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Age Differences in Descriptions of Emotional Experiences in Oneself and Others

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Abstract

We analyzed language use to examine age differences in people's representations of their own emotions as compared with those of others. Participants (N = 365, aged 18–85 years, M = 42.8, SD = 19.2) read hypothetical emotion-eliciting scenarios and described how they themselves and the social partners involved in the scenarios would feel. Compared with those of younger adults, older adults' descriptions involved a higher frequency of positive and a lower frequency of negative emotions. Older adults were also more likely to describe a co-occurrence of positive and negative emotions, but less likely to describe the simultaneous experience of multiple negative emotions. Age effects showed similar patterns for participants' descriptions of their own emotions as compared with those of others. We discuss the implications for theoretical accounts of emotional aging.

Keywords

Age-related differences; Emotional aging; emotional experience

Emotional development in adulthood shows remarkable resilience, suggesting that emotional functioning is well maintained into the later years (e.g., Carstensen, Fung, & Charles, 2003). Until now, however, age differences in people's representations of their own emotions have been studied independently from representations of others' emotions. In child development, the perception of complex emotions in oneself is related to the tendency to attribute them to others (Ricard & Kamberk-Kilicci, 1995), but empirical evidence for a similar association in adult development remains scarce. To address this issue, in the present study we compared descriptions of emotional experiences in oneself and others based on open-ended responses to hypothetical scenarios in a sample ranging from young to old adulthood. To provide the background for our predictions, we review the literature on age differences in self-reported emotional experience and emotional processing.

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Age Differences in Emotional Experience

Emotional experience undergoes systematic developmental changes across the life span. Compared with younger adults, older adults report equal or more positive affect but less negative affect in experience-sampling studies of daily emotions (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000), retrospective reports of emotions (e.g., Gross et al., 1997; Mroczek & Kolarz, 1998; also see Charles, Reynolds, & Gatz, 2001, although see Kunzmann, Little, & Smith, 2000), and verbal expressions of emotions in written narratives (Pennebaker & Stone, 2003).

Age differences also affect the experience of discrete negative emotions. The pattern is most consistent for anger. Compared with younger adults, older adults are less likely to experience this emotion (e.g., Gross et al., 1997, Studies 3 and 4; Schieman, 1999; also see Phillips, Henry, Hosie, & Milne, 2006, although see Charles, 2005) or express it (e.g., Carstensen, Gottman, & Levenson, 1995; Phillips et al.). For anxiety or fear as well as sadness, some studies suggest less frequent experience in advanced age (Gross et al., Study 4) but others find no age differences (Gross et al., Study 3; Tsai, Levenson, & Carstensen, 2000). One study using sadness-eliciting videos even found greater self-reported sadness among older adults (Kunzmann & Grühn, 2005).

Extending the focus beyond discrete emotions, studies have also examined age differences in emotional complexity, although the field has yet to arrive at a consensus regarding the conceptualization of such phenomena. Labouvie-Vief and her colleagues (e.g., Labouvie-Vief & Medler, 2002; Labouvie-Vief, 2003) examined ‘‘cognitive-affective complexity’’ (CAC) by coding self-representational statements into qualitative levels based on integrated judgments of emotions, motivations, and interpersonal dynamics. They found CAC, which has a strong cognitive component, to follow a curvilinear trajectory with a peak in midlife (Labouvie-Vief, 2003). Other measures of complexity are derived from quantitative emotion scores. Some researchers have found poignancy, that is, the co-occurrence of positive and negative emotions (Ersner-Hershfield, Mikels, Sullivan, & Carstensen, in press; Carstensen et al., 2000), to correlate positively with advanced age and resilience in experience-sampling studies (Ong & Bergeman, 2004, Carstensen et al.). Compared with younger adults, older adults also show more emotional heterogeneity (i.e., a greater overlap among the dominant negative emotions) when responding to film clips depicting injustice (Charles, 2005) and when reliving past episodes of anger and sadness (Magai, Consedine, Krivoshekova, Kudadjie-Gyamfi, & McPherson, 2006).

Age Differences in Emotional Processing and Appraisal of Social Contexts

Age differences in emotional experience are accompanied by age differences in emotional processing. Compared with younger adults, older adults place greater emphasis on emotionally salient information and they attend to, memorize, and process a greater proportion of positive relative to negative material (for a review see Mather & Carstensen, 2005). This phenomenon, which has been termed the ‘‘positivity effect’’ (Mather & Carstensen, 2005), is found across a variety of tasks ranging from decision-related review strategies (Löckenhoff & Carstensen, 2007) to the recall of emotionally charged material

(e.g., Charles, Mather, & Carstensen, 2003; Kennedy, Mather, & Carstensen, 2004; see, however, Grühn, Smith, & Baltes, 2005). In the present study we examined whether age differences in emotional processing also influence the socioemotional reasoning processes involved in attributing emotional experiences to oneself and others. In support of this view, an age-related focus on emotional information in general and on positive information in particular appears to affect the social realm as well.

