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Meaningful Endings and Mixed Emotions: The Double-Edged Sword of Reminiscence on Good Times

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Abstract

Meaningful endings lead people to experience mixed emotions, but it is unclear why. We hypothesized that it is in part because meaningful endings lead people to reminisce on good times. In Study 1, college students who took part in our study on their graduation day (vs. a typical day) reported having spent more time that day reminiscing on good times. Moreover, reminiscence on good times partially mediated the effect of graduation on happiness, sadness, and mixed emotions. In Study 2, we asked undergraduates to reminisce on good (vs. ordinary) times from high school and found that reminiscence on good times elicited happiness, sadness, and mixed emotions. In Study 3, we found that reminiscing on good times that were not (vs. were) repeatable elicited especially intense sadness and mixed emotions. Taken together, results indicate that reminiscing on good times, especially good times gone, elicits mixed emotions and that these emotional consequences help explain why meaningful endings elicit mixed emotions.

Keywords

reminiscence; happiness; sadness; mixed emotions; nostalgia

> Parting is such sweet sorrow.
>
> —William Shakespeare, *Romeo & Juliet*

Our lives are broken into chapters, all of which come to an end. Graduations, farewell banquets, and other endings can be meaningful, and meaningful events tend to elicit emotions (Frijda, 1988). Characterizing which emotions are elicited by some meaningful events can be fairly straightforward: victory brings joy (e.g., Lazarus, 1991), and bereavement brings grief (e.g., Bonanno & Kaltman, 2001), but Juliet's apparently

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contradictory emotional reactions to the end of her evening with Romeo suggest that characterizing emotional reactions to meaningful endings is a bigger challenge. Indeed, college students are more likely to report mixed emotions of happiness and sadness on the day that they move out of their freshmen dorm and on their graduation day than on typical days (Larsen et al., 2001). What is not yet entirely clear is why endings elicit mixed emotions. Our goal is to investigate whether meaningful endings elicit mixed emotions in part because they lead people to reminisce on good times lost.[1]

Mixed Emotions

Initial work on mixed emotional reactions to endings took place in the context of an ongoing debate about the structure of affect. Most models of the structure of affect allow for the co-occurrence of positive and negative emotions. Watson and Tellegen (1985; Watson et al., 1999) influential two-dimensional model, for instance, contends that high-arousal positive and high-arousal negative affective states are largely uncorrelated and can therefore co-occur (see Watson & Stanton, 2017). For instance, pornography can elicit mixed emotions of excitement and stress (Staley & Prause, 2013), and off-color jokes can elicit mixed emotions of disgust and amusement (Hemenover & Schimmack, 2007; McGraw & Warren, 2010; for reviews, see Larsen & McGraw, 2014 and Larsen et al., 2017).

Models disagree about whether there are constraints on the types of opposite-valence emotions that can co-occur. According to Russell's (1980; Russell & Barrett, 1999) circumplex model, happiness and sadness should be mutually exclusive because they anchor the two ends of a bipolar valence dimension (Russell, 2017; Russell & Carroll, 1999). In contrast, Cacioppo and Berntson (1994; Cacioppo et al., 1999) evaluative space model, which highlights the separability of positive and negative affective processes, allows for the co-occurrence of any opposite-valence emotions, including happiness and sadness.

Larsen et al. (2001) conducted three tests of these competing hypotheses about whether people can feel happy and sad at the same time. They did not have any guiding hypotheses as to when people would experience such mixed emotions; they merely sought out circumstances in which they suspected people might do so. In one study, they found that moviegoers were more likely to report mixed emotions of happiness and sadness after (as opposed to before) watching the tragicomic film, *Life Is Beautiful* (Benigni, 1997). Aside from its role in providing strong tests of competing hypotheses, the evidence that *Life Is Beautiful* elicited mixed emotions was no more inherently interesting than evidence that tragedies elicit sadness and comedies elicit happiness. It is a tragicomedy, after all. In two follow-up studies, they speculated about circumstances in which college students might experience mixed emotions. They speculated (and found) that The Ohio State University students were more likely to report mixed emotions of happiness and sadness upon moving out of their residence halls than on a typical day. They also speculated (and found) that University of Chicago students were more likely to report mixed emotions on their graduation day than during a typical day on campus.

[1]Romeo and Juliet's first parting lasted a few hours. The combined effects of a slow postal service, strong sedative, and sharp dagger made a subsequent parting considerably more permanent.

