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Nostalgia Proneness and Empathy:  
Generality, Underlying Mechanism, and Implications for Prosocial Behavior

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## Abstract

**Objective:** Nostalgia is a sentimental longing for one's past. We examined the hypotheses (rooted in attachment theory and research) that nostalgia prone individuals, by virtue of their greater attachment security, are more empathic and enact more prosocial behavior. **Method:** In five studies, testing 1923 participants ( $N_{\text{range}} = 132\text{-}823$ , 52.42% women,  $\text{Age}_{\text{range}} = 8\text{-}90$  years), we measured nostalgia proneness and affective empathy. Additionally, we measured cognitive empathy in Study 3, attachment security in Studies 4-5, and prosocial behavior in Study 5. **Results:** Nostalgia proneness was positively related to affective empathy among younger and older adults (Studies 1, 3-5) and among children (Study 2). This association was stronger for affective empathy than cognitive empathy (Study 3). Also, attachment security mediated the relation between nostalgia proneness and affective empathy (Studies 4-5). Finally, nostalgia prone individuals were more likely to engage in prosocial behavior, and this relation was serially mediated by attachment security and affective empathy (Study 5). **Conclusion:** The findings establish the empathic and prosocial character of nostalgia prone individuals, and clarify their personality profile.

*Keywords:* empathy, nostalgia proneness, attachment theory, prosocial behavior, donating

Nostalgia is “a sentimental longing or wistful affection for the past” (The New Oxford Dictionary of English, 1998, p. 1266). Prototype analyses have indicated that laypersons across 18 countries conceptualize nostalgia as a predominantly positive and past-oriented emotion (Hepper, Ritchie, Sedikides, & Wildschut, 2012; Hepper et al., 2014). Narrative analyses have further revealed that, when nostalgic, individuals reflect fondly on events (e.g., vacations, anniversaries), close others (e.g., friends, grandparents), or time periods (e.g.,

childhood, college) from their past, often through rose-colored glasses (Batcho, 1995; Wildschut, Sedikides, Arndt, & Routledge, 2006). Yet, nostalgia is also associated with negative affectivity, particularly longing for an irredeemably lost past and accompanying sadness (Hepper et al., 2012; Wildschut, Sedikides, & Alowidy, 2019). Also, nostalgia is a social emotion; although the self is featured as the protagonist in nostalgic reflections, it is almost always embedded within a social context (Sedikides & Wildschut, 2019).

Experimental research has shown that nostalgia functions to regulate aversive states. For example, people become nostalgic in response to threats to meaning in life (Routledge et al., 2011) and physical coldness (Zhou, Wildschut, Sedikides, Chen, & Vingerhoets, 2012). Nostalgia, in turn, increases meaning (Routledge et al., 2011) and the sense of physical warmth (Zhou et al., 2012). Nostalgia similarly manages existential concerns about death (Routledge, Arndt, Sedikides, & Wildschut, 2008) and self-esteem threats (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012). Nostalgia's sociality function, though, has received the lion's share of empirical attention. People become nostalgic when they are lonely or experience belongingness deficits (Wildschut et al., 2006; Zhou, Sedikides, Wildschut, & Gao, 2008). Loneliness-induced nostalgia, in turn, predicts stronger perceptions of social support (Zhou et al., 2008). Also, experimentally-induced nostalgia fosters social connectedness. For example, nostalgia engenders feelings of being loved and protected (Hepper et al., 2012; Wildschut et al., 2006), and bolsters attachment security (decreased attachment avoidance and attachment anxiety; Wildschut et al., 2006). Moreover, nostalgia nurtures approach-oriented social behaviors (e.g., reduced social distancing; Stephan et al., 2014) and increases empathy as well as prosocial behavior (Zhou, Wildschut, Sedikides, Shi, & Feng, 2012). This evidence, however, pertains only to momentary (state-level) nostalgia (Sedikides et al., 2015). Much less research has focused on dispositional (trait-level) proneness to nostalgia. Consequently, it is unclear what it means to be a nostalgia prone

person. We aimed to shed light on this personality trait. We begin by documenting research on nostalgia proneness to date.

### **Nostalgia Proneness**

Nostalgia proneness refers to the propensity to nostalgize. Nostalgia prone individuals experience nostalgia relatively frequently and about more aspects of their past. Given that momentary nostalgia entails psychological benefits, it is plausible that nostalgia prone individuals experience these benefits. However, this is not yet clear from previous research. Some findings are consistent with this possibility. Nostalgic individuals, for example, are relatively proficient at managing existential concerns (Juhl, Routledge, Arndt, Sedikides, & Wildschut, 2010) and report greater psychological well-being (Baldwin, Biernat, & Landau, 2015). Yet, nostalgia proneness is positively linked to potentially detrimental characteristics. Nostalgia prone individuals report greater loneliness (Zhou et al., 2008), are more neurotic (Seehusen et al., 2013), and experience greater sadness (Barrett et al., 2010). Further, nostalgia proneness is positively associated with rumination and counterfactual thinking, which are negatively-toned modes of past-oriented thought, as well as with bitterness revival (using autobiographical memories to rekindle resentment toward others; Cheung, Wildschut, & Sedikides, 2018). A closer inspection of this work, however, suggests that (1) nostalgia proneness is positively correlated with these traits because nostalgia is a reaction to (rather than a cause of) aversive experiences, and (2) nostalgic individuals are more socially oriented than their less nostalgic counterparts. We explain below.

Regarding the positive relation between loneliness and nostalgia proneness, Zhou et al. (2008) also reported (1) a positive link between nostalgia proneness and social connectedness, and (2) a positive indirect effect from loneliness to stronger social support via nostalgia proneness. These findings parallel their experimental work, which showed that

induced loneliness increases state nostalgia, which in turn predicts stronger social support (Zhou et al., 2008). Lonely persons, thus, are likely more nostalgia prone because they recruit nostalgia to offset the negative impact of loneliness on perceived social support.

Regarding the relation between neuroticism and nostalgia proneness, neuroticism, in its original meaning of emotional instability (Hofstee, de Raad, & Goldberg, 1992), pertains to the degree to which one's emotions are contingent upon external and therefore fluctuating circumstances. On this basis, Seehusen et al. (2013) proposed that neuroticism should be positively related to the need to belong ("need for frequent, nonaversive interactions within ongoing relational bonds"; Baumeister & Leary, 1995, p. 497), because this need renders one vulnerable to fluctuations in social acceptance and rejection. Indeed, they found that the need to belong was linked to greater neuroticism. Also, the need to belong was positively related to nostalgia proneness, presumably because nostalgia's rich social content can meet belongingness needs. So, if the need to belong is positively related to both neuroticism and nostalgia proneness, the link between neuroticism and nostalgia proneness may be spurious (i.e., due to their shared association with a third variable: the need to belong). Indeed, when controlling for (partialling-out) the need to belong, the link between neuroticism and nostalgia proneness was eliminated. Moreover, the need to belong predicted nostalgia proneness, above and beyond neuroticism.

