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To cite this article: Mike Kersten, Cathy R. Cox & Erin A. Van Enkevort (2016): An exercise in nostalgia: Nostalgia promotes health optimism and physical activity, *Psychology & Health*, DOI: [10.1080/08870446.2016.1185524](https://doi.org/10.1080/08870446.2016.1185524)

To link to this article: <http://dx.doi.org/10.1080/08870446.2016.1185524>



Accepted author version posted online: 02 May 2016.
Published online: 20 May 2016.



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An exercise in nostalgia: Nostalgia promotes health optimism and physical activity

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(Received 14 December 2015; accepted 28 April 2016)

Objective: Previous research has shown that nostalgia, a sentimental longing for the past, leads to greater feelings of optimism, with other work demonstrating that optimistic thinking (general & health-orientated) is associated with better physical and psychological health. Integrating these two lines of research, the current studies examined whether nostalgia-induced health optimism promotes attitudes and behaviours associated with better physical well-being.

Methods: Participants, in three experiments, were randomly assigned to write about either a nostalgic or ordinary event. Following this, everyone completed a measure of health optimism (Studies 1–3), measures of health attitudes (Study 2) and had their physical activity monitored over the course of 2 weeks (Study 3).

Results: The results revealed that, in comparison to control conditions, nostalgic reverie led to greater health optimism (Studies 1–3). Further, heightened health optimism following nostalgic reflection led to more positive health attitudes (Study 2), and increased physical activity over a two-week period (i.e. Fitbit activity trackers; Study 3).

Conclusions: These findings highlight the importance of nostalgia on health attitudes and behaviours. Specifically, this work suggests that nostalgia can be used as a mechanism to increase the importance, perceived efficacy and behaviour associated with better physical health.

Keywords: nostalgia; health optimism; physical health; health behaviour; well-being

Approximately half of all Americans make a resolution each year to improve their physical health (e.g. lose weight, exercise; Norcross, Mrykalo, & Blagys, 2002). Although people set these goals with good intentions, research demonstrates that only 8% of individuals actually achieve their resolutions (Statistics Brain Research Institute, 2016). Given the number of individuals who struggle to maintain regular exercise and healthier lifestyles (Warburton, Nicol, & Bredin, 2006), one challenge for American society is to identify effective methods for improving people's physical health.

One perspective that may be useful in understanding *why* individuals engage in health-relevant behaviours is research on nostalgia, or a sentimental longing for the past (Sedikides et al., 2015). Although nostalgia was once viewed as a medical disease, contemporary research in personality and social psychology has found that nostalgic reverie

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leads to greater psychological and social well-being (Routledge, Wildschut, Sedikides, & Juhl, 2013). For example, engaging in nostalgic reflection has been found to increase feelings of positive affect (Wildschut, Sedikides, Arndt, & Routledge, 2006), enhance self-esteem (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012), heighten meaning and satisfaction in life (Cox, Kersten, Routledge, Brown, & Van Enkevort, 2015; Routledge et al., 2011) and facilitate the formation of close relationships (Wildschut et al., 2006). Further, although nostalgia can be a bittersweet emotion associated with sadness (e.g. separation from or death of a loved one; Hepper, Ritchie, Sedikides, & Wildschut, 2012), research has found that written passages about nostalgic (vs. ordinary) events contain greater levels of positive emotion (e.g. happiness, fondness) than negative emotion (e.g. regret, sadness; Sedikides, Wildschut, Arndt, & Routledge, 2008). This is consistent with theory and research demonstrating that nostalgia has redemptive qualities where individuals have a tendency of turning negative psychological states into predominately positive ones (McAdams, 2001).

Research also demonstrates that nostalgia may provide positive benefits for one's physical health. From a nostalgia perspective, positivity derived from reflecting on one's past might extend in time to produce a more optimistic outlook on the future. To test this, Cheung and colleagues (2013) randomly assigned participants to write about a nostalgic event vs. an ordinary life event and responses were coded for optimistic thinking (70 words – e.g. *hope, optimistic, determined*). Results revealed that nostalgic narratives (vs. ordinary narratives) contained greater expressions of optimism. This was supported by additional evidence demonstrating that participants reported greater feelings of optimism via feelings of social connectedness and self-esteem following thoughts of nostalgia vs. an ordinary event (the control condition). However, whereas this work suggests that nostalgia can provide a more positive outlook on life by leading to greater perceptions of general optimism, one question is whether nostalgic reverie can increase optimism within a specific domain (e.g. health).