Time, Endings, and Mixed Emotions

Larsen et al. (2001) offered little but speculation as to why move-out day and graduation day might elicit mixed emotions. Just as a tragicomedy blends tragedy and comedy, it might simply be that these events contain a potent mix of pleasant aspects (e.g., a sense of accomplishment; the beginning of summer) and unpleasant aspects (e.g., saying goodbye to friends). Ersner-Hershfield et al. (2008) suggested that there is something more. They suggested that events such as move-out day and graduation day elicit mixed emotions because they represent endings. Ersner-Hershfield et al.'s work was motivated by Carstensen's (1993, 2006) socioemotional selectivity theory (SST). According to SST, in life course context endings tacitly activate awareness of mortality (Carstensen, 1993, 1995, 2006). SST has clear implications for those approaching the end of their lives, but the posited mechanism concerns endings more generally. Life chapters (e.g., a student's freshman year or college career), moves to a new home or city, marriages, and childbirths all delineate progression through lives that ultimately end. Ersner- Hershfield et al. asked participants to imagine being in a meaningful location several times. On one occasion, they attempted to produce a sense of ending by asking people to imagine being in that location for the last time. People felt sad after the last-time trial, which is consistent with Lazarus's (1991) notion that sadness is elicited by irrevocable loss. This sadness may have reflected a poignant sense of what Duncker (1941) referred to as "no-longer-having" (p. 418).

Given that happiness and sadness tend to be mutually exclusive (Russell & Carroll, 1999), one might expect the sadness occasioned by the last-time trial to preclude people from experiencing happiness. It did not. People did feel somewhat less happy after the last-time trial than after the other trials, but they were still happier than sad. Thus, the sense of poignancy associated with endings can entail mixed emotions of happiness and sadness. In another experiment, Ersner-Hershfield et al. (2008) reminded one group of Stanford graduates on their graduation day that "today is the last day that you will be a student at Stanford" (p. 164). Despite the reminder, these graduates subsequently reported feeling just as happy as those in a control condition. At the same time, they reported more intense sadness and mixed emotions. Thus, making endings salient can heighten mixed emotions.

The Role of Reminiscence on Good Times

The idea that endings elicit sadness because they entail a sense of "no-longer-having" makes sense, but it is not entirely clear why endings would produce poignant mixed emotions. Ersner-Hershfield et al. (2008) suggested that such endings such as graduation signify a sense of progress. Another study of endings (Kurtz, 2008) points to the possibility that reminiscence on bygone times might also play a role. In the few weeks leading up to their graduation, she found that a group of seniors who had been induced to construe their graduation as close in time savored their final days of college more than a group who had been induced to construe it as distant in time. Her induction made time seem scarcer. Students responded by valuing that time, just as we might savor the last chocolate in a box of chocolates (O'Brien & Ellsworth, 2012). Of course, what we often really want is more chocolate. When we run out of chocolate, we can simply buy more. Time is different. People who are approaching endings cannot simply buy more. In lieu of buying time, perhaps they

turn instead to a place where time is plentiful: the past. In other words, perhaps people deal with endings not only by savoring what little time they have left (Kurtz, 2008) but by reminiscing upon and savoring times gone by.

Our initial speculation about how reminisce might elicit mixed emotions in the context of endings was quite simple (and, in hind-sight, simplistic). We suspected that endings would lead people to reminisce on good times and bad, that memories of good times would produce happiness, and that memories of bad times would produce sadness. In combination, these processes might yield mixed emotions. We explored this possibility with a preliminary study in which, we surveyed Stanford students (n = 296) on their graduation day or during a typical day on campus. In addition to asking them to report their emotions, we also asked them to indicate the percentage of time they had spent that day thinking about their time at Stanford. Graduates felt more mixed emotions of happiness and sadness than nongraduates, but there was little evidence that graduates spent more time reminiscing on the past (M = 28%) than did nongraduates (M = 22%, p = .12).

In making sense of this null finding, we developed a more nuanced hypothesis about the effect of endings on reminiscence. Scarce *goods* (e.g., good times) become more valuable, but scarce *bads* (e.g., pollution, toxic waste) do not. We savor good times. We therefore speculated that endings might lead people to selectively reminisce upon good times and the sense of "no-longer-having" those good times is one source of sadness. At the same time, recalling pleasant memories is generally a source of positive emotions. A recent meta-analysis comparing five classes of emotion inductions indicated that the second most powerful way to induce happiness is to ask people to recall positive autobiographical memories (d = 1.36; Joseph et al., 2020).[2]

Taken together, these lines of reasoning suggest that the effects of endings on happiness, sadness, and mixed emotions may be mediated by reminiscence on good times. We conducted three studies to test this hypothesis. The first study again involved the paradigmatic ending: college graduation. In two follow-up studies, we set aside endings in order to directly manipulate reminiscence and isolate its effects on emotions.

Study 1

In Study 1, we asked students to report how they were feeling and how much time they had spent reminiscing that day on graduation day and on a typical day on campus. Unlike in the preliminary study, we asked them to distinguish between how much time they had spent reminiscing about good versus bad times. We expected to replicate Larsen et al. (2001) finding that graduates would experience more mixed emotions of happiness and sadness. We also expected that (a) graduates would spend more time reminiscing on good times and that (b) the effect of graduation on happiness, sadness, and mixed emotions would be mediated by reminiscence on good times. Guided by the idea that endings only increase the value of scarce goods, we did not expect graduates to spend more time reminiscing about bad times.