Finally, the positive relations of nostalgia proneness with rumination, counterfactual thinking, and bitterness revival can be interpreted in terms of nostalgia's sociality. Cheung et al. (2018) assessed individual differences in nostalgia proneness, rumination, and counterfactual thinking, which they linked to self-reported uses (functions) of autobiographical memory (Webster, 2003). Two relevant findings emerged—one general, one specific. The general finding was that persons with a stronger global propensity toward past-oriented thought (as manifested in positive correlations among nostalgia, rumination,

and counterfactual thinking) reported greater reliance on autobiographical memories to serve a wide range of functions, including bitterness revival (using autobiographical memories to rekindle resentment toward others) and intimacy maintenance (drawing on memories to achieve symbolic proximity to close others in lieu of their physical presence). The specific finding was that nostalgia proneness (relative to rumination and counterfactual thinking) had a strong positive relation with intimacy maintenance and a weak relation with bitterness revival. Thus, in a multivariate context, nostalgia proneness stood out as a distinctly more social trait than rumination or counterfactual thinking.

In each of the above-described cases, an apparently negative aspect of nostalgia proneness can, when considered in its wider, multivariate context, be reinterpreted in terms of nostalgia's sociality. A concern with this multivariate approach is that it involves the partialling of variables from one another (e.g., partialling rumination and counterfactual thinking from nostalgia proneness in predicting intimacy maintenance; Cheung et al., 2018). These analyses are informative, but contain pitfalls or "perils of partialling" (Lynam, Hoyle, & Newman, 2006, p. 328). One pitfall is ambiguity regarding the substantive interpretation of constructs once variance shared with other variables has been partialled-out. For example, one might question whether nostalgia proneness and neuroticism-free nostalgia proneness are the same construct (cf. Seehusen et al., 2013). In the present research, we aimed to lift this cloud of uncertainty over the sociality of nostalgia proneness by testing the pure association of nostalgia proneness with three quintessential aspects of human sociality: empathy (Eisenberg & Strayer, 1987), attachment security (Mikulincer & Shaver, 2011), and prosocial, charitable behavior (Batson, 2011).

## **Secure Attachment Mediates the Relation Between Nostalgia Proneness and Empathy**

Empathy is “the ability to understand and share the feelings of another” (The New Oxford Dictionary of English, 1998, p. 604). Our primary hypothesis was that nostalgia prone individuals are more empathic. The hypothesis was based on attachment theory, which posits that empathic concern is shaped by the interplay between the attachment and caregiving systems (Bowlby, 1969). Within the attachment system, attachment security develops when others are responsive to one’s needs. Attachment security entails positive perceptions of oneself as worthy of others’ attention and the expectation that others will be supportive in times of need. The caregiving system, on the other hand, is responsible for attending to others’ needs. It is activated by the presence of others in need and allows one to feel empathy for them (Mikulincer & Shaver, 2017, 2011). Empathy, in turn, motivates one to help others (Batson, 2011).

According to the theory, for the caregiving system to function well, one needs to have a sufficient level of attachment security (Bowlby, 1969; Mikulincer et al., 2001). That is, for an individual to possess the capacity to empathically turn their attention to others’ needs, they should feel that their own attachment needs are being met. As Mikulincer and colleagues (2005) stated, “Only a relatively secure person can easily perceive others not only as sources of security and support, but also as suffering human beings who have important needs and therefore deserve support” (p. 818). Consistent with the theory, trait levels of attachment security (low attachment avoidance and low attachment anxiety) are associated with greater empathy, and experimentally priming attachment security increases empathy (Mikulincer et al., 2001).

Given that momentary nostalgia fosters attachment security (Wildschut et al., 2006) and empathy (Zhou et al., 2012), it stands to reason that nostalgia prone individuals may exhibit stronger attachment security and thus experience more empathy. Specifically,

nostalgia prone individuals, by definition, feel momentary nostalgia more frequently. As such, they may experience more frequent boosts to attachment security. Attachment styles can change across time in adulthood (Mikulincer & Shaver, 2017). As such, nostalgia proneness could be implicated in greater attachment security and thus greater empathy. Accordingly, we examined, for the first time, whether (1) nostalgia prone individuals are more empathic, and (2) this link is mediated by attachment security.

The literature distinguishes between two subtypes of empathy, affective and cognitive (Davis, 1983; Strayer, 1987). Affective empathy refers to emotional responses to others, including experiencing others' emotions. Cognitive empathy refers to understanding others' perspective. Empathy, as measured in nostalgia (Zhou et al., 2012) and attachment (Mikulincer et al., 2001) research, is best conceptualized as affective empathy. Thus, our hypothesis that nostalgia proneness is associated with empathy, is particularly pertinent to affective empathy. Consequently, we primarily focused on affective empathy in the present investigation.

### **Empathy Mediates the Relation Between Nostalgia Proneness and Prosocial Behavior**

Empathy promotes prosocial behaviors, such as donating (Cohen & Hoffner, 2013), volunteering (Pavey, Greitemeyer, & Sparks, 2012), and sharing (Edele, Dziobek, & Keller, 2013). If nostalgia prone individuals are more empathic, they may also be more prosocial. Indeed, momentary nostalgia increases prosocial behavior by virtue of its capacity to foster empathy (Zhou et al., 2012). However, no work has tested whether nostalgia prone individuals engage in more prosocial, charitable behavior. We addressed this issue in our final study.



## Overview

We conducted five studies to test our hypothesis that nostalgia prone individuals are more empathic. In Study 1, we drew upon existing survey data from a representative sample of the Dutch population to find out whether nostalgia proneness is associated with affective empathy. We further capitalized on this sample to examine whether this association manifests above and beyond core (Big Five) personality characteristics and whether it generalizes across key demographic variables. In Study 2, we put the generality of this association to another test by inspecting the link between nostalgia proneness and affective empathy among young children. In Study 3, we examined the relation between nostalgia and both affective and cognitive empathy. In Studies 4-5, we tested if nostalgia proneness is associated with attachment security and if attachment security helps explain the relation between nostalgia proneness and affective empathy—a relation observed in Studies 1-3. Finally, in Study 5, we addressed whether nostalgia proneness is linked with increased prosocial behavior via its relation with affective empathy.

### Study 1: Nostalgia Proneness and Affective Empathy

For an initial test of the nostalgia proneness-empathy link, we drew upon existing survey data available from the Longitudinal Internet Studies for the Social Sciences (LISS) panel. Participants completed measures of nostalgia proneness, affective empathy, and the Big Five traits. These data, then, gave us the opportunity to examine the relation between nostalgia proneness and affective empathy, as well as the opportunity to test whether this relation is observed above and beyond core personality traits. Moreover, the LISS panel consists of a representative sample of the Dutch population and includes key demographic variables, such as household income and level of education. This allowed us to explore whether the relation between nostalgia proneness and affective empathy varies across different demographic profiles.

## Method

**Data collection.** The LISS panel ([www.surveeydata.nl/liss-panel-data-archive](http://www.surveeydata.nl/liss-panel-data-archive)) comprises household members selected based on a true probability sampling of households registered with Statistics Netherlands. Panel members complete studies each month, and their responses can be merged across studies. Data collection is managed by CentERdata in Tilburg, The Netherlands.

We assembled the dataset for Study 1 from four LISS studies. “Background Variables” (completed February, 2011) contained demographic measures. “Nostalgia” (completed March, 2013) contained measures of nostalgia proneness. “Self-Regulatory Orientation: Addressing a Basic Aspect of The Self and Its Relation to Social Indicators and Life-Outcomes” (completed February, 2011) contained a measure of affective empathy. Wave 4 of “Personality” (completed May, 2011) contained a measure of the Big Five traits. “Personality” is administered once annually. Several waves of data were available. We used Wave 4 to obtain the Big Five measures, because it was administered most proximally to the study that contained the affective empathy measure (“Self-Regulatory Orientation...”). Data for the “Background Variables” study are updated monthly; we used the data collected in the same month as the data for the study containing the affective empathy measure.

