Positivity Effects in Older Adults’ Perception of Facial Emotion: The Role of Future Time Perspective

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**Objectives.** We examined age differences in the perception of emotion from facial expressions, testing the impact of future time perspective on positivity effects and emotion complexity.

**Methods.** Perception of emotion was assessed in older (n = 111) and younger (n = 127) adults using facial expressions depicting clearly expressed and ambiguous emotions. A more open-ended judgment paradigm was used, and time perspective was experimentally manipulated.

**Results.** Older adults perceived more positive affect in the expressions compared with younger adults. Ambiguity of the expression modulated these age differences, as older adults perceived more positive emotion in ambiguous expressions compared with younger adults. Emotion complexity emerged only in perception of negative expressions, with older adults seeing more mixed affect in the clear expressions than younger adults. Manipulation of future time perspective eliminated age differences in perception of positive affect.

**Discussion.** Age differences in the perception of emotional expressions showed positivity effects, especially for ambiguous facial expressions. These effects were related to time perspective rather than to age per se. The understanding of the positivity effect in older adults needs to consider the proposed causal role of limited time perspective rather than assuming positivity effects in all older adults.

**Key Words:** Aging—Emotion—Emotion complexity—Perception—Positivity effect.

AGE-RELATED changes in emotion and cognition have become a focus of research as the aging population grows. Early perspectives characterizing later life as a period of declining satisfaction and well-being have largely been replaced by research suggesting that well-being is relatively stable or even more positive in later life (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Charles, Reynolds, & Gatz, 2001; Mroczek & Kolarz, 1998).

Carstensen’s socioemotional selectivity theory (SST) posits that the natural limitations on time that accompany aging trigger a shift in goals in later life (Carstensen, 1995). As such, emotionally meaningful goals like maintaining close relationships become more prominent than information seeking goals of earlier adulthood. Older adults are motivated to monitor their emotions and arrange their environments to optimize their emotional experience.

Researchers also have examined whether older adults demonstrate the proposed impact of limited time perspective in attention and memory. Results have shown reliable age differences such that older adults demonstrate biased attention and recall for positive relative to negative information compared with younger adults (Allard & Isaacowitz, 2008; Charles, Mather, & Carstensen, 2003; Knight, Maines, & Robinson, 2002; Mather & Carstensen, 2003). These age-related shifts in the focus on positive and negative information have been termed the “positivity effect,” which Carstensen and colleagues argue has the potential to improve mood and longer term well-being (Carstensen & Mikels, 2005; Scheibe & Carstensen, 2010).

In addition to positivity effects, researchers have also observed an increase in mixed emotion or co-occurrences of positive and negative affective states in older adults. These age differences in mixed affect, also referred to as poignancy or emotion complexity, have been found in studies of daily emotional experiences (Carstensen et al., 2000; Ong & Bergeman, 2004). Carstensen and colleagues contend that the pursuit of emotionally meaningful goals necessitates more complex emotional states. Researchers have further suggested that interpretations of emotional experience that include both positive and negative emotions may be a feature of adaptive emotional functioning (Carstensen et al., 2000; Labouvie-Vief & Medler, 2002; Mayer & Salovey, 1997), with studies showing an association between emotion complexity and positive characteristics like resilience (Ong & Bergeman, 2004).

Although current evidence suggests that older adults might be receiving emotional benefits from shifting (a) what they attend to, (b) how they selectively retrieve events in memory, and (c) how they appraise their own emotional experiences, relatively little attention has been paid to possible age-related shifts in how older adults perceive emotional information in their environment. Given that attention and memory have been influenced by motivational shifts in aging, it is reasonable to consider that perception of emotion would also evidence similar age differences. The existing literature has explored the related topic of accuracy of emotion recognition in older adults as one aspect of their perception of emotion.
The current literature has explored whether the ability to accurately recognize emotional stimuli remains intact with age and has most frequently been examined using posed facial expressions of specific emotions (Calder et al., 2003; Sullivan & Ruffman, 2004). In general, participants in these studies viewed faces expressing anger, disgust, fear, happiness, sadness, or surprise and were instructed to select one emotion that best described the face from those listed. The number of emotions for participants to select from was limited to the specific emotions being tested in the study, typically from four to six emotions. This body of research has demonstrated small but consistent age differences in the ability to recognize a variety of emotions, with older adults exhibiting reduced accuracy in recognition of negative emotions compared with younger adults (see Isaacowitz et al., 2007 for a review).