In a card-sorting task examining mental representations of social partners, older adults assigned greater salience to emotional aspects than younger adults did (Fredrickson & Carstensen, 1990), and, when asked to recall narrative passages describing conversations, older adults were more likely to recall emotional than neutral material whereas younger adults did not show this effect (Carstensen & Turk-Charles, 1994). In addition, when presented with pairs of faces showing emotional expressions, older adults directed their attention away from negative expressions and toward positive ones (Mather & Carstensen, 2003).

Further, older adults interpret social situations in ways that limit negative and promote positive emotions in themselves and others. When coping with stress, older adults report more frequent use of positive reappraisal than young adults do (Diehl, Coyle, & Labouvie-Vief, 1996; Folkman, Lazarus, Pimley, & Novacek, 1987), and when faced with hypothetical everyday problems, older adults use more emotion-focused strategies such as avoidance or denial than younger adults do (Blanchard-Fields, Chen, & Norris, 1997; Blanchard-Fields, Jahnke, & Camp, 1995).

The Present Study

Although prior research indicates that information processing in social contexts shows a focus on emotional information and a prioritization of positive over negative information in advanced age, previous studies have focused on people’s reports of their own emotions or appraisals of situations as a whole. Our aim in this study was to extend this research by systematically comparing representations of emotions in oneself versus those in others.

For this purpose, we examined responses to hypothetical emotion-eliciting scenarios. Participants described how they and the social partners involved in the scenarios would feel. We provided an open-ended format for the answers and we derived quantitative emotion scores by using a computer-based linguistic analysis tool (Pennebaker, Francis, & Booth, 2001). Compared with the frequently used emotional rating scales (e.g., Carstensen et al., 2000), this approach is less susceptible to biases associated with formal characteristics of response options (e.g., the numerical anchors), which is important for the present context because there appear to be age differences in such biases (Schwarz & Park, 1999).

On the basis of prior research examining emotional processing in social contexts, we expected to find that advanced age would be positively associated with descriptions of positive emotions in oneself and others and negatively associated with descriptions of negative emotions. Because research has also indicated differential age effects for specific negative emotions and blends of emotions, we examined indices of anger, sadness, and

anxiety or fear, as well as two quantitative markers of blended emotions: poignancy (i.e., a blend among positive and negative emotions) and heterogeneity (i.e., a blend among multiple negative emotions). Finally, to examine whether the ability to differentiate among one's own emotions and those of others varies by age, we examined the congruence of emotions ascribed to oneself versus one's social partner.

Methods

Participants

We recruited participants (N = 381) in Tucson, AZ and Marshall, MN through public advertisements and word of mouth. All participants were native English speakers and self-reports indicated no history of psychiatric disorders, substance abuse, or cognitive impairment.

We designed our recruitment strategies to achieve roughly equal distributions of gender and socioeconomic status across the adult age range. On the basis of the U.S. Census socioeconomic index and Nam–Powers scoring, we grouped participants into three levels of socioeconomic status: 1 = working class (e.g., laborers), 2 = middle class (e.g., salespeople), 3 = upper class (e.g., professional or technical workers). Although we treated age as a continuous variable for hypothesis testing, we did split the sample into young adults (18–39 years), middle-aged adults (40–59 years), and older adults (60–85 years) for descriptive purposes.

We excluded 16 participants: 7 were missing the age variable, 4 had missing or unreadable answers, and 5 gave ironic or off-topic answers. For the remaining participants, Table 1 presents demographic characteristics by age group and for the sample as a whole. A trend for gender that approached significance (p = .06) suggested that the proportion of women tended to be higher in older age groups. Consistent with the demographic structure at the recruitment locations, the percentage of minority participants was significantly higher in the younger groups. There were no age differences in job status, but Bonferroni post hoc tests suggested that the middle-aged group was more educated than both the younger (p < .05) and the older (p < .05) group. In the analyses reported hereafter, we considered demographic variables that differed by age.