Over the past few decades, there has been a growing interest in the relationship between personality characteristics and health (e.g. Bogg & Roberts, 2004; Friedman et al., 1993, 1995; Magee, Heaven, & Miller, 2013). One trait associated with greater well-being is dispositional optimism – that is, feeling hopeful about the future (Scheier & Carver, 1992). A more positive life orientation is connected to better psychological health as high (compared to low) optimistic individuals utilise more adaptive coping strategies, have more supportive relationships and are more likely engage in preventative health behaviours (Carver, Scheier, & Segerstrom, 2010). For instance, Aspinwall and Taylor (1992) studied a group of undergraduate students in their first semester of college and found that higher levels of dispositional optimism were associated with lower levels of stress, loneliness and depression 3 months later. Further, optimism (generally) and health optimism (in particular) has been found to be associated with greater physical well-being, with more optimistic individuals having improved physical functioning, reporting less pain, experiencing fewer physical symptoms of illness and being less likely to be rehospitalised following major surgery (Rasmussen, Scheier, & Greenhouse, 2009; Tindle et al., 2012). Additional evidence for the beneficial effects of optimism was recently found in a meta-analysis of 84 studies across various health outcomes (e.g. cancer, heart disease, immune functioning, pain, pregnancy; Rasmussen et al.; also see Warner, Schwarzer, Schütz, Wurm, & Tesch-Römer, 2012). In each case,

optimism was a significant predictor of physical health ($ps < .001$) with small to moderate effect sizes (.10–.27).

Given the positive relationship between optimism and physical well-being, and building on the results of Cheung et al. (2013), nostalgia may motivate people to engage in greater preventative health behaviours by increasing more optimistic feelings about the future. Thus, the purpose of the present research was to examine whether nostalgic reverie increases feelings of health optimism (Studies 1–3), and whether this heightened optimism leads to greater attitudes (Study 2) and behaviours (Study 3) associated with better physical health. Whereas, Study 2 examined people's intentions to exercise and eat healthy, Study 3 assessed actual physical activity over the course of 2 weeks. Through the use of statistical mediation, it was hypothesised that participants who recalled a nostalgic (vs. ordinary) event would report increased health optimism, which in turn, would be associated with greater health intentions and behaviour.

Study 1

One hundred and twelve undergraduate students from an introductory psychology course participated in exchange for partial course credit.¹ Five people were dropped after indicating that they rushed through the study and were not careful in responding, whereas an additional two people were excluded for guessing the experimental hypothesis during a verbal debriefing. This resulted in a final sample of 105 students (56 female; $M_{\text{age}} = 19.74$).²

Based on previous research (Routledge et al., 2013; Sedikides et al., 2008), participants were randomly assigned to one of two different writing conditions. In the nostalgia condition, individuals were provided with a definition of nostalgia (i.e. 'According to the Oxford Dictionary, 'nostalgia' is defined as a 'sentimental longing for the past') and instructed to write about a nostalgic event (i.e. 'think of a nostalgic event in your life ... specifically, try to think of a past event that makes you feel most nostalgic').³ Conversely, participants in the control condition were instructed to write about an ordinary event (i.e. 'bring to mind an ordinary event in your life'). Following the writing task, everyone answered three questions as a manipulation check (1 = *Strongly disagree*; 9 = *Strongly agree*): 'Right now, I am feeling quite nostalgic', 'Right now, I am having nostalgic feelings' and 'I feel nostalgic at this moment' ($\alpha = .98$). Next, everyone completed a 16-item measure of health optimism (Aspinwall & Brunhart, 1996). The scale consisted of 11 positively worded items (e.g. 'If I did get a serious illness, I would recover from it sooner than most other people') and five negatively worded items (e.g. 'I will probably die from illness or accident instead of old age'). To reduce suspicion, four filler statements were also included (e.g. 'I only think about my health when I am sick'). Responses to all items were reported on a nine-point scale (1 = *Strongly agree*; 9 = *Strongly disagree*). All negatively worded items were reverse-scored and averaged with the positive items to create an overall measure of health optimism ($\alpha = .73$).⁴

