Does the Age-Related Positivity Effect in Autobiographical Recall Reflect Differences in Appraisal or Memory?

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Objectives. Two studies examined the extent to which the age-related positivity effect in autobiographical recall is the result of age differences in appraisal and memory.

Methods. In Study 1, older and younger participants reported 1 pleasant and 1 unpleasant event for 5 days. Participants attempted to recall those events a week later. In Study 2, older and younger participants imagined that positive, negative, and neutral hypothetical events had occurred either to themselves or to an acquaintance and were later asked to recall those events.

Results. In Study 1, younger adults reported a complete set of positive and negative events. Older adults reported a pleasant event each day, but 38% did not report an unpleasant event on at least 1 day. A week later, older and younger adults were equally likely to recall the events they had reported. In Study 2, older adults who imagined events happened to themselves rated events as more positive in valence than younger adults did. Older and younger adults were equally likely to remember pleasant and unpleasant events at the end of the study.

Discussion. The data suggest that the age-related positivity effect resides in the appraisal rather than the recall of autobiographical events.

Key Words: Aging—Appraisal—Autobiographical memory—Emotion—Positivity effect—Self-relevance.

Kennedy, Mather, and Carstensen (2004) used the term “positivity effect” to describe age differences in the processing of positive compared with negative information. Researchers have found that, relative to younger adults, older adults preferentially attend to and remember positive than negative stimuli in scenes, facial expressions, and word lists (Charles, Mather, & Carstensen, 2003; Fernandes, Ross, Wiegand, & Schryer, 2008; Kwon, Scheibe, Samanez-Larkin, Tsai, & Carstensen, 2009; Mather & Carstensen, 2003; Piquet, Conally, Kendl, Huot, & Corkin, 2008).

The age-related positivity effect is typically interpreted in the context of socioemotional selectivity theory (SST; Reed & Carstensen, 2012). According to SST, younger adults pursue different goals than older adults do. Younger adults, who believe that they have a long future ahead of them, focus on information seeking and novelty goals. Older adults, who perceive their future to be more limited, focus on emotionally meaningful goals.

Although the majority of researchers have examined age differences in attention and recall of emotional pictures and words, SST suggests that the age-related positivity effect should be particularly evident in autobiographical memories (Mather & Carstensen, 2005). Autobiographical experiences are highly self-relevant. According to the logic of SST, older adults should be especially motivated to process the positive over the negative details of their personal experiences in order to regulate their emotions.

There are now a growing number of studies relating aging to autobiographical memory. Older and younger adults spontaneously recall a similar number of positively themed memories (e.g., parties, holidays), but older adults recall significantly fewer negatively themed events (e.g., accidents and illnesses; Field, 1981; Schlagman, Schulz, & Kvavilashvili, 2006). As well, older adults retrospectively rate personal experiences less negatively than younger adults do (Comblain, D’Argembeau, & Van der Linden, 2005; Ready, Weinberger, & Jones, 2007; Schryer & Ross, 2012; Schlagman et al., 2006).

A few researchers have studied age differences in autobiographical memory using longitudinal designs. Field (1981) examined adults’ evaluations of their childhood at two points in time 40 years apart. Participants evaluated their childhood more positively as they got older. Kennedy and colleagues (2004) asked middle-aged and older nuns to recall personal information that they had originally reported on a questionnaire 14 years earlier. The control condition of this study is most relevant here because respondents were left to their own devices rather than instructed how to recall the past. In the control condition, older participants (aged 79–101) were more likely than middle-aged participants (aged 47–65) to recall the information more positively than they had reported originally. This age difference is consistent with research on reappraisal. As individuals age, they become more likely to implement positive reappraisal...
as a form of emotional self-regulation (Folkman, Lazarus, Pimley, & Novacek, 1987; Shiota & Levensen, 2009).

Although consistent with SST, the various autobiographical recall findings are open to at least three alternative interpretations. Older adults may spontaneously recall fewer unpleasant memories because they experienced fewer unpleasant events in their everyday lives. Relative to younger adults, older adults tend to encounter fewer situations that elicit negative emotions and stress (Birditt & Fingerman, 2005; Blanchard-Fields, Stein & Watson, 2004; Charles & Piazza, 2009; Fingerman, 1995; Stawski, Almeida, Lachman, Tun, & Rosnick, 2010). This age difference in experience reflects social roles (Rosenkotter, Garris, & Engdahl, 2001) and older adults’ greater tendency to avoid situations that provoke negative emotions (Birditt & Fingerman, 2005; Blanchard-Fields, Mienaltowski, & Seay, 2007; Blanchard-Fields et al., 2004; Luong, Charles, & Fingerman, 2011). The likelihood that older adults experience fewer unpleasant events in everyday life does not explain the positivity effect obtained in longitudinal studies (Kennedy et al., 2004) in which older participants recall information more positively (or less negatively) than they originally reported. However, it is a plausible explanation for age differences that occur when participants recall the frequency of positive and negative experiences in their lives.