Although this research provides information regarding the accuracy of judgments made by older adults when choices are limited and selection is constrained to a single emotion, it does not reveal the potential variability and complexity with which emotional information is perceived. The developmental life-span literature suggests that emotional information processing is adjusted to serve changing goals and that emotions are experienced more complexly than forced-choice paradigms allow for. Therefore, an important next step is to examine how positivity and complexity might affect perception of emotion in the environment.

The Current Study

The current study examined age differences in the perception of emotion from facial expressions. Facial expressions were chosen, as they are arguably one of the most relevant social cues in the environment, and their interpretation can be variable. In an effort to replicate the emotional variety and lack of clarity encountered in daily life, perception of emotion was assessed from faces portraying more ambiguous emotions as well as clearly expressed emotions. Our assessment attempted to capture more complex judgments by reducing the constraints of forced-choice recognition paradigms. This assessment permitted the evaluation of both positivity effects and emotion complexity in older and younger adults’ perception of clear and ambiguous facial expressions. Furthermore, we experimentally manipulated future time perspective in both older and younger adults to test the main tenet of SST and examine its influence on the emergence of positivity effects and emotion complexity in the perception of emotion.

Hypotheses

Hypothesis 1

Based on SST, we predicted a main effect for age such that older adults would demonstrate positivity effects and emotion complexity in their perception of emotion in the facial expressions compared with younger adults. Positivity effects were represented by increased frequency of positive emotions and/or reduced frequency of negative emotions; emotion complexity would be represented by greater frequency of mixed emotion.

Hypothesis 2

However, because ambiguity in emotional meaning allows for greater flexibility in judgment, we predicted an interaction by age and stimulus type. Specifically, we expected older adults to display positivity effects and emotion complexity to a greater degree in their perception of emotion in the ambiguous facial expressions as compared with the clearly expressed emotions.

Hypothesis 3

As previous research has shown younger adults to have a more expanded time perspective and older adults to have more limited time perspective, we predicted that our manipulation (limited perspective for younger adults and expanded perspective for older adults) would result in a reduction of the age differences in the perception of emotion.

Method

Participants

Younger adult participants (n = 127) were recruited from undergraduate psychology classes at the University of Southern California (USC). Young adults ranged in age from 18 to 24 years (M = 19.92, SD = 1.38) with 71% of them being female. Thirty-six percent were non-Hispanic White, 39% were Asian American, 9% were African American, 7% were Latino, and 9% were from other ethnic backgrounds. Young adult participants received extra course credit for participation in the study.

Older adult participants (n = 111) were recruited from the USC Andrus Gerontology Center volunteers and the USC Healthy Minds research volunteers. Older adults ranged in age from 64 to 91 years (M = 75.88, SD = 6.44). Twenty-nine percent of the older adult participants were female, and most (94%) were non-Hispanic White. English language proficiency was determined to be adequate based on the participant’s ability to understand and respond to the initial invitation and subsequent communications regarding scheduling matters.

The groups differed significantly with regard to sex, \( \chi^2(1, N = 237) = 40.65, p < .001 \), ethnicity, \( \chi^2(4, N = 237) = 79.73, p < .001 \), and education, \( t(235) = 12.42, p < .001 \). Older and younger adults did not differ significantly with regard to self-reported health, \( t(235) = 0.61, ns \). See Table 1 for means of demographic information by age group.
Measures

Demographic information.—Personal information on age, sex, ethnicity, education, and self-reported health was obtained from the participants.