Materials

To elicit emotional descriptions, we used the Levels of Emotional Awareness Scale (LEAS; Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990). Stimuli consist of 20 short emotion-eliciting scenarios covering a wide range of emotional situations. Participants describe both their own emotional reactions and the reactions of a hypothetical social partner. For example, one scenario reads as follows: "Someone who has been critical of you in the past pays you a compliment. How would you feel? How would the other person feel?"[1]

[1]Although the LEAS was originally created as a performance measure of emotional awareness, the item format closely resembles that of other studies examining emotional representations (e.g., Ricard & Kamberk-Kilicci, 1995). LEAS items do not have right or wrong answers and do not prompt participants to respond with specific emotion terms (e.g., *sad*) to a given scenario. Because of this open-ended nature, the LEAS items lend themselves not only to the original performance-based scoring approach but also to the more descriptive scoring approach that we use in the present study.

Social partners range from complete strangers (e.g., a pedestrian seen from a car) to family members (e.g., spouse). All are adults but no further descriptive information regarding age and gender is given. Previous studies using the LEAS in life-span samples found no indication that age groups differed in their formal understanding of item content (e.g., Consoli et al., 2006; Subic-Wrana, Bruder, Thomas, Lane, & Köhle, 2005).

Procedure

Small groups of four to six participants completed the questionnaires in quiet settings (e.g., community centers). We obtained informed consent for all participants and a research assistant was present to answer questions and prevent communication among participants. Participants received financial compensation of $10.[2]

Data Preparation

We performed a computerized text analysis by using the Linguistic Inquiry and Word Count software (LIWC2001; Pennebaker et al., 2001). We chose the LIWC2001 because it provides scores for the core variables relevant to our hypotheses. It was successfully used in previous studies examining conceptions and representations of emotions (e.g., Djikic, Oatley, & Peterson, 2006; Pennebaker & Stone, 2003; Tsai, Simeonova, & Watanabe, 2004) and predicts important outcomes, including recovery from bereavement (Pennebaker, Mayne, & Francis, 1997) and suicide rates (Stirman & Pennebaker, 2001). A validation study among 72 undergraduates (Pennebaker et al., 2001) found that, for the emotion scores used in the present study, the correlations between LIWC scores and scores assigned by human judges were satisfactory, as they ranged from .57 (for anxiety or fear and anger) to . 75 (for negative emotions). Age differences in LIWC2001 scores observed in contemporary cross-sectional samples resemble longitudinal changes among fiction writers from different historical periods (Pennebaker & Stone). This suggests that age differences in emotional language use are not explained by cohort effects.

Transcribers were blinded to demographic characteristics and followed the LIWC2001 guidelines. We compiled separate files based on the target (self vs other) of the statements. Most participants wrote separate paragraphs about each target. For answers that combined self- and other-related statements (0.1% of responses), transcribers sorted sentences and subclauses manually. We resolved ambiguities by consensus agreement among the three transcribers. We entered statements that used the first-person plural (e.g., *us*; 0.4% of responses) or responses indicating that the other person would feel the same as oneself (1.5% of responses) into both the Self and the Other file. For each participant, we created 40 text files corresponding to the self- and other-related responses to each of the 20 questions.

Although the LIWC2001 extracts up to 70 categories, we focused on the subset of variables relevant to the aims of the present study.

[2]In the same session, participants also completed the Perception of Affect Task, the Toronto Alexithymia Scale, the Marlowe–Crowne Scale, and the Taylor Manifest Anxiety Scale. These results have been reported elsewhere (Lane et al., 1996; Lane, Sechrest, & Riedel, 1998; Lane, Sechrest, Riedel, Shapiro, & Kaszniak, 2000, Isaacowitz et al., 2007). Findings suggest that alexithymia, low emotional awareness, and high social desirability scores are associated with impaired emotion recognition, and that emotion recognition is worse among older adults than among younger adults.

Data quality—We assessed data quality by average word count and percentage of words captured by the dictionary. To determine whether the split into responses pertaining to self and other was successful, we examined the frequency of *personal pronouns* for first-person singular (e.g., *I, my*) and third-person singular and plural (e.g., *he, they*).

Emotional representations—We assessed emotional representations by frequencies of positive emotions (e.g., *happy, good*) and negative emotions (e.g., *worthless, hate*) and the specific negative emotions of anxiety or fear (e.g., *afraid*), anger (e.g., *annoyed*), and sadness (e.g., *grief*).

Poignancy scores—We derived poignancy scores by computing, for each participant, the intraclass correlations among the frequency of positive and negative emotional descriptions across the 20 scenarios by using the double-entry method (cf. Carstensen et al., 2000; Ong & Bergeman, 2004).[3] We computed separate scores for self and other. Higher scores indicate a decoupling of the typically observed negative association between positive and negative emotions and thus greater poignancy.