Data analysis plan

Results, for all studies, were analysed using SPSS (Statistical Packages for the Social Sciences) Version 22. Two-tailed independent *t*-tests with an alpha set at .05 examined the influence of the nostalgia manipulation on health optimism scores (Studies 1–3),

health attitudes (Study 2) and health behaviour (Study 3). Preacher and Hayes (2004) 'Indirect' macro was utilised to assess for statistical mediation.⁵ For Studies 2–3, health attitude and physical activity scores were regressed separately onto nostalgia condition (dummy coded: nostalgia = 0, ordinary event = 1) with health optimism scores entered as the statistical mediator. For each model, 5000 bootstrap resamples were performed and the 95% confidence interval was used to determine significance. Across all studies, Cohen's d was used as a measure of effect size (Cohen, 1992).

Results and discussion

Study 1 results revealed that participants who recalled a nostalgic event reported greater feelings of state nostalgia (manipulation check; $M = 6.10$, $SD = 2.13$) and higher levels of health optimism ($M = 5.75$, $SD = .84$) compared to those who recalled an ordinary event (nostalgia $M = 4.33$, $SD = 2.31$; health optimism $M = 5.41$, $SD = .73$), nostalgia $t(103) = 4.09$, $p \leq .001$, $d = .80$; health optimism, $t(103) = 2.17$, $p = .03$, $d = .43$.

These results provide initial support that nostalgic reverie increases optimistic perceptions about individuals' physical health. The following studies were conducted to improve these findings in two different ways. First, to make a convincing case that nostalgia is associated with better health, it is important to examine health intentions directly. Building on the large literature demonstrating an associative link between optimistic thinking and physical health (Rasmussen et al., 2009; Tindle et al., 2012; Warner et al., 2012), Studies 2–3 examined statistically whether heightened health optimism following nostalgic reverie was associated with greater health intentions and behaviours. Second, to improve the generalisability of the current findings, we examined whether the increase in health-orientated attitudes following a nostalgia manipulation is applicable to both college-age and general populations.

Study 2

Participants consisted of 125 individuals: 71 workers recruited from Amazon's Mechanical Turk (mTurk) who received \$1.00 in payment compensation and 54 undergraduate students who received partial course credit. Seven participants were excluded for indicating that they rushed through the study and were not careful in responding, resulting in a final sample of 118 individuals (68 female; $M_{\text{age}} = 27.80$).⁶ This was an adequate number of participants to determine statistical significance based on the moderate effect size found in Study 1 and the recommendation of the *G*Power* data analysis program (Faul, Erdfelder, Lang, & Buchner, 2007).

Following the same materials and procedure described in Study 1, participants completed a nostalgia manipulation, a nostalgia manipulation check ($\alpha = .99$) and health optimism measure ($\alpha = .80$). Following this, everyone answered questions using a modified version of the Health Behavior Checklist (Vickers, Conway, & Hervig, 1990). This scale assessed a broad range of health-related behaviour intentions (e.g. 'I intend to get at least 30 min of exercise 5 days a week', 'I intend to eat at least five servings of fruit and vegetables each day'; $\alpha = .85$). Next, participants completed five items from the Aspirations Index (Kasser & Ryan, 1996), which measures people's intrinsic aspiration to achieve a healthier lifestyle. Each item consisted of a statement describing a life goal (e.g. 'To keep myself healthy and well'; 'To feel good about my level of physical

fitness') and participants rated: (a) the personal importance of each aspiration (i.e. health importance; $\alpha = .94$) and (b) the perceived likelihood of attaining each aspiration in the future (i.e. health likelihood; $\alpha = .91$). Finally, given that a portion of the participants in Study 2 consisted of undergraduate students, these individuals were asked about their willingness to commit to exercise behaviour directly. Specifically, participants were told that an exercise challenge was being held in the psychology department (i.e. to exercise four times a week for 4 weeks) and persons were asked about their willingness to participate (i.e. 'How interested are you in participating in the exercise challenge?'; 'How important do you think having the exercise challenge is?'; 'Do you think it is important to implement an exercise challenge like this for undergraduate students?'; $\alpha = .89$). All responses in Study 2 were reported on a nine-point scale (1 = *Strongly disagree*; 9 = *Strongly agree*).