It is also possible that even when older and younger adults experience a comparable number of negative events, older adults may be less likely to recall the episodes. This differential forgetting of negative episodes could occur because older and younger adults direct their cognitive resources toward different types of information. According to SST, older adults are motivated to attend to and process positive information, and younger adults are motivated to process negative information (Reed & Carstensen, 2012). This hypothesis has received compelling support from research on visual stimuli (see Reed and Carstensen, 2012, for a review).

Another possibility is that older adults initially appraise personal events more favorably than their younger counterparts. This differential appraisal interpretation implies that older and younger adults who confront objectively similar events would experience the events differently. Charles and Carstensen (2008) asked participants to report their reactions as they listened to derogatory comments they imagined were directed at themselves. Older participants reported less anger and expressed fewer negative statements about the speakers than younger adults did. Similarly, Löckenhoff, Cook, Anderson, and Zayas (2013) found that older adults reported less negative emotion than younger adults when exposed to mild social exclusion. Schryer and Ross (2012) assessed older and younger adults’ reactions to other people’s positive, neutral, and negative personal experiences. Older adults offered more positive appraisals of the experiences than younger adults did.

The theoretical and practical implications of the age-related positivity findings differ depending on the interpretations of the positivity effect. For example, if the age-related positivity effect in autobiographical memory is mainly due to different life experiences, then the theoretical focus needs to be on understanding the bases of these behavioral differences, rather than on age differences in attention and recall. Also, quite different psychological mechanisms are likely to be involved if the positivity effect occurs largely during the initial evaluation of an event, rather than during subsequent retrospective reappraisal. We are unaware of prior studies designed to directly test the competing interpretations of an age-related positivity effect in autobiographical recall.

Accordingly, we conducted two studies to evaluate determinants of the positivity effect. Specifically, we assessed whether the age-related positivity effect gets larger as time from the initial event increases or whether the effect is already evident in the initial appraisals. Previous research showing an initial bias (Charles & Carstensen, 2008) does not include later assessments. Retrospective studies (Comblain et al., 2005) include later but not initial assessments. There are a few published longitudinal studies that include both initial and subsequent assessments, but the findings are inconclusive for two reasons. First, there is considerable subject loss over time (Field, 1981; Kennedy et al., 2004), possibly rendering the initial and subsequent samples noncomparable. Second, the assessments are all retrospective—there are no evaluations by older and younger adults soon after the events occurred. Therefore, it is impossible to determine if an age-related positivity effect would already be evident shortly after the experience.

In Study 1, we asked older and younger participants to report one pleasant and one unpleasant event that they experienced each day for 5 days and then to recall those same experiences 2 weeks later. If an age-related positivity bias occurs in the daily diary, then differential experience or early event appraisal remain viable interpretations of this effect. If the bias increases in the later assessment, it seems reasonable to attribute the increase to either forgetting or cognitive reappraisal, but not to differential experience. In Study 2, we attempted to further disentangle the relative contributions of early appraisal and forgetting in a more controlled study in which participants were asked to appraise hypothetical experiences and then to recall those events.

**STUDY 1**

**Method**

Participants.—Participants were 29 older adults aged 67–86 (M = 75.82, SD = 5.31, 14 females) and 30 younger adults aged 17–26 (M = 20.03, SD = 2.00, 19 females). Older participants were community-dwelling adults who volunteered through the Waterloo Research in Aging Pool at the University of Waterloo. Younger participants were
recruited from undergraduate classes. Participants reported that they had no current or recent history of neurological problems (strokes, head injuries, etc.). All participants except for one older adult reported that their first language was English or that they learned English in early childhood (before the age of 8). Participants were paid $25 in appreciation for their participation.

Procedure.—The first session occurred in the lab or (for seven older adults) in the participants’ own homes, depending on their preferences. At the first session, participants finished a series of cognitive assessments including the National Adult Reading Test (NART-R; Blair & Spreen, 1989), digit span forward and backward (Wechsler, 1997), and the Trail Making task, a measure of cognitive flexibility (Partington & Leiter, 1949) (Table 1). All participants scored within normal range for their age groups on the Trail Making and digit span tasks (Strauss, Sherman, & Spreen, 2006).

Participants were asked to complete a daily, online questionnaire from home for five consecutive days (Monday to Friday). The second face-to-face session occurred 5–12 days following the final day on which participants completed the daily diary questionnaire. We only recruited participants who had E-mail addresses and computers in their homes and who expressed a willingness to complete the study online. Nevertheless, because of technological difficulties, three older participants completed the daily questionnaires on paper rather than online.