Heterogeneity scores—We conceptualized heterogeneity as the description of simultaneous negative emotions (Charles, 2005) and derived heterogeneity scores by counting the number of specific negative emotions (i.e., anger, sadness, and anxiety) present in a given scenario for each participant and target person. Possible scores ranged from 0 to 3 with higher scores indicating greater heterogeneity.

To avoid a disproportionate influence of scenarios eliciting long responses or of individuals with high word counts, we report all scores, except of word count, poignancy, and heterogeneity, as percentages of total words (cf. Pennebaker et al., 2001). We conducted initial coding separately for each of the scenarios, but because we were interested in general effects and because reliabilities across scenarios were satisfactory (Cronbach's α ranging from .61 for sadness to .85 for negative emotions), we computed mean scores for self and other across all scenarios.

Results

Analytical Approach

Preliminary analyses compared LIWC2001 scores to reference values from the literature and employed *t* tests to examine whether splitting the file into self- and other-related responses had been successful.

Pearson correlations examined linear relations among age and descriptions of emotions in oneself and others. We used Steiger's $\bar{Z}_1$* statistic (Steiger, 1980) to compare correlations for self- and other-related responses. Hierarchical regressions tested for quadratic age effects and examined whether age effects remained after we controlled for demographic variables.

[3]Note that intraclass correlation scores based on the double-entry method are sensitive to both differences in profile and differences in elevations (Terracciano & McCrae, 2006).

Descriptive Results and Preliminary Analyses

Table 2 shows mean scores on the linguistic markers for self- and other-related responses and for total responses. Average responses to each scenario were about 27 words long. The percentage of words captured by the dictionary was 87.6%, which is above the reference value of 79.9% in the manual (Pennebaker et al., 2001). Mean percentages for positive (6.1%) and negative (7.4%) emotion words were more than double the reference values for emotional writing (2.7% and 2.6%, respectively). This suggests that the instructions successfully elicited responses with a high density of emotional descriptions.

The mean poignancy score was −0.38, suggesting that, generally, participants did not simultaneously describe positive and negative emotions. This score is comparable with the average poignancy score of −0.35 found by Carstensen and colleagues (2000) in a life-span sample. The mean heterogeneity score was 0.46, suggesting that, typically, participants did not describe more than one negative emotion at a time.

Other-related responses had half as many first-person singular pronouns as self-related responses, $t(364) = 27.49$, $p < .001$, but more than three times as many third-person pronouns, $t(364) = 21.88$, $p < .001$, indicating that the split into self- and other-related responses was successful. Self-related responses were also higher in word count, captured words, negative emotions, anxiety, anger, sadness, and heterogeneity, but lower in positive emotions and poignancy [for all comparisons, $t(364) > 3.6$, $p < .05$]. Most likely, mean level differences between self- and other-related responses are driven by the content of the specific scenarios used in the present study. It is important that, even though the scores on linguistic markers differed across self and other responses, all scores were equal to or higher than the reference values in the manual. Thus, there were no floor effects that could have obscured existing age effects.

Age Differences in Descriptions of Emotions

Linear and quadratic associations between age and word count and percentage of words captured did not reach statistical significance; we dropped these variables from further analyses.

To examine age differences in emotional representations, we computed Pearson correlations between the continuous age variable and the linguistic markers of emotion for both self- and other-related responses (shown in Table 3). To test if age effects differed across target persons, we compared each set of correlations by using Steiger's $\bar{Z}_1$* statistic (Steiger, 1980) for dependent correlations (also shown in Table 3). As predicted, age was positively associated with descriptions of positive emotions and negatively associated with descriptions of negative emotions for both self- and other-related responses (Figure 1). Descriptions of anger were negatively associated with age across all targets, whereas descriptions of sadness were not associated with age in self-related responses but were negatively linked to age in other-related responses. This difference in correlations was statistically significant. In contrast, descriptions of anxiety were negatively associated with age in self-related responses but not significantly associated with age in other-related responses, although this difference between correlations did not reach significance.

Advanced age was associated with greater poignancy in both self- and other-related responses, but, in contrast to prior findings, heterogeneity was negatively associated with age and this effect was significantly stronger in self-related responses. Because it is possible that age-related increases in heterogeneity are limited to the most negative scenarios, we recomputed heterogeneity scores based on the five scenarios that four independent raters rated as highly negative (scores < 2 on a scale from 1 = very negative to 7 = very positive). Nevertheless, the negative associations between heterogeneity and age remained significant ($r = -.35$, $p < .001$ for self, $r = -.24$, $p < .001$ for other).