Results and discussion

Given the significant positive correlations between the different health outcomes (i.e. health intentions, health importance and health likelihood), $r_s \geq .49$, $p_s \leq .001$, scores were converted into z -scores and then averaged together to create a composite measure of health attitudes ($\alpha = .80$). However, the exercise challenge scores were analysed separately given that they were unique to the student sample of participants.

Manipulation check

Participants who recalled a nostalgic event ($M = 7.16$, $SD = 1.96$) reported higher levels of state nostalgia compared to individuals who recalled an ordinary event ($M = 3.47$, $SD = 2.26$), $t(116) = 9.43$, $p \leq .001$, $d = 1.74$.

Health optimism

Replicating the results of Study 1, participants reported greater health optimism in response to the nostalgia manipulation ($M = 5.61$, $SD = .85$) compared to an ordinary event ($M = 5.01$, $SD = 1.06$), $t(116) = 3.43$, $p = .001$, $d = .62$.

Health attitudes

Participants who wrote about a nostalgic event reported more positive health attitudes ($M = .27$, $SD = .66$) compared to individuals who wrote about an ordinary event ($M = -.26$, $SD = .93$), $t(116) = 3.55$, $p = .001$, $d = .66$. Additionally, with respect to the exercise challenge, nostalgic individuals ($M = 7.06$, $SD = 1.66$) expressed a greater desire to participate compared to control individuals ($M = 5.91$, $SD = 1.93$), $t(49) = 2.26$, $p = .03$, $d = .64$.

Mediational analysis

To examine whether health optimism statistically mediated the effects of nostalgia on health attitudes and the exercise challenge, 5000 bootstrap resamples were performed

and the 95% confidence interval for the indirect effect did not contain zero (health attitudes: $-.43, -.10$; exercise challenge: $-1.07, -.01$). The unstandardised betas, standard errors and p -values for the path models are presented in Figures 1 and 2.

Replicating Study 1, participants reported greater feelings of health optimism after thinking about nostalgia vs. an ordinary event. This provides additional evidence that nostalgia has the potential to increase optimism for social behaviour broadly (Cheung et al., 2013) and health-relevant decisions specifically (Study 1). Second, Study 2 demonstrated that nostalgia-induced health optimism increased positive attitudes towards preventative health behaviours. Specifically, participants reported greater health aspirations and intentions to be healthy to the extent that they felt more optimistic following the nostalgia manipulation. These results were found in both college-age and general (mTurk) populations. Given that health habits are often deeply ingrained and difficult to change, Study 3 was designed to examine whether nostalgia-induced health optimism can alter health behaviour directly. To do this, a direct assessment of physical activity was utilised by equipping participants with *Fitbit* wristbands to monitor health activity over a two-week period. Similar to Study 2, it was hypothesised that participants who recalled a nostalgic vs. an ordinary event would report greater health optimism, which in turn, would be associated with greater physical activity over time.

Study 3

Sixty-three students from introductory psychology classes participated in exchange for partial course credit. Following procedures recommended by Simmons, Nelson and Simonsohn (2011) for psychological research, data were collected until the end of the semester with the goal of obtaining at least 20 observations per condition. Five participants were excluded from the final sample: three had insight into the study's aims, one expressed suspicion about the study and one reported higher than average levels of health optimism (>3 SD above the mean). This resulted in a final sample of 58 students (33 female; $M_{\text{age}} = 19.09$).

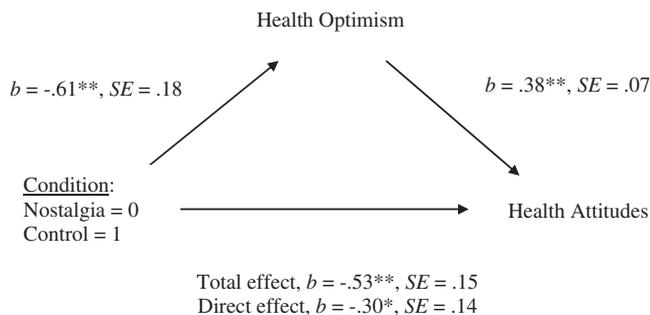


Figure 1. The indirect effect of nostalgia on health attitudes (i.e. health intentions, health importance and health likelihood) through health optimism (Study 2).

Notes: *Indicates significance at $p \leq .05$, **indicates significance at $p \leq .01$.