Participants were instructed to complete the online questionnaire each evening before they went to bed. If they were unable to complete the questionnaire by the end of the day, they could fill it out by noon the following day. Participants were excluded from analyses if they did not fill out the online questionnaire for at least 3 days (i.e., completed fewer than 3 questionnaires). One older and one younger adult were excluded because they completed only one of the online questionnaires. Older (M = 4.75, SD = 0.52) and younger adults (M = 4.66, SD = 0.55) did not differ in the average number of days that they filled out the daily diary questionnaire, F(1, 55) = 0.45, p = .51, η² = .008, the number of days they waited between the end of the diary week and Session 2, F(1, 54) = 1.31, p = .26, η² = .02 (session date information was missing for one older participant), or the average number of words they used to describe their experiences, F(1, 55) = 0.02, p = .88.

Each diary day, participants were asked to describe the most unpleasant and the most pleasant event that had happened to them that day. If participants could not think of a relevant event for that day, they were instructed to move on to the next question. Participants also answered questions about forgetting of everyday events (e.g., appointments, medications; see Schryer, 2012). Only the autobiographical data are reported later. An example of a pleasant event reported by a younger adult was going “to a birthday party for my friend. We ate chocolate cake and laughed a lot.” An older adult reported his most pleasant event as “walking home from the market with my wife. We enjoyed the beautiful weather.” Negative events ranged from a stubbed toe, to attending a funeral. One younger adult reported coming home and discovering “my roommate stole from me again.” An older participant reported getting news that “a person I care about might have cancer.”

In the second lab session, participants completed a surprise recall task. They were asked to recall and describe, in writing, the pleasant and unpleasant events they had reported during the diary week. Once they finished recalling all events, participants were given a list of the experiences that they had reported in their diaries and asked to match up the events they had just recalled with the events they had reported. Two coders, blind to participants’ ages, also matched up the events from the diary questionnaire to events recalled in the second session. Interrater agreement between the coders was high, κ = 0.88 (p < .01), 95% CI (0.84, 0.92). Agreement between the first coder and participants was also high, κ = 0.84 (p < .01), 95% CI (0.80, 0.89). We report results using participants’ match of reported and recalled events but the results are the same if we use coders’ matches.

### Table 1. Background Measures and Cognitive Tasks for Each Age Group (Study 1)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Younger</th>
<th>Older</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education (years)</td>
<td>15.36, 2.09</td>
<td>15.27, 3.28</td>
<td>55</td>
<td>0.31</td>
<td>.03</td>
</tr>
<tr>
<td>FSIQ</td>
<td>108.00, 5.85</td>
<td>116.02, 6.74</td>
<td>55</td>
<td>-4.80</td>
<td>.001*</td>
</tr>
<tr>
<td>Trails A (in seconds)</td>
<td>18.01, 5.57</td>
<td>28.94, 7.48</td>
<td>54</td>
<td>-6.23</td>
<td>.001*</td>
</tr>
<tr>
<td>Trails B (in seconds)</td>
<td>33.69, 10.91</td>
<td>73.50, 33.08</td>
<td>55</td>
<td>-6.76</td>
<td>.001*</td>
</tr>
<tr>
<td>Digit Span (Forward)</td>
<td>8.86, 2.42</td>
<td>8.96, 1.99</td>
<td>55</td>
<td>-0.17</td>
<td>.86</td>
</tr>
<tr>
<td>Digit Span (Backward)</td>
<td>7.45, 2.25</td>
<td>7.46, 2.24</td>
<td>55</td>
<td>-0.03</td>
<td>.98</td>
</tr>
</tbody>
</table>

Notes. The full scale IQ (FSIQ) was derived from the National Adult Reading Test-Revised. Due to experimenter error, data were not collected on the Trails A task for one participant.

*p < .05.

Results

Preliminary analyses revealed no effects of gender. Unless otherwise reported, data were analyzed in a 2 (event type: pleasant and unpleasant) × 2 (age group: younger and older) analysis of variance. Event type was a within-subjects factor and age group a between-subjects factor.

All of the younger adults reported a most pleasant event for each of the days that they completed the diary, as did all but one of the older adults (who failed to report a most pleasant event on 1 day), x²(1, N = 57) = 0.31, p = .49. All of the younger adults reported their most unpleasant event each day. In contrast, 11 older adults (38% of the sample) failed to report an unpleasant event on at least one of the diary questionnaires, x²(1, N = 57) = 14.12, p = .02.
To examine whether older and younger participants’ experiences differed in severity, two coders rated the valence of participants’ events on a scale from −3 (very negative) to +3 (very positive). (It was not always possible for the coders to be blind to the age group of the participants. Older and younger adults lead somewhat different lives and those differences were reflected in the content of the diary events.) The correlation (ICC) between the coders’ ratings was .53. We calculated the coders’ average ratings for each type of event. The coders rated pleasant events \( (M = 1.30, SD = 0.31) \) more positively than unpleasant events \( (M = −1.23, SD = 0.45) \), \( F(1, 55) = 1,023.04, p < .001, \eta^2_p = .95 \). No other effects were significant. The coders did not rate older \( (M = 0.08, SD = 0.45) \) and younger \( (M = −0.01, SD = 0.27) \) participants’ experiences as significantly different in valence, \( F(1, 55) = 2.32, p = .13, \eta^2_p = .04 \).