[2]Presenting people with pleasant pictures is the most powerful induction. Less powerful inductions include watching pleasant films, reading pleasant statements (Velten, 1968), and listening to pleasant music.

We also considered the possibility that graduates might feel happy not so much as a function of reflecting upon good times gone so much as reflecting upon future good times. To address that possibility, we also asked participants to indicate how much time they spent reflecting upon good things they hoped would happen and bad things they feared would happen in the future.

Method

Stanford University students participated (N = 321; 47% women, 51% men, 2% declined to report) in our study, which was approved by Stanford's Institutional Review Board (IRB). Experimenters approached students on either their own graduation day or on a typical day during the Spring 2010 quarter. Those who agreed to participate completed a brief survey in which they indicated whether they currently felt a variety of emotions, including happiness and sadness (e.g., Are you happy? ____Yes ____No).[3] If they checked *yes*, they then reported the extent to which they felt each emotion on a scale from 1 (*slightly*) to 7 (*extremely*). After reporting their emotions, participants were asked to indicate the percentage of time they had spent that day thinking about: (a) good things they had experienced during their time at Stanford, (b) bad things they had experienced during their time at Stanford, (c) good things they hoped would happen to them after graduation, and (d) bad things they feared would happen to them after graduation. To encourage participants to report on how much they had reflected on the fairly distant past and future, we instructed them to ignore things that had happened within the last 7 days or would happen within the next 7 days. They were also told that the sum of their reflection judgments should not exceed 100%.

Data were removed from participants who failed to follow instructions either by neglecting to complete ≥2 of the initial dichotomous questions (n = 14; 4.4%) or by reporting having spent >100% of their time reflecting on the past and future (n = 59; 18.4%). The final sample contained data from 254 participants (79.1% of the original sample), of whom 131 (48.4%) completed the survey on their graduation day. (Note that sample size was not specified a priori. We recruited as many participants as possible on graduation day, then recruited a comparable number for the typical day group.)

Results

Graduates' and nongraduates' data from each of the dependent measures are shown in Table 1. Mixed emotions were indexed with the MIN statistic (Kaplan, 1972; Larsen et al., 2004; Schimmack, 2001), which simply consists of taking the smaller of the happiness and sadness ratings.[4] Many of the distributions were severely skewed and had a mode of 0, so

[3]The other emotions were excited, bored, hopeful, afraid, proud, bittersweet, and nostalgic. For exploratory purposes, graduates were asked to indicate how much they enjoyed their time at Stanford on a 5-point scale ranging from 1 (*awful*) to 5 (*great*), and all participants were asked to indicate how long ago it seemed that they had arrived at Stanford. Results involving these variables are discussed elsewhere.

[4]Other measures of mixed emotions are available, but MIN is most appropriate measure for our study. In the attitudinal ambivalence literature, felt ambivalence is typically operationalized with similarity-intensity scores (Thompson et al., 1995), which are computed as 4 × MIN (positivity, negativity) – MAX (positivity, negativity). Similarity-intensity scores have also been used to index mixed emotions (e.g., Kung & Chao, 2018). We favor MIN for two reasons. First, similarity-intensity scores are largely a function of MIN scores, so they are highly correlated with each other. In Study 1, the correlation was .95. MIN scores and SIM scores are virtually identical, but MIN scores are simpler. Second, it is not clear that similarity-intensity scores offer greater construct validity

they could not be transformed into a normal distribution. We therefore used Mann–Whitney *U* tests (the nonparametric equivalent to between-subjects *t* tests) to determine whether graduates and nongraduates differed on each measure. As shown in Table 1, graduates felt both happier and sadder than nongraduates. Replicating the results of Larsen et al. (2001), they also experienced more intense mixed emotions of happiness and sadness. As anticipated, graduates selectively spent more time than nongraduates reminiscing about past good times (see Table 1). The Mann–Whitney was not significant, but there was a tendency for graduates to spend less time reminiscing about past bad times than nongraduates. Graduates did not spend more time thinking about future good times, but they did spend less time thinking about future bad times.

Three multiple mediation analyses (PROCESS, Model 4; Hayes, 2013) were conducted to investigate whether reminiscence on good times past helps explain why graduates experienced more happiness, more sadness, and more mixed emotions of happiness and sadness.[5] As shown in Figure 1, the mediational analyses indicated that reminiscence on good times partially mediated the effect of graduation on both happiness and sadness. It is therefore not surprising that, as anticipated, it also partially mediated the effect of graduation on mixed emotions. Even though the Mann–Whitney test reported above gave little indication that graduates spent less time reminiscing on past times ($p = .075$), the bootstrapping analyses underlying the mediation analyses indicated that graduates did spend less time reminiscing on bad times and that reminiscence on bad times partially mediated the effect of graduation on happiness. They also indicated that reflecting on future bad times partially mediated effects of graduation on both sadness and mixed emotions.