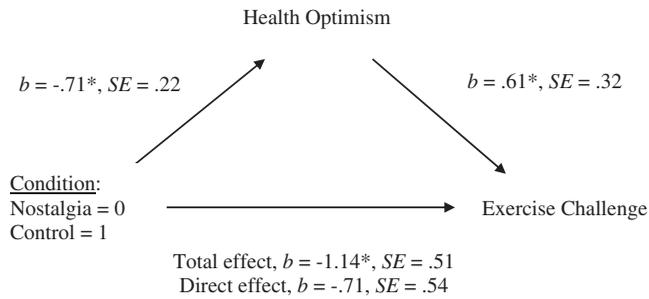


Figure 2. The indirect effect of nostalgia on exercise challenge scores through health optimism (Study 2).

Notes: *Indicates significance at $p \leq .05$, **indicates significance at $p \leq .01$.

Participants took part in four different study sessions (4–5 days apart). During Session 1, everyone was given a wireless fitness tracker to record their physical activity (e.g. steps taken) over the course of 2 weeks. Participants were also asked to complete a Qualtrics survey which contained the nostalgia manipulation and a measure of health optimism. Given that no prior work has looked at the long-term effects of nostalgic reflection, participants were asked to return to the lab at two additional time points (Sessions 2 and 3) to complete the same materials as completed in the first session. (This also provided an opportunity to charge the battery on the *Fitbit* trackers). At the conclusion of the study (Session 4 which occurred 2 weeks following the first session), all activity monitors were returned and participants' data were uploaded wirelessly via computer.

Participants completed the same nostalgia manipulation, three item manipulation check ($\alpha = .98-.99$) and measure of health optimism ($\alpha = .70-.72$) described in the previous studies. Given that materials were administered at three different time points (Session 1; Session 2 [4–5 days later]; Session 3 [4–5 days later]), participants were instructed to complete one of two different Qualtrics surveys to ensure that were assigned to the same nostalgia manipulation throughout the course of the study.

To measure physical activity, participants were given *Fitbit One* activity trackers (Fitbit Inc., San Francisco, CA). Individuals were instructed to wear the Fitbit clipped to their waistband or pocket at all times unless they were sleeping or engaging in any activity involving water (e.g. bathing, swimming). This device has been used in previous research (Diaz et al., 2015; Ferguson, Rowlands, Olds, & Maher, 2015) and provides multiple measures of physical activity (e.g. steps taken, distance travelled). However, research finds that the step count feature of the *Fitbit One* is a valid and reliable measure of physical activity, whereas such support for distance travelled has not been demonstrated (Takacs et al., 2014). For this reason, the amount of steps that everyone engaged in during the two-week experiment served as the dependent measure of physical activity. Following previous research (Troiano et al., 2008), a minimum of 10 h of accelerometer 'wear time' served as the cutoff for a valid day of measurement. All participants met this cutoff criterion. Daily step counts were averaged together to create a composite score of physical activity ($\alpha = .82$).

Results and discussion

Manipulation check

Participants who recalled a nostalgic event ($M = 6.74$, $SD = 1.96$) reported higher state nostalgia compared to those who recalled an ordinary event ($M = 3.90$, $SD = 2.47$), $t(56) = 4.89$, $p \leq .001$, $d = 1.27$.

Health optimism

Replicating the previous studies, participants who recalled a nostalgic event reported greater feelings of health optimism ($M = 5.84$, $SD = .56$) compared to those in the control condition ($M = 5.50$, $SD = .63$), $t(56) = 2.19$, $p = .03$, $d = .57$.

Physical activity

A final independent t -test assessed whether the nostalgia manipulation had a significant effect on participants' physical activity. Results revealed that participants who wrote about a nostalgic event later engaged in more physical activity ($M = 9158.80$, $SD = 2762.30$) than those who wrote about an ordinary event ($M = 7580.29$, $SD = 2512.98$), $t(56) = 2.26$, $p = .03$, $d = .60$.

Mediational analysis

To examine whether feelings of health optimism statistically mediated the effect of the nostalgia condition on physical activity, 5000 bootstrap resamples were performed and the 95% confidence interval for the indirect effect did not contain zero (-1399.49 , -21.82).⁷ Figure 3 presents the unstandardised betas, standard errors and p -values for the path model.