To examine participants’ recall of the diary events in the second lab session, we calculated the proportion of pleasant and unpleasant events that participants reported during the diary week that they correctly recalled a week or more later. Older and younger adults recalled similar proportions of the pleasant \( (M_{OLDER} = 0.48, SD = 0.26; M_{YOUNGER} = 0.53, SD = 0.19) \) and unpleasant \( (M_{OLDER} = 0.47, SD = 0.28; M_{YOUNGER} = 0.51, SD = 0.29) \) events that they had initially reported during the diary week, \( F(1, 55) = 0.10, p = .92, \eta^2_p = .00 \).

Discussion

We anticipated that every participant would report one most pleasant and one most unpleasant event each day in their diary. Almost all participants did report pleasant events but over a third of the older participants failed to provide a most unpleasant event for at least one of the diary days. When they omitted unpleasant events, older participants sometimes wrote comments. These comments included: “I cannot think of a single unpleasant event for this day” and “I do not relate this word (unpleasant) to my life.”

There are a number of possible explanations for why older adults reported fewer unpleasant events during the diary week than younger adults did. The simplest explanation is that the difference reflects the daily experiences of the two groups. An alternative and psychologically more intriguing explanation is that older and younger adults differ in their initial appraisal of events. Older adults may report fewer unpleasant events because they have a higher threshold for categorizing events as unpleasant. This explanation does not eliminate the possibility that older adults also have fewer unpleasant experiences, but it suggests that even when older and younger adults experience objectively similar events, they will evaluate those events differently.

A third possibility is that older adults experience and appraise negative events similarly to younger adults, but are more likely to forget their occurrence by the end of the day. This explanation does not rule out the possibility that older adults may have fewer negative experiences, but it suggests that older adults may also have a memory bias for positive information even when memory is assessed the same day as the experiences. In studies of age differences in memory for visual stimuli, older adults forget more negative than positive images and this forgetting occurs over a relatively short time span (usually 15 min to an hour; Charles et al., 2003; Kwon et al., 2009; Mather & Carstensen, 2003). Older adults may similarly forget negative personal events quickly. Note, however, that when older adults did record negative events in their diary, they were just as likely as younger adults to recall them a week or more later. Although it is possible that the negative events recorded by older people were different from ones that they may have failed to report (e.g., more negative), the recall data from the second lab session do not provide compelling support for a memory interpretation. In Study 2, we attempted to examine the relative contributions of early appraisal and forgetting in a more controlled setting.

Study 2

We presented older and younger participants with a series of hypothetical personal experiences and asked them to assess the positivity or negativity of the events. We experimentally varied the self-relevance of the events by asking participants to imagine either that the events happened to them or to an acquaintance. We also varied the valence of the events, including positive, negative, and neutral episodes. After a delay, participants were asked to recall the hypothetical vignettes.

SST theory implies that older people should be more concerned with self-regulation when events are self-relevant (Mather & Carstensen, 2005), but past research has not always supported this hypothesis. Schryer and Ross (2012) found that older adults generally rated events more positively than younger adults did, but both older and younger adults rated their own positive experiences more positively and their own negative experiences more negatively than those of a same-aged peer. Schryer and Ross (2012) compared individuals’ appraisals of events that had been personally experienced with their appraisals of events that were experienced by others. Memories of experienced events are not just more self-relevant, they are also richer in semantic details and context compared with events described by another person.

This study included a more controlled test of the effects of self-relevance on event appraisals. If the self-relevance of events is important to the positivity effect, as suggested by SST, then older adults might appraise events more positively than younger adults when they imagine those events happening to themselves. This age difference in appraisal should decrease when participants imagine that the experiences happened to an acquaintance. Further, when prompted
to recall the hypothetical events, older adults might be particularly motivated to forget unpleasant experiences that are more highly self-relevant (Mather & Carstensen, 2005).

Finally, we included a condensed version of DeLongis, Folkman, and Lazarus’s (1988) Daily Hassles and Uplifts scale. This scale measures the extent to which individuals interpret daily experiences as pleasant (uplifts) or unpleasant (hassles). In Study 1, participants chose the types of experiences that they would report, and those experiences varied in theme and content between individuals and age groups. In Study 2, the Daily Hassles and Uplifts scale allowed us to examine older and younger adults’ affective evaluations of similar autobiographical experiences. In prior research, Kanner, Coyne, Schaefer, and Lazarus (1981) found that older participants were more likely to view their experiences as uplifting, but obtained no age-related change in assessing experiences as hassles (participants’ age range was only 45–64). In contrast, Folkman and colleagues (1987) found that older adults (aged 65–74) viewed their experiences as less of a hassle than younger respondents did (aged 35–45). Folkman et al. (1987) did not assess uplifts. If older adults generally appraise events more positively, then we would expect them to evaluate their experiences as both more uplifting and less of a hassle than younger adults do.