Depressed mood.—The Center for Epidemiological Studies–Depression Scale (CES-D; Radloff, 1977) was used to assess the presence of depressive symptoms. The CES-D is widely used in research with adults of all ages, and its reliability and validity have been well established (Radloff, 1977; Radloff & Teri, 1986). The internal consistency for this measure in the current study was $\alpha = .78$ for the older adult group and $\alpha = .86$ for the young adult group. The CES-D asks individuals to indicate on a 4-point scale, with responses ranging from 0 (rarely or none of the time) to 3 (most of the time), how frequently they experienced certain symptoms within the past week. This measure was used to assess for depression and control for it in the analyses, as depressed mood has been shown to affect emotional information processing (e.g., Beevers, Wells, Ellis, & Fischer, 2009; Knight et al., 2002). Younger adults reported significantly more symptoms of depression compared with older adults: for younger adults, $M = 12.27$, $SD = 7.62$; for older adults, $M = 6.69$, $SD = 5.82$; $t(235) = 6.27$, $p < .001$.

Future orientation.—The Future Time Perspective Scale (FTP; Carstensen & Lang, 1996) is a 10-item measure assessing perceived limitations on time. The FTP asks participants to rate on a scale from 1 (completely disagree) to 7 (completely agree) the degree to which they agreed with each of 10 items. Sample items are “Many opportunities await me in the future,” “Most of my life (still) lies ahead of me,” and “I have the sense that time is running out.” The internal consistency of this measure has ranged from $\alpha = .76$ to .92 in prior studies with adults of all ages (Fung, Lai, & Ng, 2001; Lang & Carstensen, 2002; Yeung, Fung, & Lang, 2007). Internal consistency of this measure in the current study was $\alpha = .89$ for the older adult group and $\alpha = .78$ for the young adult group. A total score was created by summing the ratings on all items focusing on an expansive future and the reverse scores of items focusing on a more limited future. Higher scores indicated perception of the future as more expansive relative to lower scores. As expected, younger adults scored significantly higher on the FTP than older adults indicating a more expanded time perspective compared with older adults: for younger adults, $M = 40.38$, $SD = 5.04$; for older adults, $M = 32.63$, $SD = 8.43$; $t(235) = 8.55$, $p < .001$.

Stimuli

Clearly expressed emotions.—The following four clearly expressed emotions were evaluated in this study: happiness, sadness, anger, and fear. Images of facial expressions of these emotions were selected from the collection titled Pictures of Facial Affect (Ekman & Friesen, 1976) (The following photographs from the Picture of Facial Affect were used: happy—MF1-6, JJ4-7, MO1-4, and PE2-12; sad—MF1-30, JJ5-5, MO1-30, and PE5-7; anger—MF2-7, JJ3-12, MO2-11, and PE2-21; fear—MF1-27, JJ5-13, MO1-23, and PE3-21; and neutral—MF1-2, JJ3-4, MO1-5, PE2-4, A1-2, GS1-4, C2-3, EM2-4, PF1-2, JB1-3, SW3-3, and WF2-5.). These photo stimuli are well standardized for their emotional content and have been used extensively in research with young and older adults (e.g., Calder et al., 2003). Photos of four different actors (two males and two females) posing each of the four emotions were selected from this collection.

Ambiguous emotions.—Images of two specific emotions posed by the same actor were morphed or blended to generate a set of ambiguous emotional stimuli. The morphs were generated using FantaMorph 4.0; this software allows for identifying pertinent anatomical areas such as the mouth, eyes, nose, chin, and hairline to use as control areas to facilitate smooth morphing. An important feature of this procedure is that control points are shifted by an equal percentage of the total distance between their initial and final positions. This produces images that morph in 10% increments from the first prototype to the last prototype. The resulting images with 50% of each emotion were used in the current study as this degree of morphing produces the most ambiguity. The
following emotional blends were used: happy/sad, happy/anger, and happy/fear. Morphs were generated on these three continua for four different actors (two male and two female), yielding 12 morphed faces.