To control for age differences in demographic variables and to test for curvilinear age effects, we conducted hierarchical regressions entering gender, job status, and education in a first step, the centered age variable in a second step, and the quadratic effect of age in a third step. Dependent variables were the linguistic markers of emotions in self- and other-related responses. Standardized coefficients for the second step are shown in the right-hand columns of Table 3. Controlling for demographic variables had little influence on the patterns of effects. The association between advanced age and descriptions of positive emotions was reduced to a trend ($p = .15$ for self and $p = .06$ for other), but all other age effects remained unchanged. The third step examining quadratic effects of age did not reach significance for any of the variables and is therefore not shown.

In a final step, we examined age effects on the differentiation between one's own emotions and those of others. For this purpose, we computed, for each participant, the intraclass correlations (using the double-entry method) between the emotional content of self- and other-related responses across the 20 scenarios.[3] We computed separate scores for positive and negative emotions. Higher scores indicate a greater tendency to attribute similar emotional responses to oneself and others and thus signal lower differentiation. Hierarchical regressions entering centered age in a first step and the quadratic effect of age in a second step found no significant linear or quadratic effects of age on the negative emotions score (βs = .01, *ns*). The tendency to attribute similar levels of positive emotions to oneself and others showed a linear decline with age ($\beta = -.11$, $p < .05$), but no quadratic effects of age ($\beta = .01$, *ns*)

Discussion

To the best of our knowledge, the present study is the first to systematically compare age effects in representations of emotions in oneself versus those in others with regard to global positive and negative emotions, discrete negative emotions, and quantitative indices of blended emotions. The results extend our understanding of life-span emotional development by illustrating that similar effects are found in representations of one's own experiences and those of others.

Consistent with prior research, in our research age was positively associated with descriptions of global positive emotions and negatively associated with descriptions of global negative emotions. Also consistent with previous findings (e.g., Carstensen et al., 2000), blends among positive and negative emotions increased with age in descriptions of both one's own emotions and those of others. Heterogeneity among multiple negative

emotions, in contrast, decreased with age; this effect was significantly stronger in responses pertaining to oneself as compared with those pertaining to others.

It is important to note that, although on a global level emotional representations among older adults were more positive and less negative than those among younger adults, results do not support a uniform positivity bias because effects for discrete emotions differed across targets: Age was negatively associated with descriptions of sadness in others but not in oneself; a tendency in the opposite direction was found for anxiety; and only anger showed consistent declines across both targets.

Theoretical Implications

Life-span developmental theories have proposed different mechanisms that are relevant to the interpretation of our findings. One line of reasoning traces age differences to motivated cognitive control mechanisms that promote emotional well-being (Mather & Carstensen, 2005). Specifically, socioemotional selectivity theory (SST, Carstensen, Isaacowitz, & Charles, 1999) argues that age-related changes in future time horizons result in goal adjustments that lead older adults to prioritize present-oriented and emotionally gratifying goals over goals associated with long-term endeavors. Importantly, the awareness of time limitations is thought to elicit not merely a hedonistic focus toward the positive but also “more complex, poignant, and deeply gratifying emotional experiences” (Carstensen et al., 2003, p. 112). SST is well supported by empirical evidence demonstrating that experimental manipulations of goals and time horizons can temporarily eliminate the focus on positive material and emotionally gratifying social interactions among older adults (Fung, Carstensen, & Lutz, 1999; Löckenhoff & Carstensen, 2007) or elicit it among younger adults (Fung et al.; Kennedy et al., 2004; Mather & Johnson, 2000).

Alternative theoretical approaches focus on age-related declines in complex emotional reasoning. Labouvie-Vief (2003), a prominent proponent of this view, suggests that with the onset of old age, cognitive limitations result in a shift toward schematic processing strategies that focus on affect optimization at the cost of CAC. At the level of emotional processing, CAC is thought to be linked to “blended distinct emotions, especially ones involving positive and negative contrasts” and “clearer differentiation of self from others,” whereas optimization is linked to dampening of negative effect and enhancement of positive affect (Labouvie-Vief, p. 202).

Both theoretical frameworks are consistent with the finding that descriptions of global positive and negative emotions show similar age effects in oneself and others. According to SST, any emotional processing task is susceptible to age-related changes in motivated cognition (Mather & Carstensen, 2005) and the socioemotional reasoning processes involved in attributing emotional experiences to oneself and others should be no exception. In fact, information processing in social contexts may be particularly susceptible to such effects, because advanced age affects not only one’s own time perspective and goal priorities but leads to analogous changes in time perspective and goals for one’s relationships (Löckenhoff & Carstensen, 2002). Similarly, if age differences in emotional representations are due to age-related limitations in emotional reasoning abilities, one would expect to find comparable effects on descriptions of emotions in both oneself and others.