Method

Participants.—Participants were 49 older adults between the ages of 65 and 88 (M = 74.92, SD = 6.41, 30 female participants) and 48 younger adults between the ages of 18 and 24 (M = 20.48, SD = 1.44, 31 female participants). Older adults were recruited through the Waterloo Research in Aging pool and received $10 in appreciation for their participation. Younger participants were undergraduate students at the University of Waterloo and were recruited through announcements in their classes and received either $10 or partial course credit in remuneration for their involvement. Six younger and eight older adults reported that they learned English after early childhood. All results reported later (unless otherwise indicated) are significant regardless of whether these participants are included in the analyses or not.

Materials.—Participants read about 12 hypothetical events. Four of the events were mainly positive, four were mainly negative, and four were neutral. Each event description contained between 46 and 50 words. In the previous study, participants’ diary reports often contained a mix of both positive and negative details. For example, when recalling a shopping trip, an individual might remember both an unpleasant encounter with a pushy salesperson and the joy of finding a great outfit. To mimic this complexity, we designed the hypothetical events in this study to be somewhat mixed experiences. Mainly positive events contained three positive details and one negative detail about the event (e.g., “The bride and groom looked really happy together. The food was bad, which was disappointing. But the music was fabulous and, for me, I danced a lot.”). Negative events contained three negative details and one positive detail. Neutral events contained four details that seemed affectively neutral (e.g., I bought toothpaste at the pharmacy). The events were derived from experiences reported in the diary questionnaires in Study 1 and were designed to be applicable to both older and younger adults.

Procedure.—Participants were asked to imagine that the events either happened to them or to a 40-year-old same gender acquaintance named Joan or John. We chose a 40-year-old, so that the person was intermediate between the ages of participants in the two groups. Participants rated each event for valence, emotional arousal, and self-relevance. Although we are primarily interested in valence from a theoretical perspective, we included arousal because valence and arousal are the two most important components of emotional experience (Kensinger, 2009).

We collected the measurements using SAM (Self-Assessment Manikin), a pictorial nonverbal measure of affective reactions (Bradley & Lang, 1994). Participants indicated the positivity or negativity of each event by circling one of nine pictures of manikins with facial expressions ranging from a frown to a smile. Participants circled a second set of manikins to indicate how emotionally arousing they found each event to be. We used a third set of manikins ranging in size from very small to large to assess the self-relevance of the events as a check on the effectiveness of the self-relevance manipulation. Once participants had finished assessing the hypothetical events, they completed the same cognitive tasks used in Study 1 (Table 2), to provide a time interval before the recall test. All participants scored within normal range on the digit span and Trail Making tasks. On average, older adults took longer to complete the Trail Making tasks (Table 2). It is possible, therefore, that the delay between encoding and retrieval was longer for older than younger adults. However, it is unlikely that any age differences in biased recall of events would be affected by

Table 2. Background Measures and Cognitive Tasks for Each Age Group (Study 2)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Younger</th>
<th></th>
<th></th>
<th>Older</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>M  SD</td>
<td></td>
<td></td>
<td>M  SD</td>
<td></td>
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<tr>
<td>Education (years)</td>
<td>15.84 1.81</td>
<td></td>
<td></td>
<td>14.74 3.25</td>
<td>85</td>
<td>1.98</td>
</tr>
<tr>
<td>FSIQ</td>
<td>104.74 7.16</td>
<td></td>
<td></td>
<td>114.54 6.83</td>
<td>95</td>
<td>−6.90</td>
</tr>
<tr>
<td>Trails A (in seconds)</td>
<td>18.25 6.83</td>
<td></td>
<td></td>
<td>33.92 9.22</td>
<td>95</td>
<td>−9.49</td>
</tr>
<tr>
<td>Trails B (in seconds)</td>
<td>38.8 13.15</td>
<td></td>
<td></td>
<td>78.69 32.87</td>
<td>95</td>
<td>−7.86</td>
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<tr>
<td>Digit Span (Forward)</td>
<td>7.75 1.02</td>
<td></td>
<td></td>
<td>7.16 1.32</td>
<td>95</td>
<td>2.44</td>
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<td>Digit Span (Backward)</td>
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<td>6.90 1.56</td>
<td>95</td>
<td>0.96</td>
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Notes: The full scale IQ (FSIQ) was derived from the National Adult Reading Test-Revised. Ten participants did not report years of education. *p < .05.
this small difference. Mather and Knight (2005) found no effect of time delay (20 min vs 48 hr) on the age-related positivity effect.