Emotion Perception Task

The perception task was performed via a paper and pencil format to allow for data collection in groups as well as to minimize potential confounds that could be introduced by using a computer-based format due to lack of computer knowledge by some older adult participants. Photographs of facial expressions were presented one per page with a list of emotions below each expression. Participants were not limited in the number of emotions they could endorse for a single expression. The average number of emotions endorsed per expression did not differ significantly by age or level of ambiguity (M = 2.18, SD = 0.88). The list of emotions included happy, calm, hopeful, serene, content, excited, angry, fearful, sad, annoyed, bored, nervous, ashamed, embarrassed, worried, and guilty. Additional emotions beyond the four emotions of happiness, anger, sadness, and fear were selected in order to generate a more comprehensive list of both positive and negative emotions. These emotions were selected to be consistent with previous studies examining optimization and complexity in older and younger adults’ appraisals of daily life experiences (Carstensen et al., 2000; Ong & Bergeman, 2004). Several “other” blanks were provided on the response sheet to accommodate other emotions participants could have perceived in the expressions that were not included in the list. Three independent raters coded all write-in responses as positive, negative, or not applicable. Examples of responses coded as positive emotions were amused, peaceful, and proud. Examples of responses coded as negative emotions were frustrated, intimidated, and hopeless. Responses that the coders deemed not emotion terms, like mesmerized and ready, and physical or somatic states, like tired and pain, were dropped from the analyses. Use of the write-in response option was quite low. An average of 3% of participant appraisals were coded from the write-in responses across all expression types, suggesting that the vast majority of the participants were able to characterize their interpretation of the expressions from the emotions and procedures provided in the protocol. Analysis of use of write-in responses revealed a main effect for age such that younger adults utilized the “other” blanks more often than older adults across expression types, F(1, 235) = 9.87, p < .01, \( \eta^2_p = .040 \). Use of write-in responses did not differ by level of ambiguity.

Procedure

Participants were tested in groups ranging from two to eight individuals. After consent procedures, participants completed the demographics questionnaire, the CES-D, and the FTP. After the questionnaires were completed, instructions for the perception task were read aloud. Young adults in the limited time condition were given the following additional instruction: “Imagine that you are a graduating senior, and today is the last day that you will be a student at USC. Tomorrow you will be leaving Los Angeles and your life as a college student is coming to a close.” Older adults in the expanded time condition were given the following instruction: “Imagine that last week you found out from your doctor about a new medical advance that insures you will enjoy 20 more years beyond the age you expected to live, in reasonably good health.” Both groups of participants in the experimental condition were instructed to: “Keep this new perspective in mind while you judge the following facial expressions.” We did not create a comparable situation for participants in the control condition to imagine, as even seemingly benign situations like imagining your last trip to the grocery store or what you ate for breakfast can introduce confounds to the experiment. As such, we chose to read the instructions for the task and then insert the manipulation, which took an additional 60–90 s to complete, ensuring that the only difference between the groups would be the brief induction procedure. All participants completed the task independently. No time limit was set for this task, completion time ranged from 20 to 40 min. Although the potential for biased responding was introduced by the presence of the primary researcher and/or research assistants for protocol administration, the nonsensitive nature of this study reduces the likelihood that participants’ responses were influenced by social desirability concerns.

As assignment to condition was by group as opposed to by individual, we analyzed baseline differences across the two conditions for both older and younger adults. No significant differences were found in the demographic, depression, or FTP measures across conditions. See Table 1 for participant demographics and baseline measures.

Analytic Plan and Data Reduction

We analyzed the data using repeated measures analysis of variance with two between-subjects factors, age (young, old) and time perspective (control, manipulation), and one within-subjects factor, ambiguity (clearly expressed—low, morphed—high).

To examine our specific hypotheses, we derived indices of positive and negative affect for the two levels of ambiguity by first calculating the individual frequencies of positive and negative emotion terms endorsed for each category of expression (clearly expressed or morphed). We then divided the frequency by the number of expressions in the corresponding category in order to account for the varying number of stimuli in each category. The index of mixed affect was similarly derived by tallying the number of expressions from each category that received endorsements of both positive and negative affect. This frequency was then divided
by the number of expressions in the corresponding category to account for the discrepant number of stimuli per category.