**Participants.** Eight hundred twenty-three participants completed measures of nostalgia proneness, empathy, and Big Five traits as well as demographic questions concerning gender, age, gross household income (GHI; in Euros), education level, and relationship status (441 women, 382 men;  $M_{\text{age}} = 52.05$  years,  $SD_{\text{age}} = 16.92$  years,  $\text{Range}_{\text{age}} = 16\text{-}90$  years;  $M_{\text{monthly GHI}} = \text{€}4117.06$ ,  $SD_{\text{monthly GHI}} = \text{€}3624.13$ ,  $\text{Range}_{\text{monthly GHI}} = \text{€}0\text{-}63792$ ).<sup>1</sup> Education level varied considerably. Of participants: 0.2% had not yet started any education (coded as 1), 1% had not completed any education (coded as 2), 6.4% had elementary school as their highest level of education (coded as 3), 25.8% had junior high school (coded as 4),

10.3% had high school (coded as 5), 22.6% had intermediate vocational education (coded as 6), 23.2% had higher vocational education (coded as 7), 7.9% had university (coded as 8), and 2.6% had other (coded as missing). In terms of relationship status, 60.1% were married, 0.7% separated, 10.7% divorced, 6.3% widowed, and 22.1% never been married.

**Nostalgia proneness.** Participants completed the Southampton Nostalgia Scale (SNS; Barrett et al., 2010; Routledge et al., 2008) and the Nostalgia Inventory (NI; Batcho, 1998). For the SNS, they responded to seven items (e.g., “How prone are you to feeling nostalgic;” 1 = *not at all*, 7 = *very much*). We averaged responses to compute SNS scores ( $\alpha = .95$ ;  $M = 3.97$ ,  $SD = 1.26$ ). For the NI, participants indicated nostalgia (1 = *not at all nostalgic*, 6 = *very nostalgic*) felt about 20 objects (e.g., “friends,” “my pets,” “holidays I went on”). We averaged responses to compute NI scores ( $\alpha = .93$ ;  $M = 3.73$ ,  $SD = 1.09$ ). By using two nostalgia proneness measures, we adopted the logic of multiple convergent operations (truth is approximated via multiple operational definitions and a strategy of multiple triangulation), thus seeking to avoid the pitfalls of mono-operationism (Campbell & Fiske, 1959; Cook & Campbell, 1979). Prior research has shown that the SNS and NI are positively correlated in US ( $r[36] = .40$ ,  $p < .01$ ; Routledge et al., 2008) and Chinese ( $r[191] = .41$ ,  $p < .001$ ; Zhou et al., 2008) samples. Here, they were also positively and substantially correlated,  $r(821) = .64$ ,  $p < .001$ . Thus, as in prior research (Zhou et al., 2008; Stephan et al., 2014), we standardized ( $z$  scored) responses to each scale to create a shared metric and then averaged them to form a composite nostalgia proneness score for each participant ( $\alpha = .96$ ).<sup>2</sup> We report separate analyses for each scales in Supplementary Materials.

**Affective empathy.** Participants responded to eight items (e.g., “Seeing people cry upsets me”) from Mehrabian and Epstein’s (1972) affective empathy scale.<sup>3</sup> They rated the extent to which each item applied to them (1 = *totally not applicable*, 7 = *totally applicable*).

We averaged responses to create affective empathy scores ( $\alpha = .87$ ; see Table 1 for descriptive statistics).

**Big Five traits.** Participants completed the Big Five personality assessment from the International Personality Item Pool (Goldberg et al., 2006). This scale consists of five factors, 10 statements each, that assess Neuroticism (e.g., “Get upset easily”;  $\alpha = .88$ ), Extraversion (e.g., “Feel comfortable around people”;  $\alpha = .78$ ), Agreeableness (e.g., “Take time out for others”;  $\alpha = .82$ ), Conscientiousness (e.g., “Am always prepared”;  $\alpha = .78$ ), and Openness to Experience (e.g., “Have a vivid imagination”;  $\alpha = .76$ ). Participants indicated how accurately each statement described them (1 = *very inaccurate*, 5 = *very accurate*). Each subscale formed a reliable index, and thus, after reverse-scoring the appropriate items, we averaged respective responses to calculate subscale scores (see Table 1 for descriptive statistics).

## Results and Discussion

**Zero-order correlations.** We computed correlation coefficients between nostalgia proneness and affective empathy as well as the Big Five traits (Table 1). Nostalgia proneness was significantly and positively associated with affective empathy. This is evidence for a direct, unambiguous association between nostalgia proneness and sociality.

**Correlations after controlling for personality, gender, and age.** Affective empathy was also significantly associated with Big Five traits (Neuroticism, Agreeableness, Conscientiousness), gender, and age. To test whether nostalgia proneness predicts affective empathy above and beyond these variables, we conducted a hierarchical regression analysis (Table 2). In the first step, we entered gender and age as predictors of affective empathy. In the second step, we entered the Big Five traits. In the third step, we entered nostalgia proneness. In the first step, gender and age were significant predictors of affective empathy. In the second step, age, Neuroticism, and Agreeableness were significant predictors of affective empathy; gender was a marginal predictor. In the third step, nostalgia proneness

predicted affective empathy, with Neuroticism, Agreeableness, gender, and age remaining significant predictors. In short, nostalgia proneness predicted affective empathy above and beyond gender, age, and core personality traits.

**Tests for moderation by demographic variables.** To find out if the relation between nostalgia proneness and affective empathy varied across individuals with different demographic profiles, we conducted moderation analyses. Specifically, to test whether categorical demographics (gender, relationship status) moderated the association between nostalgia proneness and affective empathy, we conducted an Analysis of Covariance for each of these variables. For each analysis, we entered the categorical demographic, nostalgia proneness, and the Demographic  $\times$  Nostalgia Proneness interaction as predictors of affective empathy. Neither gender,  $F(1, 819) = 1.46, p = .228$ , nor relationships status,  $F(4, 813) = 1.86, p = .115$ , moderated the association between nostalgia proneness and empathy.

To test whether continuous demographics (age, household income, level of education) moderated nostalgia proneness's capacity to predict affective empathy, we carried out a hierarchical regression analysis for each of these variables. For each analysis, we entered the continuous demographic and nostalgia proneness in the first step, and their interaction in the second step, as predictors of affective empathy. Neither age,  $t(819) = 1.26, p = .208$ , household income,  $t(768) = -0.66, p = .509$ , nor education level,  $t(798) = 0.22, p = .829$ , moderated the relation between nostalgia proneness and affective empathy.<sup>4</sup>

**Summary.** In a representative Dutch sample, nostalgia prone individuals manifested greater affective empathy, providing evidence for a direct relation between nostalgia proneness and sociality. Further, the association between nostalgia proneness and affective empathy remained significant after controlling for gender, age, and the Big Five traits. Key demographic variables, such as education level and household income, did not moderate the relation between nostalgia proneness and affective empathy, providing additional evidence

for the generality of this relation. Nostalgia proneness also showed notable associations with Neuroticism and Agreeableness. The association with Neuroticism is consistent with the literature (Barrett et al., 2010; Seehusen et al., 2013; Stephan et al., 2014). The present study, however, is the first to demonstrate that nostalgia proneness is positively associated with Agreeableness. We expand upon the implications of this finding in the General Discussion.