After completing the cognitive tasks, participants received a surprise recall test. They were given a sheet of paper and asked to recall and briefly describe, in no particular order, all of the hypothetical events that they could remember. Participants were given a maximum of 10 min for this recall task. All participants indicated to the experimenter that they had finished writing down all of the events that they could remember before the time limit expired. After completing the recall task, participants were given the original list of events and asked to indicate which they had recalled correctly.

Finally, participants completed a shortened version of DeLongis et al.’s (1988) Daily Hassles and Uplifts scale. We removed 15 items from the original scale that related to family, home, and work relationships; these items may not have been applicable to both age groups (e.g., relationships with children). Participants were presented with a list of 38 experiences and asked to indicate whether they had experienced each situation that day (applicable/nonapplicable). They then rated the extent to which they regarded each experience that they had experienced that day as a hassle and an uplift on a scale from 0 (none) to 3 (a great deal).

Results and Discussion

Preliminary analyses revealed no effects of gender that would qualify the findings reported in the following paragraphs. Unless otherwise reported, all data were analyzed in a 2 (age group: older and younger) × 2 (perspective: self and acquaintance) × 3 (event type: positive, negative, and neutral) multivariate analysis of variance. Age and perspective were between-subjects variables and event type was a withinsubjects variable.

The main effect of perspective condition on assessments of self-relevance was significant, $F(1, 91) = 5.42, p = .02, \eta_p^2 = .06$ (one older participant did not rate events for self-relevance). Participants who imagined that the events happened to them rated the events as more self-relevant than participants who imagined the events happened to an acquaintance. No other effects were significant on this measure.

On judgments of valence, main effects of event type, $F(2, 92) = 244.01, p < .01, \eta_p^2 = .84$, perspective condition, $F(1, 93) = 7.62, p < .01, \eta_p^2 = .08$, and age group, $F(1, 93) = 4.84, p = .03, \eta_p^2 = .05$, were significant. Condition means are presented in Table 3. Not surprisingly, participants rated positive events most positively and negative events least positively. Participants in the self-relevant condition rated events more positively than participants in the acquaintance condition did. Finally, older adults rated events, in general, more positively than younger adults did. (When English as a second language, participants were excluded the main

Table 3. Mean and Standard Deviation (in Parentheses) of Older and Younger Adults’ Average Valence Ratings for Positive, Negative, and Neutral Events in the Self- and Acquaintance Conditions (Study 2)

<table>
<thead>
<tr>
<th>Event type</th>
<th>Self-perspective</th>
<th>Acquaintance perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Younger</td>
<td>Older</td>
</tr>
<tr>
<td>Positive</td>
<td>7.35 (0.97)</td>
<td>7.83 (0.79)</td>
</tr>
<tr>
<td>Negative</td>
<td>3.48 (0.87)</td>
<td>4.27 (1.48)</td>
</tr>
<tr>
<td>Neutral</td>
<td>5.64 (0.80)</td>
<td>5.81 (1.04)</td>
</tr>
</tbody>
</table>

effect of age was marginal $[p = .11]$. However, the interaction between age group and self-relevance condition was significant, $F(1, 79) = 4.45, p = .05, \eta_p^2 = .05$. Neither the three-way interaction between age group, self-relevance condition, and event type, $F(2, 92) = 0.87, p = .42, \eta_p^2 = .02$, nor the two-way interaction between age group and self-relevance, $F(1, 93) = 2.02, p = .16, \eta_p^2 = .02$, were significant (Table 3).

Because we made the focused prediction (based on SST theory) that older adults would be particularly motivated to evaluate self-relevant events more positively, we conducted a planned contrast comparing older participants’ valence ratings in the self-relevant condition with the ratings of the participants in the three remaining conditions. As predicted, older adults who imagined that the events happened to themselves rated events more positively ($M_{OLDER, SELF-RELEVANT} = 5.97, SD = 0.86$) than participants in the three other conditions did (grand mean = 5.41; $M_{OLDER, ACQUAINTANCE} = 5.42, SD = 0.62; M_{YOUNGER, SELF-RELEVANT} = 5.49, SD = 0.52; M_{YOUNGER, ACQUAINTANCE} = 5.32, SD = 0.51), $p < .01$. No other differences among conditions were significant.

On ratings of arousal, a main effect of event type was significant, $F(2, 92) = 103.09, p < .01, \eta_p^2 = .69$. Participants did not differ in their ratings of arousal for positive and negative events, $F(1, 96) = 0.002, p = .96, \eta_p^2 = .00$. They rated both positive, $F(1, 96) = 150.69, p < .01, \eta_p^2 = .61$, and negative, $F(1, 96) = 148.88, p < .01, \eta_p^2 = .61$ events as more emotionally arousing than neutral events. Older adults rated events as more arousing than younger adults did, $F(1, 93) = 5.07, p = .03, \eta_p^2 = .05$. No other effects were significant.