The findings from Study 3 highlight three important outcomes. First, replicating the previous experiments, participants who engaged in nostalgic reverie were more optimistic about their future health compared to their control counterparts. This not only supports previous work showing that nostalgic thinking can lead to feelings of optimism

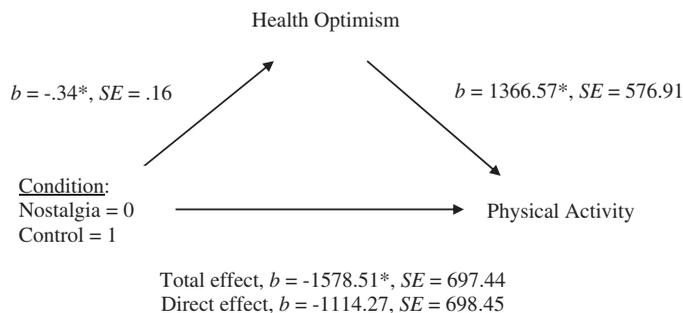


Figure 3. The indirect effect of nostalgia on physical activity through health optimism (Study 3). Notes: *Indicates significance at $p \leq .05$, **indicates significance at $p \leq .01$.

(Cheung et al., 2013), but it also demonstrates that nostalgia can replenish feelings of health optimism over the course of several days in which optimistic thinking may naturally diminish (Sweeny & Krizan, 2013). Second, whereas previous work has focused extensively on the positive psychological outcomes of nostalgia (Routledge et al., 2013; Sedikides et al., 2008), the current study provides evidence that nostalgic reverie is associated with people becoming more physically active. These findings complement prior work by demonstrating that greater feelings of optimism/health optimism are connected with behaviours that directly benefit physical well-being (Carver et al., 2010; Rasmussen et al., 2009). Finally, adding to the literature demonstrating the immediate effects of nostalgic reverie on well-being (Routledge et al.; Sedikides et al.), the present study found that repeat exposure to a nostalgia manipulation can promote health benefits over time. This is consistent with other work demonstrating how brief interventions can lead to improvements in physical performance and subjective well-being (Wicker, Coates, & Breuer, 2015). However, as the present findings suggest, nostalgia may inspire repeated engagement of exercise behaviours, making them become progressively more automatic over time.

General discussion

For many individuals, achieving and maintaining a healthier lifestyle is important for well-being and can prevent many diseases and conditions (e.g. heart disease, obesity; Woolf & Aron, 2013). However, given the rise in obesity, sedentariness and physical inactivity in the United States and elsewhere (World Health Organization, 2015), it seems especially important to identify strategies to motivate and improve people's health. For this reason, the present research examined the association between nostalgia, optimism and physical well-being. The results revealed that, in comparison to control conditions, participants who recalled a nostalgic event reported higher levels of health optimism (Studies 1–3). Additionally, the increase in optimism following the nostalgia manipulation was associated with greater health attitudes (Study 2) and increased physical activity over a two-week time period (Study 3). This work is the first, to our knowledge, to examine the overlap between nostalgia and health by suggesting that one route to physical well-being is through sentimentally recalling experiences from the past.

These findings have important implications for research on nostalgia. Whereas, previous work has focused exclusively on the psychological and social benefits of nostalgic reverie (Routledge et al., 2013; Sedikides et al., 2008), the current studies provide initial evidence that these benefits may also extend to physical health. This is potentially important as people may experience anger and frustration from an inability to lose weight after weeks of eating healthy and regular exercise. Given that nostalgic memories are often recalled during times of anxiety, boredom and sadness (Routledge et al., 2013), the current results suggest that nostalgia, through the promotion of optimistic thinking, has the potential to help individuals cope with physical adversity by being less avoidant, more engaged and, ultimately, healthier. Further, the present findings widen the scope of nostalgia's proclivity to increase feelings of optimism. Whereas, Cheung and colleagues (2013) showed that nostalgia led to greater feelings of general optimism for one's future, the present research expands on these results by identifying a form of optimistic thinking that is health specific. This is important as nostalgia may have the potential to facilitate improvement, if not success, in health domains where pessimism

might be present. Nostalgia may also counter declines in health optimism by renewing people's pursuit of health-relevant goals.