In spite of these similarities across theories, several aspects of the present results are more consistent with a motivational account than with an ability-based explanation. For one, all of the observed age effects are linear. This is consistent with SST, because future time perspective, which is seen as the driving factor behind age differences in motivated cognition, shows linear declines across the life span (Carstensen et al., 1999). The CAC framework, in contrast, would predict a midlife peak in blended emotions and the onset of optimization in old age. We found no evidence of such curvilinear effects. In addition, whereas ability-based accounts would predict that differentiation among one's own emotions and those of others peaks in midlife (Labouvie-Vief, 2003), motivational accounts would argue that—like other aspects of emotional reasoning—differentiation is well preserved into old age (Mather & Carstensen, 2005). Consistent with the latter view, our research showed that the tendency to attribute similar levels of negative emotions to oneself and others did not differ by age, and, for positive emotions, differentiation was positively associated with age.[4] Further, consistent with SST, which predicts that limitations in time perspective are associated with a mix of positive and negative emotions (Ersner-Hershfield et al., in press), our study showed that advanced age was associated with higher poignancy scores in both self- and other-related responses. The CAC framework, in contrast, would have predicted a midlife peak in such emotional blends.[5]

Some of our findings, however, are not entirely consistent with either of the theoretical frameworks. In particular, it is not clear why age effects would differ across individual negative emotions and why we did not find the age-related increase in emotional heterogeneity that had been reported in previous studies (e.g., Charles, 2005). In part, such discrepancies may be due to differences in methodology. Magai and associates (2006), for example, found that advanced age was associated with greater emotional heterogeneity on rating scales, but not in facial expressions or narrative responses.

Our findings also highlight the need to extend existing theoretical frameworks. To better account for differential age effects in specific emotions, the SST framework could be integrated with cognitive appraisal theories that associate each emotion with a distinct appraisal pattern (e.g., Lazarus, 2001). The appraisal that others are accountable for a blockage of one's goals, for example, is thought to elicit anger whereas irrevocable loss is associated with sadness. If the pursuit of future-oriented goals decreases with age, then the appraisal of blocked future goals may be less salient to older adults and this may account for age-related decreases in descriptions of anger. Sadness, in contrast, may remain more stable with age because the inevitable losses associated with aging (e.g., Baltes, 1997) keep this emotion more accessible to older adults, especially when they are describing their own emotions.

[4]Note, however, that the present study operationalized differentiation among one's own emotions versus those of others, as the tendency to ascribe valence-matched emotions to self and others. More complex types of congruence (e.g., feeling afraid in response to perceived anger in the other person) are not captured.

[5]Because SST also predicts that older adults prioritize emotionally close relationships over peripheral ones (Carstensen et al., 1999), we asked four independent raters to classify the social partners, resulting in 9 close and 11 not-close scenarios. After controlling for multiple comparisons, we found no significant differences in linear or quadratic age effects across levels of closeness. However, the present stimuli were not specifically designed to compare levels of closeness, and confounding factors (e.g., scenario content) may have obscured existing effects. Additional studies that systematically vary emotional closeness are needed.

Future research must also identify contextual factors that may moderate age differences in emotional ascriptions. Age differences in social inferences, for example, were previously shown to depend on the type of interpersonal judgment required (i.e., morality vs competence) such that middle-aged and older adults prioritized information with higher diagnosticity for a given trait (i.e., positive information for competence vs negative information for morality; Hess, Bolstad, Woodburn, & Auman, 1999). Conceivably, age differences in emotional ascriptions may show similar variations, depending on whether a given scenario highlights moral issues or competence-related concerns.

Future research should also relate the present results to age differences in physiological responding (e.g., Tsai et al., 2000) as well as broader aspects of life-span psychosocial development such as social network composition (e.g., Antonucci, Akiyama, & Takahashi, 2004) and attachment styles (e.g., Magai, Hunziker, Mesias, & Culver, 2000).

Limitations and Future Research

Our study has several important methodological limitations. First, although findings are more consistent with SST than the CAC framework, we did not assess the underlying factors proposed to drive age differences according to each of the theories (i.e., time perspective and CAC, respectively). Future research should assess these variables and examine their association with representations of emotions in oneself and others. Further, with the exception of heterogeneity, the observed correlations were only small in size. In addition, we used hypothetical scenarios instead of sampling real-life emotional experiences. On the one hand, using a standardized set of situations instead of a relived emotions paradigm was advantageous, because it ensured that all participants responded to the same set of situations. On the other hand, hypothetical scenarios can, of course, never equate real-life experience, and the short outlines used in the present study were somewhat ambiguous and subject to individual interpretation.[6]