Memory for events.—Two coders, blind to participants ages, matched participants’ recall with the original hypothetical scenarios. An event was coded as correctly recalled if the participant either remembered the main theme of the scenario (e.g., going to a wedding) or recalled two or more related details from the event (e.g., the food was bad and I danced a lot). Agreement between the coders was high, $\kappa = 0.87$ ($p < .01$), 95% CI (0.83, 0.91), and agreement between the first coder and participants was also high, $\kappa = 0.85$ ($p < .01$), 95% CI (0.80, 0.89). Participants’ judgments of matches were used in the following analyses, but the pattern of
significant findings is the same if the coders’ judgments are used instead. We calculated the mean number of positive, negative, and neutral events that each participant correctly recalled.

A main effect of event type was significant, \( F(2, 92) = 19.38, p < .01, \eta_p^2 = .30 \). Participants recalled more negative than positive events, \( F(1, 93) = 7.39, p < .01, \eta_p^2 = .07 \), and a greater proportion of positive, \( F(1, 93) = 13.76, p < .01, \eta_p^2 = .13 \), and negative, \( F(1, 93) = 38.76, p < .01, \eta_p^2 = .29 \) than neutral events (see Table 4). The interaction between event type and self-relevance condition was also significant, \( F(2, 92) = 3.76, p = .03, \eta_p^2 = .08 \). Participants recalled a greater proportion of negative events in the self-relevant than in the acquaintance condition, \( F(1, 95) = 6.19, p = .02, \eta_p^2 = .06 \). Participants did not differ in their recall of positive events, \( F(1, 95) = 0.03, p = .85, \eta_p^2 = .00 \), or neutral events, \( F(1, 95) = 0.80, p = .38, \eta_p^2 = .01 \), as a function of self-relevance. Younger adults recalled marginally more events than older adults did, \( F(1, 93) = 2.97, p = .09, \eta_p^2 = .03 \). This effect was qualified by an age by self-relevance condition interaction, \( F(1, 93) = 5.02, p = .03, \eta_p^2 = .05 \). Younger participants recalled more events in the self-relevant than in the acquaintance condition, \( F(1, 46) = 4.17, p = .05, \eta_p^2 = .08 \). Older adults recalled the same proportion of events in the self-relevant and acquaintance conditions, \( F(1, 47) = 1.21, p = .27, \eta_p^2 = .03 \). In the self-relevant condition, younger adults recalled more events than older adults, \( F(1, 48) = 7.25, p = .01, \eta_p^2 = .13 \). In the acquaintance condition, older and younger adults recalled a similar proportion of events, \( F(1, 45) = 0.15, p = .70, \eta_p^2 = .01 \). The interactions between age and event type, \( F(2, 92) = 1.74, p = .18, \eta_p^2 = .04 \), and age, condition, and event type, \( F(2, 92) = 2.18, p = .12, \eta_p^2 = .05 \), did not reach significance. As in Study 1, we found no evidence that older adults were more likely to remember positive events or less likely to recall negative events than younger adults were.

**Daily Hassles and Uplifts scale.**—Older adults identified a greater proportion of the items as being applicable to them than younger adults did (\( M_{\text{OLDER}} = 0.81, SD = 0.15; M_{\text{YOUNGER}} = 0.75, SD = 0.15 \)), \( F(1, 95) = 5.12, p = .03, \eta_p^2 = .05 \). To equate the frequency of items across the age groups, we identified and removed eight items (health of family, family obligations, financial care, the weather, political and social issues, car maintenance, church commitments, and legal obligations) for which older and younger adults differed in applicability (all \( ps < .05 \)). For the remaining 30 items, participants across both age groups rated experiences as being more uplifting (\( M = 1.54, SD = 0.54 \)) than a hassle (\( M = 0.84, SD = 0.45 \)), \( F(1, 95) = 88.69, p < .001, \eta_p^2 = .48 \). The interaction between age and assessment of the events as hassles or uplifts was also significant, \( F(1, 94) = 13.90, p < .01, \eta_p^2 = .13 \) (the interaction between age group and perception of the items as an uplift or hassle remained significant \( p < .01 \) when the eight items that differed in applicability with age were included in the analyses).

Older adults (\( M = 1.68, SD = 0.52 \)) rated the experiences as more uplifting than younger adults did (\( M = 1.40, SD = 0.52 \)), \( F(1, 94) = 6.81, p = .01, \eta_p^2 = .07 \). Older adults also rated the experiences as less of a hassle (\( M = 0.72, SD = 0.43 \)) than younger adults did (\( M = 0.96, SD = 0.45 \)), \( F(1, 94) = 7.62, p < .01, \eta_p^2 = .08 \).