### **Study 2: Nostalgia Proneness and Affective Empathy in Children**

Having established that nostalgia proneness and affective empathy are positively linked among adults of a wide age range in Study 1, we next tested this link in a specific age group excluded from the LISS sample: young children. To do so, we administered versions of the SNS and affective empathy scales used in Study 1 that were adapted for children.

Although children do not have as many memories upon which they can nostalgically reflect, they do report feeling nostalgic (Batcho, 1995; Zhou et al., 2008), and nostalgia appears to function similarly in children as in adults (Zhou et al., 2008).

### **Method**

**Participants and procedure.** One hundred and thirty-two children (74 girls, 58 boys) from three Southampton elementary schools completed the study ( $M_{\text{age}} = 9.42$  years,  $SD_{\text{age}} = 0.47$  years,  $\text{Range}_{\text{age}} = 8\text{-}10$  years). We obtained each child's birthdate, but were unable to match this information with the children's questionnaire responses due to a confidentiality agreement with the participating schools. The children were in Year 5 ( $n = 108$ ) or Year 6 ( $n = 24$ ) of elementary school. This year-group information served as a proxy for age.

We administered all materials to children in their classrooms and in groups of 5-7. This enabled the research assistant (RA) to check that children responded to each item and completed the scales independently. Prior to scale completion, the RA gave participants

instructions on how to use a rating scale and the opportunity to familiarize themselves with it via practice questions. The RA read all the instructions and each question aloud, while participants followed along in their own questionnaire booklet and responded to the questions.

**Nostalgia proneness.** We adapted the SNS (used in Study 1) to measure nostalgia proneness in children (SNS-C; see Supplementary Materials for the entire scale, instructions, and further psychometric information). To ensure that participants knew and understood the concept of nostalgia, we informed them that “Nostalgia is a feeling that children can have when they think about things that happened when they were younger.” Next, we presented them with two vignettes, both of which gave an example of a child engaging in nostalgic reflection. These vignettes contained central prototypical features of nostalgia (memory, happiness, wanting to return to the past, social relationships; Hepper et al., 2012). Each vignette was accompanied by a cartoon drawing depicting the child engaged in nostalgia. Similar vignettes have been used in research with adults (Hepper et al., 2012). Participants then responded to seven items (e.g., “How often do you feel nostalgia when you think about things that happened when you were younger?”; 1 = *not at all*, 7 = *very much*) that were based on the original seven SNS items. We simplified the language and vocabulary to ensure that children would understand. We averaged responses to create nostalgia proneness scores ( $\alpha = .87$ ; see Table 3 for descriptive statistics).

**Affective empathy.** We measure affective empathy with the Index of Empathy for Children and Adolescents (Bryant, 1982), which is based on Mehrabian and Epstein’s (1972) affective empathy scale (used in Study 1) and is tailored for children and adolescents. Participants indicated the extent to which they agreed (1 = *strongly disagree*, 7 = *strongly agree*) with 22 statements (e.g., “It makes me sad to see a girl who can't find anyone to play

with”). After reverse-scoring appropriate items, we averaged responses to create affective empathy scores ( $\alpha = .62$ ; see Table 3 for descriptive statistics).<sup>5</sup>

## Results and Discussion

We computed correlation coefficients between nostalgia proneness, affective empathy, gender, and year (Table 3). Nostalgia proneness was positively related to affective empathy. Also, affective empathy was associated with gender and year. Specifically, girls had higher affective empathy than boys, and Year 6 students had higher affective empathy than Year 5 students. However, the association between nostalgia proneness and affective empathy remained significant when controlling for gender and year,  $b = 0.15$ ,  $SE = .04$ ,  $t(128) = 3.35$ ,  $p = .001$ .

**Summary.** Study 2 built upon Study 1 by demonstrating that, as with nostalgic adults, nostalgic children experience greater affective empathy. The findings replicated the theoretically-grounded findings among adults, lending support to the construct validity of the SNS-C (Cronbach & Meehl, 1955).

### Study 3: Nostalgia Proneness and Affective and Cognitive Empathy

In Study 3, we set two goals: (1) test the conceptual replicability of the association between nostalgia proneness and affective empathy that we obtained in the first two studies, and (2) find out whether nostalgia proneness is also associated with cognitive empathy.

## Method

**Participants and procedure.** Five hundred and nineteen individuals (284 women, 235 men;  $M_{\text{age}} = 45.60$  years,  $SD_{\text{age}} = 11.32$  years,  $\text{Range}_{\text{age}} = 13\text{-}71$  years) completed the study on a website hosted by Tilburg University. They did so after visiting the website for “Top 2000,” a popular Dutch radio program that is aired annually toward the end of the



calendar year. The “Top 2000” website displayed an invitation to participate in research, and interested visitors could navigate to Tilburg University’s website containing the study materials.

**Nostalgia proneness.** Participants completed the SNS ( $\alpha = .92$ ,  $M = 4.67$ ,  $SD = 1.39$ ) and NI ( $\alpha = .90$ ,  $M = 4.37$ ,  $SD = 1.02$ ) described in Study 1. As before, we standardized and averaged these scales to create composite nostalgia proneness scores ( $\alpha = .94$ ).

**Empathy.** Participants completed the Basic Empathy Scale (BES; Jolliffe & Farrington, 2006a) by responding (1 = *disagree strongly*, 4 = *agree strongly*) to 20 statements. Eleven items assessed affective empathy (e.g., “After being with a friend who is sad about something, I usually feel sad”;  $\alpha = .74$ ) and nine items assessed cognitive empathy (e.g., “When someone is feeling ‘down’ I can usually understand how they feel”;  $\alpha = .74$ ).

After reverse-scoring the appropriate items, we averaged respective responses to create overall affective empathy and cognitive empathy scores (see Table 4 for descriptive statistics).

## Results and Discussion

**Zero-order correlations.** We computed correlation coefficients between nostalgia proneness and both affective and cognitive empathy (Table 4). Nostalgia proneness was significantly and positively related to affective empathy, and was marginally and positively related to cognitive empathy. The correlation between nostalgia proneness and affective empathy was significantly stronger than the correlation between nostalgia proneness and cognitive empathy,  $z(516) = 3.11$ ,  $p = .002$ .

**Correlations after controlling for gender and age.** Both gender and age were related to the BES subscales. Women evinced higher affective and cognitive empathy than men, and age was negatively associated with affective empathy. However, regression

analyses revealed that controlling for gender and age did not alter the relation between nostalgia proneness and either affective empathy,  $b = 0.09$ ,  $SE = .02$ ,  $t(514) = 5.05$ ,  $p < .001$ , or cognitive empathy,  $b = 0.04$ ,  $SE = .02$ ,  $t(514) = 1.88$ ,  $p = .043$  ( $dfs$  are reduced, because one participant did not report age).

**Summary.** Consistent with the first two studies, nostalgia proneness was positively associated with affective empathy. The relation between nostalgia proneness and affective empathy was significantly stronger than its relation with cognitive empathy.