Another concern is our reliance on a computer program. Although prior research indicates that the LIWC2001 is a valid and reliable measure to quantify emotional content in verbal material (see the Methods section), scores are relatively simplistic and not sensitive to negations, irony, sarcasm, and contextual factors. Note, however, that we excluded from our study those participants whose answers were identified as ironic during transcription. Supplemental analyses also revealed that the percentage of negations (1.2%) was below the reference value for emotional writing in the manual (2.3%, Pennebaker et al., 2001) and that age was not associated with negation use ($r = .01$, *ns*), suggesting that such effects cannot account for the present results. The LIWC2001 also cannot differentiate between multiple uses of the same emotion word and instances in which unique emotion words from the same category are used. This does not invalidate LIWC2001 scores as a quantitative emotion measure (using the word *sad* three times arguably shows a higher frequency of negative emotions than does using *sad* only once). However, this does reduce sensitivity to complex blends within emotion categories (e.g., *sad* vs *gloomy*). In spite of these shortcomings, it is

[6]For example, some scenarios asked participants to imagine specific individuals (e.g., spouse), who likely differed in age depending on the age of the respondents. Future studies could explicitly manipulate the age of the interaction partner to explore its influence on emotional attributions.

encouraging that the age patterns of emotional representations observed in the present study closely resemble findings from experience-sampling studies and retrospective reports of real-life emotional experiences (Carstensen, et al., 2000; Gross et al., 1997). Nevertheless, the LIWC2001 would not be well suited to measure more complex concepts such as CAC (Labouvie-Vief & Medler, 2002). Although the present study is focused on quantitative emotion ratings and the LEAS items do not elicit the rich self-descriptive statements required to assess CAC, this represents an important direction for future research.

Finally, our study is limited by its reliance on cross-sectional data. Although age differences in linguistic styles are comparable for cross-sectional and longitudinal data (Pennebaker & Stone, 2003), additional studies must examine if the same holds true for the present paradigm. Moreover, participants were well educated and minorities were underrepresented. Because age differences in emotional responses may differ across ethnicities (Charles, 2005), future studies should recruit more balanced samples.

Conclusion

In spite of the limitations just outlined, this study contributes to our understanding of age differences in emotional representations by demonstrating that the positivity effect seen in people's descriptions of their own emotional experiences is also found in their representations of others' emotions. In addition to their theoretical relevance, our findings have important practical implications. On the one hand, a tendency to interpret one's own emotions and those of others more favorably may benefit social relationships by preventing the escalation of conflicts and fueling positive self-fulfilling prophecies. This may contribute to the generally positive quality of intimate relationships among older adults (e.g., Carstensen et al., 1995). On the other hand, overly favorable interpretations of the emotions of others could be problematic, if they obscure warning signs of potential conflict. A better understanding of such dynamics may guide the development of interventions that promote socioemotional well-being across the life span.

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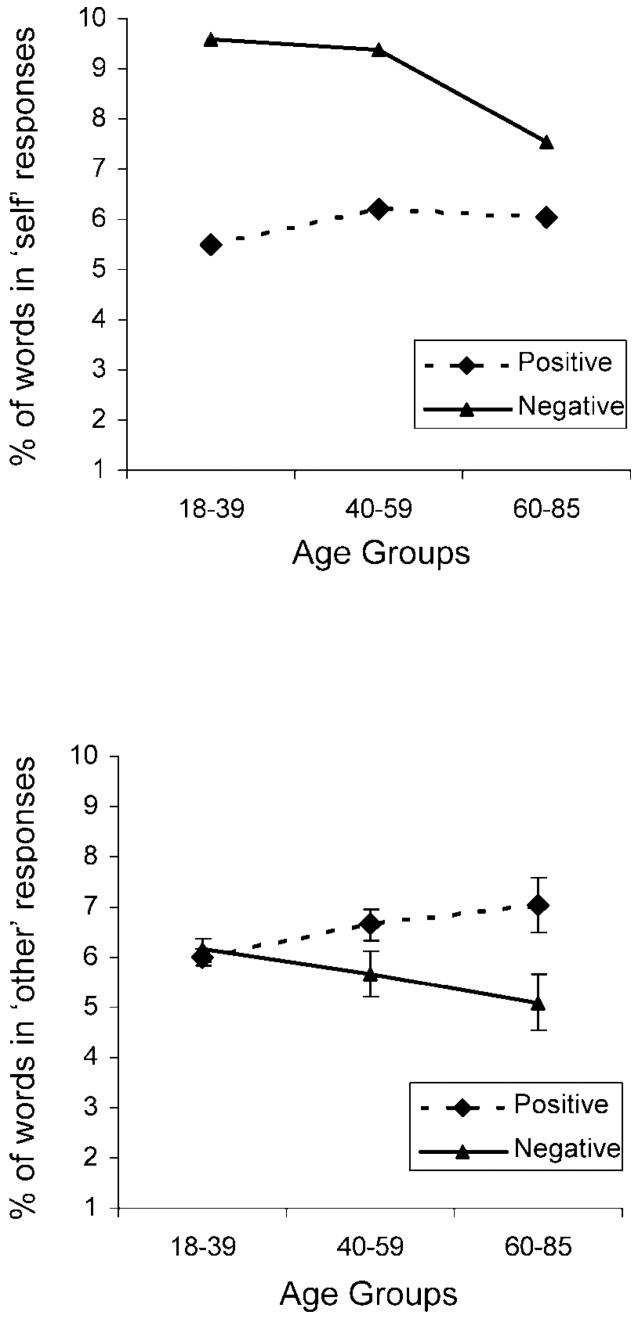