**General Discussion**

Our primary goal in this research was to examine the relative contributions of recall and appraisal to age differences in affective evaluations of personal and hypothetical experiences. We found little evidence that older adults were less likely to recall negative events compared with younger adults. Older participants in Study 1 reported fewer negative experiences during the diary week, but were just as likely as younger adults to later recall the negative experiences that they originally reported. In Study 2, older and younger adults did not differ in their likelihood of recalling positive and negative hypothetical events.

Older adults in Study 1 may have reported fewer unpleasant memories during the diary week because they experienced fewer unpleasant events. However, the data from Study 2 suggest that a difference in experience does not completely explain the age-related positivity effect. Older participants in Study 2 appraised both hypothetical episodes and their own daily experiences (on the Daily Hassles and Uplifts scale) more positively. The data from Study 2 suggest that age differences in appraisal are driven, at least in part, by age differences in participants’ initial evaluations of events.

In earlier research (Carstensen, 2006; Fernandes et al., 2008; Thomas & Hasher, 2006), older adults were more likely to remember positive and less likely to remember negative pictures and words compared with their younger counterparts. Why did we not find a similar age difference in memory for autobiographical events? Mather and Carstensen (2003) found that age differences in memory for pictures of faces with negative expressions partly reflect the tendency of older adults to pay less attention to negative expressions. A similar age bias in attention may be less likely for autobiographical events. Individuals can, to an extent, choose their own experiences. Once an experience

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**Table 4.** Mean and Standard Deviation (in Parentheses) of the Proportion of Positive, Negative, and Neutral Events Recalled by Older and Younger Adults in Self- and Acquaintance Conditions (Study 2)

<table>
<thead>
<tr>
<th>Event type</th>
<th>Self-perspective</th>
<th>Acquaintance perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Younger</td>
<td>Older</td>
</tr>
<tr>
<td>Positive</td>
<td>0.63 (0.23)</td>
<td>0.41 (0.21)</td>
</tr>
<tr>
<td>Negative</td>
<td>0.68 (0.27)</td>
<td>0.65 (0.28)</td>
</tr>
<tr>
<td>Neutral</td>
<td>0.46 (0.29)</td>
<td>0.28 (0.29)</td>
</tr>
</tbody>
</table>
has begun, however, people of all ages may need to pay sufficient attention to respond effectively. In the current research, Study 2 included hypothetical events, but the instructions demanded that participants pay considerable attention to the scenarios. The age-related positivity effect in memory may occur mainly in research in which participants can readily engage in selective attention, for example, focus more on pleasant than on unpleasant visual stimuli (Charles et al., 2003; Fernandes et al., 2008; Langeslag & van Strien, 2009; Mather & Carstensen, 2003).

Although we found no age differences in recall, older participants evaluated hypothetical autobiographical events more positively than younger adults did. This finding is consistent with past research on autobiographical memory (Comblain et al., 2005; Schryer & Ross, 2012). Interestingly, there is little evidence that older adults appraise other kinds of emotional stimuli, such as pictures or words, more positively than their younger counterparts do (Charles et al., 2003; Fernandes et al., 2008; Spaniol, Voss, & Grady, 2008). Conceivably, age differences in appraisal occur primarily for stimuli that are somewhat ambiguous in valence. The hypothetical events in Study 2 included a mix of positive and negative elements, as is common in autobiographical experiences. Picture and word stimuli, in contrast, are selected to be definitively positive or negative. A picture of a cockroach may be negative to individuals, regardless of age.

It is also possible that older and younger adults possess different standards for what constitutes unpleasant experiences. For older adults who have experienced the loss of parents, spouses, or friends, a minor social faux pas may seem trivial. A younger adult may experience a similar faux pas as a serious life event. In Study 1, coders did not rate older and younger adults’ diary events as significantly different in valence. However, participants in Study 1 chose the events they labeled as unpleasant. Older adults and younger adults may have different thresholds regarding what gets categorized as negative. Once events are labeled as negative, age differences in appraisal may be small.

In Study 2, we found some support for the SST self-relevance hypothesis. Older participants who imagined experiences as happening to themselves appraised events more positively than participants in the remaining conditions did. Self-relevance did not, however, affect older and younger adults’ memory for emotional events in Study 2. Irrespective of age, participants recalled more negative events in the self-relevant than in the acquaintance condition.

There are several limitations to the current research. In both of the studies, we examined recall of events over a relatively short time span. It is possible that if memory for emotional events were tested months or years after the original experience, an age-related positivity effect in recall might occur. However, the absence of an age-related positivity effect in recall in the present studies is not due to the possibility that participants remembered the events extremely well. In Study 1, participants failed to recall an average of 50% of their diary events, and participants in Study 2 failed to recall 45% of the hypothetical events. Despite a great deal of forgetting, we were unable to find evidence of an age-related positivity effect in recall.

In summary, the current studies help to clarify the bases of the age-related positivity effect in autobiographical recall. The effect is due, at least in part, to differing standards that older and younger adults use to appraise the valence of events rather than a preferential processing of positive over negative details or biased recall.

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