The current results also have important implications for research on optimism and health. Dispositional optimism is associated with feelings of happiness, satisfaction with life and subjective well-being, which have all been found to increase physical health and life expectancy (Diener & Chan, 2011; Gallagher, Lopez, & Pressman, 2013). The present studies help to qualify this relationship further by demonstrating that nostalgia is an important resource for individuals. By increasing health optimism through nostalgic reverie, people may help to ameliorate serious threats to their physical condition (e.g. cardiovascular disease, diabetes), as well as increase their psychological well-being (e.g. reduce stress, depression; Warburton et al., 2006). Given that the largest improvements in health often occur among non-active individuals who become physically active (Warburton et al.), nostalgia may be especially important for persons in most need of improving their physical condition. Nostalgia may further be a beneficial resource for patients coping with, and recovering from chronic or terminal illnesses, in the same way research has demonstrated optimism can (see Carver et al., 2010).

Of course, the present research is not without limitations. Most of our studies consisted of undergraduate samples. It is possible that college students, given that they are less vulnerable to physical ailments, are the most likely to be optimistic about their health. Although we were able to find that nostalgia-induced health optimism led to greater health attitudes in collegiate and general populations (mTurk; Study 2), future research would benefit from further examination of the extent to which nostalgic reflection transcends age, gender and cultural differences (Hepper et al., 2014; Wildschut et al., 2006). Additionally, there were some problems with the experimental design of the studies. First, given that we utilised Baron and Kenny's (1986) statistical approach to mediation, there is no evidence to suggest that health optimism is causally involved in the relationship between nostalgia and physical health or that it is the only mediating variable (Bullock, Green, & Ha, 2010; Fiedler, Schott, & Meiser, 2011). Studies would benefit from manipulating the mediator, such that increases in health optimism (either experimentally induced or individually measured) results in greater health attitudes and behaviour. Second, Study 3 would have benefitted from a baseline assessment of health optimism prior to any nostalgia manipulation. Doing so would have provided useful information about how optimism scores changed in response to nostalgia, in addition to examining the long-lasting effects of nostalgic reflection over time (e.g. whether health optimism returned to baseline levels within the 4–5 days between study sessions).

It is also important to identify other mediating and moderating variables. For example, nostalgia may have increased health optimism because it led people to perceive themselves as being less susceptible to infectious disease (e.g. Perceived Vulnerability to Disease Scale; Duncan, Schaller, & Park, 2009); and for individuals who experience less stress (Segerstrom, Taylor, Kemeny, & Fahey, 1998), negative affect (Segerstrom, 2001) and engage in more adaptive health behaviours (Scheier & Carver, 1992). Further, nostalgia may have promoted more optimistic feelings about one's health by increasing feelings of youthfulness (Abeyta & Routledge, 2016). Although not examined in the current studies, an interesting direction for future research would be to test whether nostalgia-induced health optimism increases physical activity by promoting a younger view of the self. With respect to moderation, given the positive association between childhood socio-economic status and optimistic thinking (Heinonen et al.,

2006), individuals who reap the most benefits from nostalgia-induced health optimism may be those who were reared in high (vs. low) income environments or have higher levels of social support (MacLeod & Conway, 2005). It would also be interesting to examine imagining ability (Kwekkeboom, 2000) as a potential moderator, with individuals who are more capable of generating nostalgic experiences reaping the most benefits on optimism and physical health.

Finally, as more and more is learned about the well-being effects of nostalgic reflection, it is important to explore how such findings extend to clinical populations. For example, 'looking back' on one's life as part of the therapeutic process (e.g. motivational interviewing; Miller & Rollnick, 2002) may result in higher well-being as patients recall nostalgic instances from their past before they started to experience relationship difficulties, substance use problems and so on. Further, the act of 'looking forward' towards a future possible self could result in better health as individuals engage in more optimistic thinking (Sheldon & Lyubomirsky, 2006). Although individuals may experience discrepancies among their past, present and future selves, several studies have found that nostalgia serves as a psychological resource for people to draw from to increase self-continuity and well-being (Sedikides, Wildschut, Routledge, & Arndt, 2015). Thus, recruiting sentimental memories may be a way to promote proactive health behaviours among individuals who are struggling with deficiencies in their physical condition.