#### **Study 4: Nostalgia Proneness, Affective Empathy, and the Mediating Role of Attachment Security**

In Studies 1-3, we documented the reliability and generality of the association between nostalgia proneness and affective empathy. In Study 4, we sought evidence for why nostalgia prone persons experience more affective empathy. We originally theorized that nostalgia proneness is associated with empathy, because nostalgia strengthens attachment security (Wildschut et al., 2006) and attachment security facilitates empathy (Mikulincer et al., 2001, 2005). In Study 4, we thus examined whether nostalgia prone individuals have higher levels of attachment security, and whether attachment security explains the relation between nostalgia proneness and affective empathy. Additionally, in the previous studies, we established the relation between nostalgia proneness and affective empathy among Dutch adults and UK children. In Study 4, we tested this relation within yet another population, US adults.

## Method

**Participants.** Two hundred and fifteen participants (95 women, 120 men) completed the study online ( $M_{\text{age}} = 37.60$  years,  $SD_{\text{age}} = 13.30$  years,  $\text{Range}_{\text{age}} = 18\text{-}71$  years). We recruited participants from the US through Amazon Mechanical Turk and paid them 50 cents.

**Nostalgia proneness.** Participants completed the SNS ( $\alpha = .94$ ;  $M = 4.38$ ,  $SD = 1.45$ ) and the NI ( $\alpha = .92$ ;  $M = 3.55$ ,  $SD = 1.01$ ). We again created composite nostalgia proneness scores by standardizing and averaging the scales ( $\alpha = .96$ ). (One participant did not complete the NI, and so we only used their SNS score).

**Attachment security.** Participants completed the Security subscale of the Attachment Style Questionnaire (ASQ; Hofstra, Van Oudenhoven, & Buunk, 2005). They responded (1 = *strongly disagree*, 5 = *strongly agree*) to eight statements (e.g., “I trust other people and I like it when other people can rely on me”). These statements formed a reliable index ( $\alpha = .88$ ) and, after appropriate reverse-scoring, we averaged responses to compute attachment security scores (see Table 5 for descriptive statistics). The ASQ was ideally suited to our purposes, because it contains one subscale that reflects individuals’ level of attachment security. Other attachment scales (e.g., Experiences in Close Relationship—Revised; Fraley, Waller, & Brennan, 2000) measure attachment style with separate subscales for attachment avoidance and anxiety, with attachment security being represented by the combination of low avoidance/low anxiety. These attachment scales do not lend themselves well to testing attachment security as a mediator.

**Empathy.** To assess affective empathy briefly in this online study, we generated four statements based on a review of the literature (Cuff et al., 2016) and feedback from colleagues. In a separate study, we validated this new scale, showing that it is highly correlated with another affective empathy measure, the Empathic Concern subscale from the Interpersonal Reactivity Index (Davis, 1980),  $r(221) = .61$ ,  $p < .001$ . We also conducted an

exploratory principal factor analysis on the four empathy statements (KMO = .82; Bartlett's test of sphericity:  $\chi^2(6) = 719.85, p < .001$ ; Determinant = .035). This yielded one factor with an Eigenvalue greater than 1, which accounted for 79.50% of the variance. The four statements (1 = *strongly disagree*, 5 = *strongly agree*) were: "concern for the fate of others," "empathy for the less fortunate," "tenderness for the less fortunate," and "sympathy for the less fortunate." We averaged responses to create affective empathy scores ( $\alpha = .93$ ; see Table 5 for descriptive statistics).

## Results and Discussion

**Zero-order correlations and controlling for affect and gender.** First, we computed correlation coefficients among nostalgia proneness, attachment security, and affective empathy (Table 5). Nostalgia proneness was positively related to attachment security and affective empathy. Also, attachment security and affective empathy were positively inter-related. Women again scored higher than men on affective empathy. However, controlling for gender and age did not alter the significance of the relation between nostalgia proneness and attachment security,  $b = 0.14, SE = .06, t(211) = 2.31, p = .022$ , the relation between nostalgia proneness and affective empathy,  $b = 0.35, SE = .07, t(211) = 5.20, p < .001$ , or the relation between attachment security and affective empathy,  $b = 0.46, SE = .07, t(211) = 6.45, p < .001$ .

**Mediation analysis.** Next, to test whether the relation between nostalgia proneness and affective empathy can be explained by attachment security, we conducted a bootstrapped mediational analysis (5000 resamples using PROCESS; Hayes, 2013). The indirect effect (denoted as  $ab$ , effect size as  $ab_{fs}$ ) of nostalgia on empathy via attachment security was significant,  $ab = 0.063, SE = 0.032, 95\% CI = [0.004, 0.132], ab_{fs} = 0.059$  (Figure 1) and remained so when controlling for gender and age,  $ab = 0.058, SE = 0.029, 95\% CI = [0.007, 0.120], ab_{fs} = 0.057$ .<sup>6</sup>

**Summary.** Study 4 extended our prior findings and previous research, revealing that nostalgia prone individuals have greater attachment security. Critically, the association between nostalgia proneness and affective empathy was, in part, accounted for by attachment security.

**Study 5: Nostalgia Proneness, Prosocial Behavior,  
and the Mediating Roles of Attachment Security and Affective Empathy**

We had two goals in Study 5. One was to examine the reliability of Study 4 findings. We used the same scales to measure nostalgia proneness, attachment security, and empathy as we did in Study 4, and we recruited participants from the same population. Our primary goal in Study 5, however, was to find out whether nostalgia prone individuals also display more prosocial behavior, by virtue of their heightened capacity for affective empathy.

Empathy is a pivotal contributor to prosocial behavior. Prior research has demonstrated that affective empathy, in particular, is critical for prosocial behavior (Edele et al., 2013), suggesting that nostalgia prone individuals, by virtue of their heightened empathy, would be more prosocial. To test this possibility directly, we assessed prosocial behavior with a new task designed for online studies. Specifically, we gave participants the opportunity to donate a portion of their participation earnings to an ostensible charity.

Drawing from Study 4, we hypothesized that nostalgia proneness would be associated with affective empathy, and that attachment security would mediate this relation. We further hypothesized that affective empathy would, in turn, predict increased prosocial behavior. Stated differently, we hypothesized that nostalgia proneness would be linked with prosocial behavior via attachment security and, subsequently, affective empathy. Accordingly, we tested the following serial indirect effect: nostalgia proneness  $\Rightarrow$  attachment security  $\Rightarrow$  affective empathy  $\Rightarrow$  prosocial behavior.

## Method

**Participants.** Two hundred and thirty-four participants (114 women, 120 men) completed the study online ( $M_{\text{age}} = 38.08$  years,  $SD_{\text{age}} = 13.03$  years,  $\text{Range}_{\text{age}} = 20\text{-}79$  years). We recruited them from the USA through Amazon's Mechanical Turk and paid them 50 cents.

**Nostalgia proneness, attachment security, and empathy.** Participants completed the SNS ( $\alpha = .95$ ;  $M = 4.28$ ,  $SD = 1.44$ ) and NI ( $\alpha = .90$ ;  $M = 3.47$ ,  $SD = 0.91$ ). As before, we standardized and averaged these scales to create composite nostalgia proneness scores ( $\alpha = .96$ ). (One participant did not complete the SNS, and so we used their NI score; three participants did not complete the NI, and so we used their SNS score). Additionally, participants completed the Security subscale of the ASQ ( $\alpha = .90$ ) and the affective empathy scale ( $\alpha = .92$ ) described in Study 4 (see Table 6 for descriptive statistics).