Discussion

We had hypothesized graduation day elicits mixed emotions in part because endings lead people to think about good times past and that thinking about such times would elicit both happiness and sadness. Results were consistent with our hypothesis. Not only did students report more happiness, sadness, and mixed emotions on graduation day than on a typical day, they also reported that they had spent more time reminiscing on good times. Moreover, mediational analyses indicated that reminiscing on good times mediated the effects of graduation on happiness, sadness, and mixed emotions. The very same introspection that made graduates happy also made them sad.

Graduation was also associated with other types of mental time travel. We did not expect graduates to spend more time reminiscing on bad times, and there was some indication that they spent less time doing so. There was also evidence that reminiscence on bad times

when it comes to measuring mixed emotions. Holding MIN constant, someone with a higher MAX score will have a smaller similarity-intensity score than someone with a lower MAX score. It is not clear, however, that we should think of the person with a higher MAX score as experiencing less intense mixed emotions. If anything, we might think of that person as experiencing more intense mixed emotions because the sum of their emotion ratings is higher. MIN scores are most appropriate for our data but may not always be most appropriate. Whereas we gathered data from each participant on a single occasion, researchers frequently gather data from each participant on many occasions. In such studies (e.g., experience sampling studies), individual differences in acquiescence and other response biases can be confounded with more conceptually interesting individual differences. Several alternatives to simple MIN scores have been proposed to control for response biases (e.g., Grossmann et al., 2016; Riediger et al., 2009; for a comparison, see Larsen et al., 2017).

[5]Note that PROCESS's bootstrapping approach makes its confidence intervals robust to violations of normality (A. Montoya, personal communication, February 1, 2021).

partially mediated the effect of graduation on happiness. This may help explain why our preliminary study did not yield evidence that reminiscence mediated the effect of graduation on happiness. By failing to ask the preliminary study's participants to distinguish between how much time they had spent reminiscing on good versus bad times, we were unable to distinguish between countervailing effects of graduation on reminiscence on good versus bad times. There was also evidence that graduates spent more time reflecting upon future bad times and that such reflection also helped explain why graduates felt more sadness and more mixed emotions. In sum, one reason that college graduation leads to such complex patterns of emotions is because it leads to complex patterns of mental time travel.

Study 2

According to our conceptual framework and the mediational results of Study 1, reminiscence on good times should elicit mixed emotions even when people are not amid an ending. In the remaining pair of studies, we set aside endings and focus on the effects of reminiscence on emotions. Whereas we measured reminiscence in Study 1, we manipulated reminiscence in Study 2 (and Study 3). We did so for the following two reasons.

First, even though mediational analyses indicated that reminiscence mediated the effects of graduation on emotions, the fact that we did not manipulate reminiscence makes it difficult to definitively conclude that reminiscence affected emotions. Other mechanisms may have yielded the relationships we observed between graduation, reminiscence, and emotions. One possibility involves affect infusion, whereby the experience of positive and negative emotions affects people's memories for positive and negative events (Forgas, 1995). By this account, graduation-induced happiness prompted reminiscence on good times. It is also possible that graduates reminisced on good times in hopes of maintaining their positive emotions and repairing (i.e., reducing) their negative emotions (see Josephson et al., 1996). We therefore manipulated reminiscence in order to draw firmer conclusions about whether reminiscence elicits mixed emotions.

We also manipulated reminiscence in Study 2 because people may not be particularly good at estimating how much they have reflected on the past and the future. Suggestive evidence comes from the finding that 18% of the Study 1 participants reported having spent more than 100% of their time in such reflection. Manipulating reminiscence overcame the limitations of measuring it.

In brief, we asked college students to recall good and neutral times from high school. After each recollection, they reported how happy and sad they felt. We predicted that recalling good times would elicit more happiness, sadness, and mixed emotions. If reminiscence on good times mediated the effects of meaningful endings on happiness, sadness, and mixed emotions in Study 1, simply having people think about good times gone should have those same emotional consequences even when they are not amid an ending. Thus, we made no mention of endings in the prompts.

Method

Participants—We used G*Power 3.1 (Faul et al., 2007) to conduct a power analysis for Wilcoxon signed-rank tests. Assuming an effect size of $d = .5$ (i.e., $r = .24$), the power analysis indicated that 100 participants would yield power >.90. We therefore preregistered a sample size of approximately 100 but intended to collect data from approximately 115 participants in case we needed to exclude the data from some participants. We ultimately recruited 135 University of Tennessee undergraduates (37% women, 67% men), who took part in exchange for course credit. Data from two participants who were unable to come up with a neutral memory were discarded, leaving a final sample size of 133.