Due to results of previous research revealing differences in the processing of positive and negative stimuli, the clear expressions of positive and negative affect comprising the low level of ambiguity were analyzed separately. As such, we conducted two sets of analyses of variance, first examining the positive clearly expressed (comprised happy expressions) and morphed expressions and then examining the negative clearly expressed (comprised sad, angry, and fearful expressions) and morphed expressions. Level of education and CES-D score were entered as covariates in all analyses.

All participants completed the protocol according to instructions resulting in a complete data set. Two participants’ data were excluded from the analyses due to an improper administration of the FTP induction. All other participants’ data were included in the analyses.

**RESULTS**

We present our results in three sections. The first section reports the findings from the analyses of age differences indicative of positivity effects and emotion complexity across the various facial expressions (Hypotheses 1 and 2). The second section reports the findings regarding the influence of future time perspective on the emergence of positivity effects and emotion complexity (Hypothesis 3). The third section reports the analysis of confounding variables. Standard error bars are used on all figures.

**Age Differences in Positive and Negative Affect—Evidence of Positivity Effects**

*Clearly positive and morphed expressions.*—We found a significant Age × Ambiguity interaction effect for perception of positive affect, $F(1,231) = 7.02, p = .009, \eta^2_p = .030$, with the effect of age emerging at the high level of ambiguity. Although both older and younger adults perceived less positive affect in the morphed expressions than the clearly positive expressions, older adults perceived more positive affect in the morphed expressions compared with younger adults (see Figure 1). A significant main effect for ambiguity was found for perception of positive affect, $F(1, 231) = 4.57, p < .05, \eta^2_p = .019$. All participants perceived negative affect in the expressions similarly, with the ambiguous expressions receiving more endorsements of negative affect than the clearly positive expressions.

*Clearly negative and morphed expressions.*—We found a significant Age × Ambiguity interaction effect for perception of positive affect, $F(1,231) = 8.32, p = .004, \eta^2_p = .035$. Although both older and younger adults perceived more positive affect in the morphed expressions than the clearly negative expressions, older adults perceived more positive affect in the morphed expressions compared with younger adults (see Figure 2). We found a significant main effect for age for perception of negative affect, $F(1, 231) = 5.17, p < .05, \eta^2_p = .022$. Older adults perceived less negative affect in the expressions overall compared with younger adults.

**Age Differences in Mixed Emotion—Evidence of Emotion Complexity**

No significant effects were found for age or level of ambiguity in the analysis of perception of mixed affect in the clearly positive and morphed expressions. There was a significant main effect for age for perception of mixed affect in the clearly negative and morphed expressions, $F(1, 231) = 7.92, p < .01, \eta^2_p = .033$. However, this main effect was clarified by a significant Age × Ambiguity interaction, $F(1, 231) = 16.02, p < .001, \eta^2_p = .065$ (see Figure 3). The effect of age was greatest for the low level of ambiguity, with older adults...
perceiving significantly more mixed affect in the clear expressions of negative emotion than younger adults.

**Effect of Time Perspective Manipulation on Positivity Effects**

Effects for the time perspective manipulation were found only for the perception of positive affect, no effects for negative affect or mixed affect were found.

_Clearly positive and morphed expressions._—We found a significant between-subjects interaction effect of Age × Time Perspective, $F(1, 231) = 7.32, p < .01, \eta^2_p = .031$, such that for older adults, the amount of positive affect they perceived in the expressions was dependent on the time perspective condition (see Figure 4). When induced into an expanded time perspective, older adults perceived significantly less positive affect in the expressions compared with their counterparts in the control group. In contrast, younger adults induced into a limited time perspective perceived similar amounts of positive affect compared with those in the control group. The manipulation future time perspective served to eliminate age differences in the perception of positive affect.

