fear.^c

Involvement (Studies 1–3; Kramer, 2007)

1. Not at all involved—very involved
2. Not at all interested—very interested
3. Putting no effort at all—putting a lot of effort

^aMeasured on a scale from 1 (*very rarely*) to 7 (*very frequently*).^bMeasured on a scale from 1 (*not at all*) to 7 (*extremely*).^cReverse-coded.^dMeasured on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).^eMeasured on a scale from 1 (*extremely uncharacteristic*) to 7 (*extremely characteristic*).

All other measures used 7-point scales. IV: Nostalgia; mediator: Future orientation; empathy, distress, positive affect, negative affect, self-esteem, perceived social support, and personal conservation behavior were possible parallel explanation process variables; other variables were control variables.