Procedure—The experiment was approved by the University of Tennessee's IRB and conducted online. Participants were informed that they were going to be asked to remember two events from high school: a meaningful, enjoyable experience and a neutral experience (counterbalanced).[6] Participants were then asked to describe each of these experiences (e.g., "Share details about what happened, who you were with, and why the experience was neutral [that is, neither enjoyable nor unenjoyable]"). After each recollection, participants rated how they felt right now with 6-point scales ranging from 0 (*not at all*) to 5 (*extremely*). Happiness was measured with three items (cheerful, happy, joyful; $\alpha_{neutral} = .93$, $\alpha_{enjoyable} = .92$), as was sadness (mournful, sad, sorrowful; $\alpha_{neutral} = .85$, $\alpha_{enjoyable} = .86$). Mixed emotions were operationalized as MIN (e.g., happiness, sadness).

Results

To determine how recalling meaningful, enjoyable memories versus neutral memories influenced participants' emotions, we submitted happiness, sadness, and mixed emotions data to separate Wilcoxon tests (the nonparametric equivalent of the within-subjects *t* test). Consistent with past research (e.g., Joseph et al., 2020), people felt happier after recalling enjoyable events than neutral events (see Table 2). Nonetheless, they also felt sadder and more mixed emotions. Whereas the Study 1 mediational analyses suggested that reminiscence on good times influenced graduates' emotions, Study 2's experimental approach provides more compelling evidence that reminiscence on good times plays a causal role in making people feel happier, sadder, and more mixed emotions.

Study 3

We have speculated that endings lead to sadness and mixed emotions because endings lead us to reminisce on good times gone (i.e., experiences one will never have again). Study 2 demonstrated that reminiscence elicited sadness and mixed emotions, but it is not clear whether participants reminisced about good times from high school that are truly gone. They may have reminisced about experiences that they are likely to have again in years to come.

In Study 3, we investigated whether reminiscence on good times gone is especially likely to elicit sadness and mixed emotions. We did so by asking participants to recall two enjoyable events from high school, one that was not repeatable and another that was. In a similar

[6]Pilot testing indicated that explaining to participants what we meant by neutral experiences was challenging. See the online supplemental materials for the Study 2 instructions.

study, Ersner-Hershfield et al. (2008) found that participants reported more sadness and more mixed emotions when asked to imagine being in a meaningful location for the last time. Similarly, we expected recalling nonrepeatable enjoyable events to elicit more sadness and mixed emotions than recalling repeatable enjoyable events.

Method

Participants—We used G*Power 3.1 to conduct a power analysis for Wilcoxon signed-rank tests. Assuming an effect size of $d = .3$ (i.e., $r = .13$), the power analysis indicated that we needed 125 participants to achieve power of .90. We set a target sample size of 125 but intended to collect data from 130 participants in case data from some participants needed to be excluded. We ultimately recruited 124 University of Tennessee undergraduates (34% women, 65% men, 1% transgender men), who took part in the experiment in exchange for course credit. Data from one participant who was unable to come up with a neutral memory were discarded, leaving a final sample size of 123.

Procedure—The experiment was approved by the University of Tennessee's IRB and its procedure was identical to that of Study 2 with the exception that participants were asked to come up with three high school memories. In addition to coming up with a neutral experience, they were asked to come up with one meaningful, enjoyable experience that was repeatable (i.e., an "experience for which there is a reasonably good chance that you will have a similar experience in the future") and another that was nonrepeatable (i.e., an "experience that is unlike any experience you will have in the future"). The items from Study 2 were again used to index happiness (αs $\geq$.90) and sadness (αs $\geq$ .66).

Results

We submitted happiness, sadness, and mixed emotions data to separate Friedman tests (the nonparametric equivalent to one-way within-subjects analyses of variance), all of which were significant (see Table 3). Follow-up Wilcoxon tests indicated that recalling nonrepeatable enjoyable experiences elicited more happiness than did neutral experiences ($Z = 9.25$, $p < .001$, $r = .83$, 95% CI [2.50, 3.17]), as did recalling nonrepeatable enjoyable experiences ($Z = 9.34$, $p < .001$, $r = .84$, 95% CI [2.50, 3.00]). As predicted, recalling nonrepeatable enjoyable experiences elicited more sadness than did recalling both neutral experiences ($Z = 3.18$, $p = .001$, $r = .29$, 95% CI [.17, .83]) and repeatable enjoyable experiences ($Z = 2.56$, $p = .005$, $r = .23$, 95% CI [.00, .50]).[7] Also as predicted, recalling nonrepeatable enjoyable experiences elicited more mixed emotions than did recalling both neutral experiences ($Z = 4.19$, $p < .001$, $r = .38$, 95% CI [.33, .83]) and repeatable enjoyable experiences ($Z = 1.99$, $p = .02$, $r = .18$, 95% CI [.00, .50]). In addition, participants also felt more mixed emotions after recalling repeatable enjoyable experiences than neutral experiences ($Z = 3.22$, $p = .001$, $r = .29$, 95% CI [.33, .50]).

[7]Somewhat unexpectedly, recalling repeatable enjoyable experiences did not elicit more sadness than did recalling neutral experiences ($Z = 0.94$, $p = .17$, $r = .08$, 95% CI [0.00, 0.50]).