**Prosocial behavior.** We created a task that assesses whether participants donate money when given the opportunity. At the end of the study, we informed participants that we were investigating prosocial attitudes along with a (bogus) charity, the American Volunteer Association (AVA), a non-profit organization that recruits volunteers for several charitable causes. Part of our arrangement with the AVA involved giving participants the opportunity to make a donation to it. Participants could donate a portion of their participation earnings (0-50 cents) to the AVA. We provided a space for them to indicate the amount they wished to donate. The donated amount was not normally distributed, as more than half of the participants did not make a donation (151 did not donate, 83 donated). For this reason, we coded whether or not participants made a donation; this binary variable served as our primary outcome of interest.<sup>7</sup>

To probe for suspicion, we asked an open-ended question: “Do you have any thoughts or feelings about the American Volunteer Association?” Fourteen participants either expressed suspicion about the AVA’s existence or stated that they did not believe it was real. We excluded these 14 participants from analyses involving this measure (of the remaining participants, 144 did not donate and 76 donated). Inclusion of the 14 participants did not alter the pattern of statistically significant results reported below. Finally, provided participants with links to real charities to which they could make online donations, if they wished to do so.

## Results and Discussion

Table 6 displays the zero-order correlations among all variables.

**Replicating Study 4.** First, we tested whether the current study replicated the results of Study 4. As in Study 4, nostalgia proneness was positively related to attachment security and affective empathy. Attachment security and affective empathy were also positively inter-related. Additionally, as in Study 4, women scored higher than men on affective empathy. However, controlling for gender and age did not change the significance of the relations between nostalgia proneness and attachment security,  $b = 0.18$ ,  $SE = .06$ ,  $t(230) = 3.00$ ,  $p = .003$ , between nostalgia proneness and affective empathy,  $b = 0.21$ ,  $SE = .06$ ,  $t(230) = 3.41$ ,  $p = .001$ , or between attachment security and affective empathy,  $b = 0.30$ ,  $SE = .07$ ,  $t(230) = 4.48$ ,  $p < .001$ . Finally, as in Study 4, the indirect effect of nostalgia proneness on affective empathy through attachment security was significant,  $ab = 0.047$ ,  $SE = 0.025$ , 95% CI = [0.009, 0.110],  $ab_{fs} = 0.048$ , and remained significant when controlling for gender and age,  $ab = 0.047$ ,  $SE = 0.025$ , 95% CI = [0.010, 0.111],  $ab_{fs} = 0.049$ . In all, Study 5 replicated the results of Study 4.

**Nostalgia proneness and prosocial behavior.** Extending beyond Study 4, we tested whether nostalgia proneness was associated with prosocial behavior. Nostalgia proneness was positively associated with donating (vs. not donating) money to the AVA. Affective empathy was also positively associated with donating (vs. not donating) money to the AVA. We then tested the serial indirect effect: nostalgia proneness  $\Rightarrow$  attachment security  $\Rightarrow$  affective empathy  $\Rightarrow$  prosocial behavior (5000 bootstrapped samples using PROCESS; Hayes, 2013; Figure 2). This effect (denoted  $ab_1b_2$ ) was significant,  $ab_1b_2 = 0.018$ ,  $SE = 0.016$ , 95% CI = [0.001, 0.072], and remained so when controlling for gender and age,  $ab_1b_2 = 0.0154$ ,  $SE = 0.014$ , 95% CI = [0.0005, 0.069].

**Summary.** Study 5 directly replicated Study 4, illustrating that attachment security, in part, helps explain the relation between nostalgia proneness and affective empathy. Crucially, Study 5 built upon Study 4, illustrating that nostalgia proneness is linked with prosocial behavior, and that this link is serially mediated by attachment security and affective empathy. Lastly, Study 5 made a methodological contribution by pioneering a brief, efficient, and inexpensive online method for measuring prosocial behavior.

### General Discussion

Are nostalgia prone people empathic and prosocial? The current set of studies offers an affirmative answer to this question. We measured nostalgia proneness and affective empathy in all studies, using three measures of affective empathy. Regardless of the measure, nostalgia proneness was associated with greater affective empathy. In all studies, we obtained this relation when controlling for gender and age. Also, we drew participants from multiple populations (Dutch adults, UK children, US adults), and nostalgia proneness predicted greater affective empathy in each sample. Moreover, in Study 1, we relied on a representative Dutch sample and found that the relation between nostalgia proneness and affective empathy held



when controlling for core (Big Five) personality traits and did not vary as a function of key demographic variables. Across the five studies, we replicated the association between nostalgia proneness and affective empathy both directly and conceptually. In Study 3, we measured cognitive empathy, in addition to affective empathy, and obtained a marginal relation between nostalgia proneness and cognitive empathy. The relation between nostalgia proneness and affective empathy was significantly stronger than the relation between nostalgia proneness and cognitive empathy. In Studies 4-5, we found that nostalgia prone individuals had elevated levels of attachment security, and that attachment security mediated the relation between nostalgia proneness and empathy. Finally, in Study 5, we introduced an online task to measure prosocial behavior and found that nostalgia prone individuals were more likely to donate money when given the opportunity to do so, and that this relation was mediated serially by attachment security and affective empathy.

### **The Psychological Profile of Nostalgia Proneness**

Our research paints a richer picture of what it means to be nostalgia prone. Previous work has alluded to the social character of nostalgia prone individuals by demonstrating, for instance, that they prefer activities involving others (Batcho, 1998) and have a stronger sense of social support (Zhou et al., 2008). Yet, other findings muddied the waters, showing, for example, that nostalgia proneness is associated with neuroticism (Barrett et al., 2010; Seehusen et al., 2013, Stephan et al., 2014) and a tendency to use autobiographical memories to revive resentment toward others (Cheung et al., 2018). When these findings are considered within a broader, multivariate context, the more negative aspects of nostalgia proneness can be reinterpreted in terms of nostalgia's sociality. To illustrate, when one takes into account (through partialling) the fact that both neuroticism and nostalgia proneness are positively correlated with the need to belong, the correlation between neuroticism and nostalgia

prone to nostalgia disappears (Seehusen et al., 2013). Nonetheless, this multivariate approach is not without limitations, as it can obscure the interpretation of partialled-out variables (Lynam et al., 2006). To address this issue, we tested the pure, unalloyed association between nostalgia proneness and sociality, in the form of empathy and prosocial behavior. Our findings provided robust, replicable, and unqualified evidence that nostalgic individuals are empathic; that is, they attend to the experiences and share the emotions of others. Moreover, the findings indicated that nostalgic persons are more likely to behave in ways that are helpful to those in need. We note that, as neither nostalgia (Sedikides et al., 2015) nor empathy (Batson, 2011; Tullett, Harmon-Jones, & Inzlicht, 2012) is purely positive, these findings cannot be readily explained in terms of a general disposition to experience positive affect. Beyond these primary contributions, our research produced novel findings that further clarify the character of nostalgia proneness.