Despite these limitations, the current research has important implications for physical health. Given that many individuals struggle to achieve and maintain a healthy lifestyle, it seems especially important to find effective ways to improve one's physical condition. As the present research suggests, nostalgia may serve as a meaningful health intervention. For example, counsellors, dieticians, personal trainers and even individuals themselves, may be able to utilise nostalgia as a resource to help combat sedentariness, malnutrition and health-risk behaviours while further incentivising those who primarily seek to maintain a healthier lifestyle. Further, by fostering more optimistic feelings about one's physical health, nostalgia may help to thwart goal-stifling pessimism (Carver et al., 2010), replenish optimism that may diminish over time (Sweeny & Krizan, 2013) and help those coping with distress (e.g. recent breast cancer diagnosis, episodes of depression; Antoni et al., 2001; Seligman, Schulman, & Tryon, 2007). Overall, when it comes to the difficult task of staying true to a New Year's resolution, it appears that one may benefit from looking back on the past, as well as, looking forward to the future.

Acknowledgements

We wish to thank Kiely Alfieri and Christian Sullivan for their help with data collection.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by Science and Engineering Research Center (SERC) grant and an Initiative for Oncology Research (INFOR) grant from Texas Christian University.

Notes

1. In all studies, there were no main effects of gender, $F_s \leq 3.05$, $ps \geq .09$; additionally, participants' gender did not moderate any of the obtained results, $F_s \leq 3.68$, $ps \geq .06$.
2. Participants were asked whether they 'read and answered all of the questions carefully' on a seven-point scale (1 = *I rushed through the study and wasn't always careful in my responses*; 7 = *I read all of the questions carefully and took my time with the study*). To encourage honesty, individuals were told that their response to this question would have no impact on their participation credit. Persons were dropped if they indicated a response of '2' or below on this question.
3. Following previous research (Carnelley & Rowe, 2010), we analysed the content of the written narratives in Study 1 to assess for the frequency of nostalgic reverie. The results revealed that participants who wrote about a nostalgic event had a greater proportion of nostalgia-related words in their narratives ($M = 6.73$, $SD = 3.13$) than those who wrote about an ordinary event ($M = 2.25$, $SD = 2.06$), $t(103) = 8.68$, $p \leq .001$, $d = 1.69$. Given that all studies used the same nostalgia manipulation, we only performed a content analysis on participant narratives in the first experiment.
4. Study 1 participants completed a general measure of optimism (Revised Life Orientation Test; Scheier, Carver, & Bridges, 1994) at the start of the experiment prior to the independent and dependent variables. Further, participants also completed a measure of positive affect (PANAS; Watson, Clark, & Tellegen, 1988) following the nostalgia manipulation. Separate analysis of covariance tests were performed to rule out the possibility that optimism and positive affect influenced attitudes towards people's physical health. The results revealed that baseline optimism and state-level positive affect were not significant covariates, $F_s \leq 3.28$, $ps \geq .07$, and did not influence the effect of the nostalgia manipulation on health optimism, $F_s \geq 4.58$, $ps \leq .04$.
5. Given the longitudinal nature of Study 3 (three time points in two-weeks), preliminary analyses were conducted to assess whether repeat exposure to the nostalgia manipulation increased health optimism and physical activity over time. To do this, two longitudinal growth models using Hierarchical Linear Modeling Version 7 software were conducted. Neither growth model was significant, $t_s \leq 1.00$, $ps \geq .32$, suggesting that although scores remained consistent, there was not enough variability in scores over time to warrant further longitudinal analyses. Given this lack of change in health optimism and physical activity, the three time points for each measure were averaged together to create composite health optimism and physical activity scores (see Kochanska, Murray, & Harlan, 2000 for similar procedures).
6. Analyses revealed no significant interaction between participant type (i.e. mTurk workers vs. students) and the nostalgia manipulation on health optimism and health attitude scores, $F_s \leq .18$, $ps \geq .68$.
7. We ran two mediation analyses examining whether Time 1 health optimism scores predicted Time 2 health behaviour (Model 1), and whether Time 1 and Time 2 health optimism scores (averaged together) predicted Time 3 health behaviour (Model 2). Both mediational models were significant (95% confidence interval for the indirect effect Model 1: -1560.80 to -12.07 ; Model 2 indirect effect: -1640.69 to -10.38) in the hypothesised direction. We continue to report our aggregated results to be consistent with previous research which has utilised similar procedures (Kochanska et al., 2000).

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