Discussion

In sum, reminiscing about good times that cannot (vs. can) be repeated elicited more sadness and mixed emotions. We do not know what thoughts crossed the Ersner-Hershfield et al. (2008) participants' minds when they imagined being in meaningful locations for the final time, but our results allow us to speculate that they spent time reminiscing about good times spent in those locations.

General Discussion

We investigated whether meaningful endings elicit mixed emotions at least in part because they prompt people to reminisce on good times. In Study 1, students reported having spent more time reminiscing on good times on their graduation day than on a typical day. Moreover, reminiscence on good times mediated effects of graduation on happiness, sadness, and mixed emotions. In Study 2, students felt more happiness, sadness, and mixed emotions after reminiscing about good (vs. neutral) times. In Study 3, students felt more sadness and mixed emotions after reminiscing about good times that could not (vs. could) be repeated.

These results highlight both our remarkable ability to engage in mental time travel and the limits of that ability. The Study 1 graduates could delve into past good times well enough to reexperience the happiness associated with those good times. Yet they were grounded in the present well enough to experience the sadness that comes from the recognition that those times are gone. The Study 3 results tell a similar story. Reminiscing on good times from high school that could not be repeated elicited more sadness and mixed emotions than reminiscence on experiences that could be repeated.

Kahneman (2011) has distinguished between the remembering and experiencing selves. According to his own introspection, "I am my remembering self, and the experiencing self, who does my living, is like a stranger to me" (p. 390). Our results suggest that the experiencing self does not need to be such a stranger. When we reminisce upon good times gone, it is the remembering self who feels happy, it is the experiencing self who feels sad, and it is we who feel a poignant combination of both.

Beyond Graduation

Study 1 focused on one specific ending: graduation day. Our results do not imply that reminiscence on good times mediates effects of less paradigmatic meaningful endings on poignant mixed emotions, but we suspect that it does. Consider how prominently reminiscence figures into ceremonies associated with endings. Ringing in the new year largely entails remembering the old year. Going-away and retirement parties feature old stories, photos, and videos and funerals are aptly known as *memorials*. Reminiscence is essentially on the program. Moreover, given that our simple manipulations of reminiscence (in Studies 2 and 3) are powerful enough to elicit mixed emotions, it seems very likely that reminiscence on good times in the context of going-away parties, retirement parties, funerals, and a wide range of other contexts will also do so.

Why Do Endings Prompt Reminiscence?

We speculated that scarcity of time helps explain why endings lead people to reminisce on good times. By this account, it is the scarcity of future time that leads people to reminisce on the past. There are other possibilities, one of which involves mindfulness. At first blush, the Study 1 graduates did not appear especially mindful because they spent much of their day reminiscing on the past. As novelist Garth Stein (2008) put it, “To remember is to disengage from the present” (p. 13). Rather than savoring their last day of college, they may have squandered it by yearning for an unrecoverable past. From another perspective, however, graduates may have been quite mindful. Routledge et al. (2011) demonstrated in their work on the benefits of nostalgia that “the past makes the present meaningful” (p. 638), but we can only make the past meaningful if we are mindful of it.

Reminiscing may also foster *self-continuity*, which refers to one’s sense of being the same over time amid external changes (Bluck & Liao, 2013; Liao et al., 2016; see also, Webster, 2003). Individuals with low self-concept clarity spend more time reminiscing, possibly in hopes of achieving self-continuity (Bluck & Alea, 2008). In addition, nostalgia has been shown to help people maintain self-continuity in the face of events that threaten it (Sedikides et al., 2015). Endings presumably represent threats to self-continuity because they can disrupt the social identities and networks that anchor the self-concept. As such, reminiscence amid endings might help people continue to be who they are as they pass from one life chapter to the next.

Reminiscence on Bad Times

Though we focused on reminiscence on good times in all three studies, we also measured reminiscence on bad times in Study 1. Guided by the idea that endings only increase the value of scarce goods, we did not expect graduates to spend more time reminiscing about bad times. Bootstrapping analyses (but not a Mann–Whitney test) indicated that graduates spent less time reminiscing on bad times and that reminiscence on bad times partially mediated the positive effect of graduation on happiness. In the preceding text, we discussed the possibility that graduates avoided reminiscence on bad times to maintain their happiness. To the degree that reminiscence serves meaning-making and self-continuity functions, there may be occasions in which endings do prompt people to reminisce on bad times. After all, bad times can be just as meaningful and important to the self-concept, if not more so, than good times.

We suspect that people are more likely to reminiscence on bad times at the end of unpleasant, as opposed to pleasant, life chapters. In addition, such reminiscence on bad times might also elicit mixed emotions, albeit mixed emotions involving not so much happiness as relief (because the bad times are gone) and perhaps pride (because the bad times have been endured). According to Larsen et al. (2003) coactivation model of healthy coping, mixed emotions can be beneficial. When asked to write about traumatic events from the past, for instance, some evidence indicates that people who write about a combination of positive and negative emotions show better health outcomes. Perhaps there are occasions in which reminiscence on bad times might also elicit mixed emotions that contribute to healthy coping. We leave such questions to future research.