To begin, although experimental research has shown that nostalgia strengthens attachment security (Wildschut et al., 2006), ours is the first to demonstrate that nostalgia prone individuals possess higher levels of attachment security, revealing that they not only desire interpersonal bonds (Batcho, 1998; Seehusen et al., 2013), but also feel secure in their relationships. Additionally, Study 1 is the first to document that nostalgia proneness is positively associated with agreeableness. Agreeableness represents the tendency and motive to maintain functional relationships (Jensen-Campbell & Graziano, 2001). Indeed, agreeable individuals have high-quality relationships and are more satisfied with their relationships (Jensen-Campbell, Knack, & Gomez, 2010). Hence, our findings that nostalgia prone individuals are agreeable further attest to their ability to establish, maintain, and develop interpersonal bonds.

## Future Empirical Directions and Clarifications

Our findings set the stage for further exploration of the relation between nostalgia proneness and prosociality. Empathy contributes to volunteering (Pavey et al., 2012) and sharing (Edele et al., 2013). It is also associated with inclusiveness and acceptance of others, such as reduced prejudice (Bäckström & Björklund, 2013). Empathic individuals are less likely to bully, be aggressive, and commit crimes (Jolliffe & Farrington, 2004, 2006b), and are better capable of negotiating relational problems (Chartrand & Bargh, 1999). These findings suggest that nostalgia prone individuals may be prosocial in several ways. For example, analyses of dyadic conversations can address whether such individuals are better listeners, and teacher reports can determine if nostalgia prone children are less likely to bully their peers.

We have largely focused on the social character of nostalgia prone persons and have highlighted the contribution of our work to this facet of nostalgia proneness. However, we do not mean to suggest that nostalgia prone individuals are social at the expense of attention toward themselves. To the contrary, prior work suggests that nostalgic individuals may also be self-reflective. For example, in nostalgic narratives, the self plays a protagonistic role (Wildschut et al., 2006). Additionally, momentary nostalgia is a self-conscious emotion, involving self-awareness and self-evaluation, and it is similar to self-compassion (Van Tilburg, Wildschut, & Sedikides, 2018). Moreover, momentary nostalgia bolsters positive self-regard (Hepper et al., 2012) and fosters perceptions of a stable and coherent view of one's self over time (Sedikides et al., 2016). Finally, momentary nostalgia increases the accessibility of one's intrinsic self-concept (who one believes they truly are), and nostalgia proneness is positively associated with the expression of one's intrinsic self (Baldwin et al., 2015). However, prior work has predominantly focused on momentary nostalgia, rather than

nostalgia proneness. Future research is thus needed to understand more fully the self-reflective nature of nostalgia prone persons.

There is a lack of nostalgia research among children. Study 2 begins to address this void and paves the way for follow-up investigations. First, nostalgia proneness, which is often ascribed to older adults in everyday discourse, can be assessed in young children. Study 2 is one of very few to have done so (Batcho, 1995; Zhou et al., 2008). Our findings indicate that nostalgia proneness bears similar relations with other constructs among children as it does among adults. Still, Batcho (1995) reported that the content of children's nostalgic reflections differs from that of adults. Research is needed to systematically address the similarities and differences between adults' and children's nostalgia, at both the state and trait levels.

### **Limitations**

The underlying causal model that informed our hypothesis was that nostalgia proneness fosters empathy, via attachment security. However, our correlational designs prevent causal inferences. It is possible, for example, that empathy fosters nostalgia proneness, and our data cannot rule this out. It is important to note, however, that although our hypothesis was informed by an underlying causal model, our primary empirical objective was to understand what it means to be a nostalgia prone individual—an objective for which correlational designs are appropriate. Additionally, although reverse causation is possible, we do not have an a priori theoretical rationale as to why empathy would foster nostalgia proneness. Conversely, our rationale for the relation between nostalgia proneness and empathy was based, in part, on experimental research that had established a causal effect of momentary nostalgia on attachment security (Wildschut et al., 2006) and empathy (Zhou et al., 2012). To summarize, we cannot (and do not) make causal claims based on our

correlational research; however, our correlational findings are consistent with experimental research demonstrating that momentary nostalgia increases attachment security and empathy.

Also, despite our research being correlational, we did not rely exclusively on self-reports. In Study 5, we measured behavior and found that it was correlated with self-reports in theoretically consistent ways. Nevertheless, it would also be useful for future research to measure empathy in ways that less directly rely on self-report, such as via participants' reactions to pictures or stories of others (Westbury & Neumann, 2008).

Also, our research does not provide a comprehensive explanation for why nostalgia prone individuals are empathic. Again, our correlational designs preclude causal claims regarding the role of attachment security. Beyond this, in our mediation analyses, the relation between nostalgia proneness and empathy was still sizable after controlling for attachment security, suggesting that there may be further reasons why nostalgia prone persons are more empathic. As reviewed in the Introduction, momentary nostalgia bears psychological well-being benefits, and nostalgia prone individuals are likely to reap these benefits (Baldwin et al., 2015; Juhl et al., 2010). Psychological well-being is related to increased empathy (Thomas et al., 2007). Thus, nostalgia prone individuals may be more empathic in part due to their higher well-being: Nostalgia's contribution to well-being may partly enable nostalgia prone individuals to be more empathic.

Another reason why nostalgia proneness may be associated with greater empathy pertains to their emotionality. Nostalgia prone individuals tend to be more emotional (i.e., experience emotions intensely; Batcho, 1998). Their emotionality may nurture the capacity to feel the emotions of others. Our finding that nostalgia proneness is associated more strongly with affective empathy than cognitive empathy is consistent with this possibility.

### **Concluding Remarks**

The present work established the empathic nature of nostalgia prone individuals. It further revealed that nostalgia prone persons have greater attachment security and are more agreeable. Jointly, these findings lift the cloud of uncertainty over the presumed sociality of nostalgia prone persons, and elucidate their prosocial orientation and, indeed, behavior.

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## Footnotes

1. Data on income were not available for all LISS participants. However, CentERdata computed gross household income for most participants ( $N = 772$ ), using an imputation procedure ([http://www.lissdata.nl/dataarchive/study\\_units/view/322](http://www.lissdata.nl/dataarchive/study_units/view/322)).
2. For the four studies in which participants completed both the SNS and the NI, the scales were highly correlated ( $.52 < r_s < .68$ ). We first standardized the scales and then averaged responses across both scales to create a nostalgia index. Accordingly, we report reliability coefficients for the linear combination of the two scales (denoted  $\alpha$ ). We computed these reliabilities using equation 7-16 of Nunnally and Bernstein (1994).
3. The original Mehrabian and Epstein (1972) empathy scale contains 33 items. However, for reasons unknown to us, only eight items were included in this LISS study.
4. We also considered level of education as a categorical moderator, and, again, it did not moderate the relation between nostalgia proneness and affective empathy,  $F(8, 805) = 0.51, p = .850$ .
5. The reliability of this scale was somewhat low in this sample. In exploratory analyses, we omitted the three items with the lowest corrected item-total correlations (increasing the reliability to  $\alpha = .72$ ) and re-ran all of the analyses with this alternative, more reliable, scale. The new analyses produced virtually identical results to those reported in the main text.
6. By using the term ‘indirect effect’ we do not mean to claim evidence for a causal effect, as the present study is correlational. We use ‘indirect effect’ to refer to the significant change in the relation between two variables when additional mediating variables are statistically controlled for.
7. We also ran the same set of analyses on the original raw donations. The results of these supplementary analyses were virtually identical to those with the dichotomous variable.