Figure 1.

Linguistic markers of positive and negative emotions—percentages of total words—in descriptions of oneself (top) and others (bottom) by age group. Error bars show standard errors of the mean.

Table 1

Demographic Characteristics by Age Group and for the Sample as a Whole

Characteristic	Total	Young	Middle Aged	Old	*p*
n	367	189	95	83	
Mean age	42.8 (19.2)	27.0 (6.3)	48.5 (5.3)	72.0 (7.2)	<.001
Gender (% female)	51.8	50.3	45.3	62.7	.06
Ethnicity (% Caucasian)	86.0	79.1	89.4	97.6	<.001
Mean SES	2.0 (0.8)	2.0 (0.8)	2.1 (0.8)	2.0 (0.8)	.80
Mean education	14.92 (2.20)	14.74 (1.84)	15.64 (2.44)	14.52 (2.47)	<.001

Note: SES = socioeconomic status. Standard deviations are shown in parentheses; *p* values refer to age differences. Age differences in continuous variables were assessed with one-way analyses of variance and age differences in categorical variables were assessed with χ^2 tests.

Table 2

Mean Scores for Linguistic Markers by Target Person and for Total Responses

	Target Person		
Variable	**Self**	**Other**	**Total**
Data quality			
Word count	14.60 (8.90)	12.91 (6.91)	26.72 (15.80)
% captured	88.01 (4.82)	87.20 (4.40)	87.60 (4.61)
Pronouns			
% FPS	15.20 (4.62)	7.27 (3.32)	11.24 (3.97)
% TS	1.81 (1.24)	6.81 (4.52)	4.31 (2.88)
Emotion			
% positive	5.81 (2.81)	6.41 (3.35)	6.11 (3.08)
% negative	9.06 (5.61)	5.78 (4.13)	7.42 (4.87)
anxiety	2.57 (2.62)	1.82 (2.18)	2.20 (2.40)
anger	2.66 (2.53)	0.71 (0.92)	1.68 (1.72)
sad	2.36 (1.73)	1.31 (1.48)	1.84 (1.61)
Poignancy	−0.40 (0.18)	−0.36 (0.16)	−0.38 (0.17)
Heterogeneity	0.60 (0.27)	0.33 (0.20)	0.46 (0.23)

Note: FPS = first-person singular; TP = third person. With the exception of word count, poignancy, and heterogeneity, scores are reported as percentages of total words. Standard deviations are shown in parentheses.

Table 3

Associations Between Age and Linguistic Markers of Emotional Experience by Target Person

Variable	r_{self}	r_{other}	Z_1*	β_{self}	β_{other}
% positive emotions	.11*	.12*	−0.22	.08	.10
% negative emotions	−.12*	−.11*	−0.13	−.11*	−.11*
anxiety or fear	−.13*	−.05	−1.87	−.13*	−.05
anger	−.15**	−.14**	−0.20	−.16**	−.14**
sadness	.01	−.11*	2.04*	.00	−.12*
Poignancy	.13*	.11*	0.35	.11*	.11*
Heterogeneity	−.37**	−.27**	−2.62**	−.39**	−.29**

Notes: r_{self}, r_{other} = Pearson correlations between age and Linguistic Inquiry and Word Count software markers for self and other; Z_1* = Steiger's (1980) statistic for comparing the dependent correlations between age and linguistic markers for self and other responses; β_{self}, β_{other} = standardized coefficients for the second steps of hierarchical regressions controlling for gender, ethnicity, and education in a first step and entering age in a second step.

* $p < .05$,

** $p < .01$.