A Lifespan Perspective

SST deals both with the sense of time as it relates to endings of life chapters and the end of life itself. The processes we have documented may shed light on age-related changes in mixed emotions. In the laboratory, endings produce a range of positivity effects (e.g., Barber et al., 2016; Mather & Carstensen, 2005). Older adults reliably show positivity effects (Reed & Carstensen, 2012). Tassone et al. (2019) investigated people's emotional reactions to reminiscing about major life regrets, as well as regrets from the past year. When dwelling upon major life regrets, older adults experienced less intense negative affect than younger adults did. When dwelling upon regrets from the past year, older adults experienced both less intense negative affect and more intense positive affect than younger adults. Older adults recall their childhoods as having been more pleasant than do younger adults (Field, 1981). In addition, a sample of nuns who were surveyed in 1987 and again in 2001 recalled having higher physical and emotional well-being in 2001 than they had actually reported in 1987 (Kennedy et al., 2004). If older adults spend more time reminiscing upon good times than younger adults do, our findings suggest that they should also experience mixed emotions more frequently. In samples comprising some 16,000 American adults, Schneider and Stone (2015) observed precisely that. In addition, the negative correlation between positive and negative affect weakens with age (Carstensen et al., 2011; Schneider & Stone, 2015). Though the relationship between age and mixed emotions is not yet entirely clear (cf. Riediger et al., 2009, 2014, found that older German adults experienced mixed emotions less often than their younger counterparts), our results point to a connection between positivity effects in memory and the experience of mixed emotions.

Implications for the Structure of Effect

Early studies of emotional reactions to endings took place in the context of a debate about whether people can feel happy and sad at the same time (Larsen et al., 2001; Russell & Carroll, 1999). The Larsen et al. (2001) initial evidence for mixed emotions was not conclusive, but a sizable literature on mixed emotions has since developed (Larsen, 2017b). It may never be clear whether people can feel happy and sad at the exact same moment in time (e.g., Barrett & Bliss-Moreau, 2009; Larsen, 2017a), but meta-analyses indicate that a range of stimuli can elicit a range of mixed emotions (Berrios et al., 2015; see also, Larsen & McGraw, 2014). At the same time, the fact that most of this research involves heavy-handed, laboratory-based emotion inductions (e.g., films, music, and advertisements) underscores Larsen et al. (2001) suggestion that mixed emotions are rare. In the world outside the laboratory, it is not every day that people move out of a dorm, graduate from college, experience some other meaningful ending, or choose to watch tragicomic films. Our results suggest that at least one commonplace activity has the potential to elicit mixed emotions. Study 1 indicates that people spontaneously spend a fair amount of time thinking about the past, even during typical days, and all three studies indicate that simply thinking about good times from the past can elicit mixed emotions. Perhaps mixed emotions may not be quite as rare as Larsen et al. (2001) suspected.

Our conceptual framework might make our results seem obvious, but there might also be something counterintuitive about them. After all, Studies 2 and 3 revealed that a technique that has long been known to reliably induce happiness (i.e., positive autobiographical

memory recall) can also induce sadness. Earlier findings indicate that the use of unipolar scales can reveal that seemingly neutral events can elicit mixed emotions. Norris and Larsen (2020), for instance, had participants play a series of games in which they frequently won points, frequently lost points, and occasionally got nothing (i.e., received the status quo). Nothing happened in the status quo trials, so we might expect them to evoke no emotions. In contrast, Norris and Larsen found that the status quo trials elicited mixed emotions. In some contexts, then, the status quo can represent a bittersweet nothing (Norris & Larsen, 2020). Just as Norris and Larsen's findings indicate that seemingly neutral events can elicit mixed emotions, our findings indicate that seemingly exclusively pleasant events (e.g., positive autobiographical memory) might also elicit mixed emotions. Such results underscore the more nuanced understanding of affective processes that can come from replacing bipolar measures of valence with separate unipolar measures of positive and negative affect (Cacioppo & Berntson, 1994).