Table 1.

*Descriptive Statistics and Correlations Among Measured Variables in Study 1*

Scale	<i>M</i>	<i>SD</i>	Correlation with							Gender	Age
			AE	N	E	A	C	O			
Nostalgia proneness	0.00	0.90	.30**	.12**	.07*	.21**	.10*	.07 <sup>†</sup>	.04	.03	
Affective Empathy (AE)	4.37	1.09	--	.28**	-.03	.31**	.08*	-.05	.18**	.18**	
Neuroticism (N)	2.52	0.64		--	-.17**	-.14**	-.21**	-.20**	.12**	-.08*	
Extraversion (E)	3.08	0.54			--	.24**	.05	.30**	.03	-.10*	
Agreeableness (A)	3.84	0.51				--	.34**	.25**	.31**	.05	
Conscientiousness (C)	3.72	0.51					--	.24**	.05	.22**	
Openness (O)	3.44	0.48						--	-.05	-.14**	

Note. <sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .001$ . Correlations with gender are point-biserial (men = 0, women = 1).  $N = 823$ .  $Df = 821$ .

Table 2.

*Hierarchical Regression Analysis Predicting Affective Empathy in Study 1*

	Predictor	<i>b</i>	<i>t</i>
Step 1:	Gender	0.44	5.87**
	Age	0.01	5.77**
Step 2:	Gender	0.12	1.67 <sup>†</sup>
	Age	0.01	5.72**
	Neuroticism	0.55	10.00**
	Extroversion	-0.06	-0.88
	Agreeableness	0.73	9.60**
	Conscientiousness	-0.01	-0.07
	Openness	-0.06	-0.78
Step 3:	Gender	0.14	1.96*
	Age	0.01	5.71**
	Neuroticism	0.49	9.00**
	Extroversion	-0.08	-1.19
	Agreeableness	0.65	8.50**
	Conscientiousness	-0.03	-0.39
	Openness	-0.07	-0.95
	Nostalgia Proneness	0.24	6.43**

Note. <sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .001$ . Gender was coded as men = 0, women = 1.  $N = 823$ . Step 1  $df = 820$ , step 2  $df = 815$ , step 3  $df = 814$ .



Table 3.

*Descriptive Statistics and Correlations Among Measured Variables in Study 2*

Scales	<i>M</i>	<i>SD</i>	Correlation with		
			AE	Gender	Year
Nostalgia proneness	4.28	1.37	.26*	.06	-.12
Affective Empathy (AE)	4.12	0.74	--	.29**	.17*

Note. \*  $p < .05$ , \*\*  $p < .001$ . Correlations with gender are point-biserial (men = 0, women = 1). Year was coded as year 5 = 0, year 6 = 1.  $N = 132$ .  $Df = 130$ .

Table 4.

*Descriptive Statistics and Correlations Among Measured Variables in Study 3*

Scale	<i>M</i>	<i>SD</i>	Correlation with			
			AE	CE	Gender	Age
Nostalgia proneness	0.00	0.89	.19**	.07 <sup>†</sup>	-.03	.04
Affective Empathy (AE)	2.82	0.39	--	.35**	.34**	-.20**
Cognitive Empathy (CE)	2.95	0.39		--	.24**	-.01

Note. <sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .001$ . Correlations with gender are point-biserial (men = 0, women = 1).  $N = 519$ ;  $N = 518$  for correlations with age.  $Df = 517$ ;  $df = 516$  for correlations with age.

Table 5.

*Descriptive Statistics and Correlations Among Measured Variables in Study 4*

Scales	<i>M</i>	<i>SD</i>	Correlation with			
			AS	AE	Gender	Age
Nostalgia proneness	0.00	0.92	.16*	.34**	.11 <sup>†</sup>	-.07
Attachment Security (AS)	3.69	0.83	--	.42**	.08	.12 <sup>†</sup>
Affective Empathy (AE)	3.86	0.98		--	.28**	.14*

Note. <sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .001$ . Correlations with gender are point-biserial (men = 0, women = 1).  $N = 215$ .  $Df = 213$ .

Table 6.

*Descriptive Statistics and Correlations Among Measured Variables in Study 5*

Scales	<i>M</i>	<i>SD</i>	Correlation with				
			AS	AE	DO	Gender	Age
Nostalgia proneness	0.00	0.91	.19*	.22**	.17*	.03	.04
Attachment Security (AS)	3.74	0.82	--	.28**	.01	.04	-.03
Affective Empathy (AE)	3.99	0.88		--	.19*	.17*	.07
Donation (DO)	--	--			--	.16*	.06

Note. \*  $p < .05$ , \*\*  $p < .001$ . Correlations with Donation (did not give a donation = 0, gave a donation = 1) and gender (men = 0, women = 1) are point-biserial.  $N = 234$ ;

$N = 220$  for statistics concerning donation.  $Df = 232$ ;  $df = 218$  for statistics concerning donation.

Figures

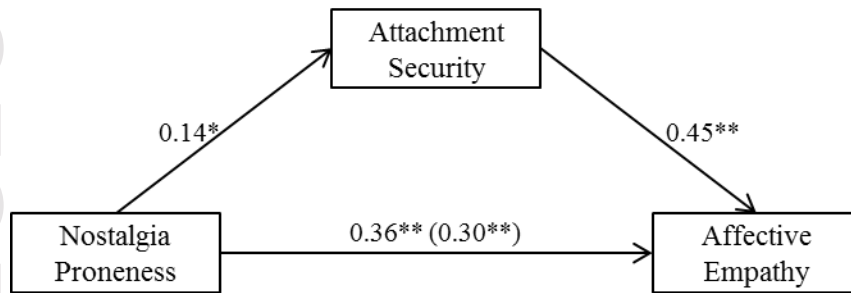


Figure 1. Mediation of the relation between nostalgia proneness and affective empathy by attachment security in Study 4.

\*  $p < .05$ , \*\*  $p < .001$ .

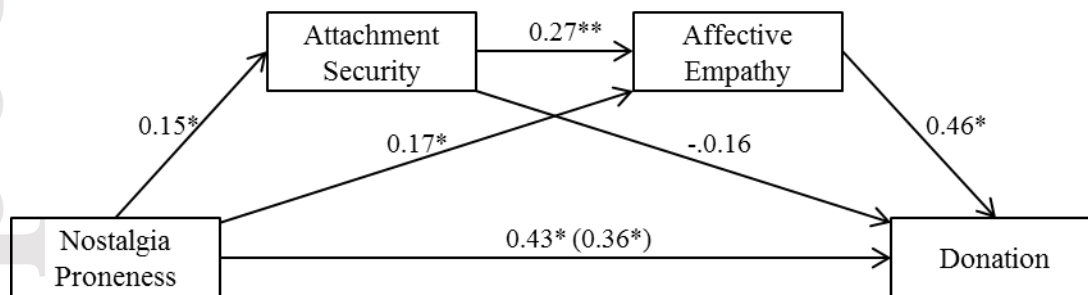


Figure 2. Serial mediational model tested in Study 5. The model demonstrates (a) mediation of the relation between nostalgia proneness and affective empathy by attachment security, and (b) serial mediation of the relation between nostalgia proneness and donation by security and affective empathy. \*  $p < .05$ , \*\*  $p < .001$ .