From Feeling to Action

Marketers know the value of reminiscence. They often craft advertisements designed to elicit nostalgia in hopes of making products more appealing (Brown et al., 2003). People may seek opportunities to reminisce when endings approach, thereby making nostalgic advertisements especially effective. Zhao et al. (2014) cautioned that nostalgia's unpleasant aspects can undermine nostalgic advertisements' effectiveness, but may have missed the point. The sorrow induced by nostalgic purchases may be a sort of sweet sorrow that turns mere consumer experiences into rich, meaningful human experiences, experiences that are inextricably linked to the passage of time.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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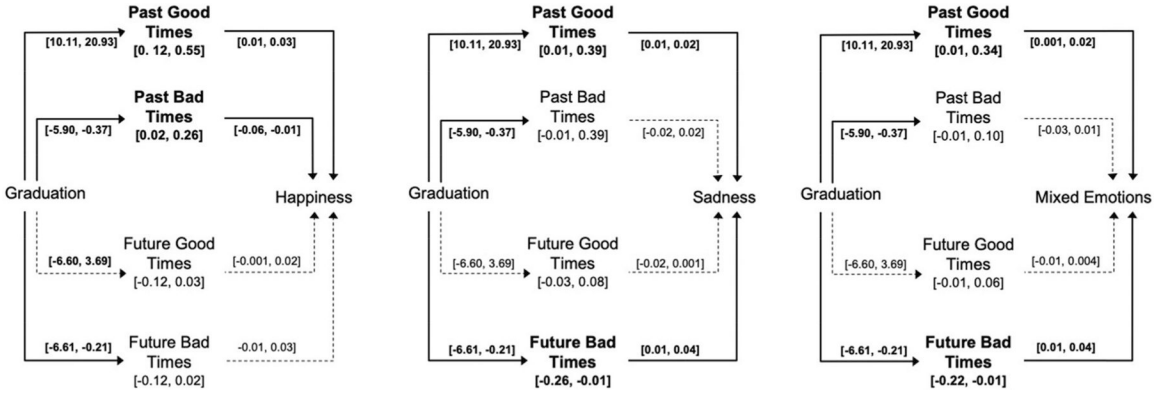

Figure 1. Study 1: Results of Multiple Mediation Regressions

Note. Left panels: Results predicting happiness. Middle panels: Results predicting sadness. Right panels: Results predicting mixed emotions of happiness and sadness which are operationalized as the minimum of the happiness and sadness ratings (i.e., MIN [happiness, sadness]). Analyses were conducted with Process 2.15 (Model 4; 5,000 bootstraps). Solid lines denote effects with confidence intervals that did not contain 0. Boldface type indicates mediators with confidence intervals that did not contain 0.

Table 1

Emotion Ratings and Percentage of Time Spent Reflecting in Study 1's Typical Day and Graduation Day Conditions

	Typical day			Graduation day					
Measure	***N***	***M***	***SD***	***n***	***M***	***SD***	***Z***	***p***	***r***
Emotion									
Happy	131	4.30	2.04	123	4.85	1.81	1.79	.04	.11
Sad	131	0.60	1.33	123	1.61	1.94	4.83	<.001	.30
Mixed emotions	131	0.45	1.05	123	1.46	1.77	5.20	<.001	.33
Reflection									
Past good times	131	17.79	17.38	122	32.70	25.32	4.80	<.001	.30
Past bad times	129	9.58	12.78	120	6.35	8.68	−1.44	.08	−.09
Future good times	131	28.27	21.35	123	26.70	21.13	−.42	.66	−.03
Future bad times	130	11.89	13.68	118	8.50	11.59	−2.25	.01	−.14

Note. Mixed emotions are operationalized as the minimum of the happiness and sadness ratings (i.e., MIN [happiness, sadness]). Confidence intervals are not provided because R confidence intervals were nonsensical, and SPSS does not provide them. Note that all effects significant according to R were also significant according to SPSS and vice versa.

Table 2

Happiness, Sadness, and Mixed Emotions After Recalling Neutral and Enjoyable Experiences From High School in Study 2

	Neutral		Enjoyable					
Measure	***M***	***SD***	***M***	***SD***	***r***	**95% CI**	***Z***	***p***
Happy	1.08	1.16	3.52	1.23	.82	[2.33, 2.83]	9.42	<.001
Sad	0.44	0.78	0.95	1.12	.36	[0.33, 0.83]	4.15	<.001
Mixed emotions	0.35	0.70	0.89	1.07	.44	[0.50, 0.83]	5.10	<.001

Note. Mixed emotions are operationalized as the minimum of the happiness and sadness ratings (i.e., MIN [happiness, sadness]). Pearson's *r* is used to index effect size for Wilcoxon tests.

Table 3

Happiness, Sadness, and Mixed Emotions After Recalling Neutral, Repeatable Enjoyable, and Nonrepeatable Enjoyable Events in Study 3

	Neutral event		Repeatable enjoyable event		Nonrepeatable enjoyable event			
Measure	***M***	***SD***	***M***	***SD***	***M***	***SD***	$\chi^2(2)$	***p***
Happy	0.90_a	1.11	3.56_b	1.22	3.57_b	1.40	172.90	<.001
Sad	0.49_a	0.86	0.57_a	0.74	0.87_b	1.10	15.60	<.001
Mixed emotions	0.32_a	0.66	0.54_b	0.67	0.74_c	0.95	27.11	<.001

Note. Mixed emotions are operationalized as the minimum of the happiness and sadness ratings (i.e., MIN [happiness, sadness]). Means with different subscripts are significantly different at $p < .05$.