_Clearly negative and morphed expressions._—We found a significant Age × Time Perspective interaction effect in the perception of positive affect, $F(1, 231) = 4.80, p < .05, \eta^2_p = .020$. Additionally, we found a significant three-way interaction of Ambiguity × Age × Time Perspective, $F(1, 231) = 5.40, p < .05, \eta^2_p = .023$. Although both older and younger adults perceived more positive affect in the ambiguous expressions compared with the clear expressions, the increase from clear to ambiguous expressions was dependent on age and time perspective (see Figure 5). Older adults in the control group showed the greatest increase in positive affect from the clear to the ambiguous expressions; however, when induced into an expanded time perspective, they perceived significantly less positive affect in the ambiguous expressions compared with their counterparts in the control group. Younger adults’ perception of positive affect remained relatively unchanged when they were induced into a limited time perspective.

**Analysis of Confounding Variables**

**Sex.**—As 71% of the younger adult sample comprised female participants compared with 29% of the older adult sample, the data were reanalyzed using sex as a predictor variable. Sex was not found to be a significant predictor for positive affect, negative affect, or mixed affect in any of the facial comparisons.

**Ethnicity.**—Due to the significant disparity in ethnic composition of the older and younger adult samples, we reanalyzed the younger adult sample comparing the Asian American participants ($n = 47$) with the non-Hispanic White
participants \((n = 44)\). Results showed two significant Ethic ﬂexibility in the comparison of the clearly positive and morphed faces. The Asian American sample yielded steeper slopes compared with the non-Hispanic White sample due to Asian Americans’ slightly higher rates of positive affect for the clearly positive faces and slightly lower rates for the morphed faces, \(F(1, 88) = 5.99, p < .05, \eta^2_p = .064\), and their higher rates of negative affect for the morphed expressions, \(F(1, 88) = 8.22, p < .01, \eta^2_p = .085\). As the latter finding may have contributed to the significant main effect for age in the perception of negative affect, we compared the non-Hispanic White younger adults with the non-Hispanic White older adults and found no significant differences in the perception of negative affect. Therefore, the significant main effect for negative affect will not be interpreted in the discussion as the finding appears to be driven by age group differences in ethnicity.

**Discussion**

In summary, our study revealed that older adults do indeed exhibit positivity effects and emotion complexity in their perception of emotion from facial expressions, with effects dependent on ambiguity of the expression. As predicted, older adults exhibited a positivity effect in their perception of the ambiguous expressions. Contrary to our predictions, older adults exhibited increased emotion complexity in their perceptions of the clear expressions of negative emotion when compared with younger adults. Older adults’ increased emotion complexity for the clearly negative expressions could be viewed as further evidence of a positivity effect, as older adults perceived some positive emotion along with the negative. Furthermore, their lack of increased emotion complexity when the expression truly is mixed, opting for a more positive interpretation, also appears to be in line with a general tendency toward positivity. Rather than showing emotional complexity by being more attuned to mixed emotions present in the stimuli, older adults perceived a relatively consistent amount of complexity in the clearly negative and ambiguous faces. Young adults, in contrast, responded to the complexity of the stimulus and perceived as much complexity as did older adults when complexity was present in the stimulus. This finding suggests that the positivity effect is strong among older adults and overrides accuracy in perception of emotion.

Although future orientation has been manipulated in previous research, those studies explored the influence of time perspective on the saliency of personal relationships and choices individuals make regarding those relationships. To the best of our knowledge, this study is the first to examine the effects of an experimental manipulation of time perspective on emotional information processing. Manipulating older adults’ time perspective to a more expanded perspective served to reduce the emergence of positivity effects in their perception of emotion. Although it seems paradoxical that a seemingly positive thought like living 20 years longer for a person in older adulthood would result in decreased perception of positive affect, our findings that positivity effects were eliminated by expanding older adults’ time perspective is consistent with SST. That is, an expanded time perspective reduces the motivation for focusing on maintaining a positive mood and allows older adults to more fully process negative affect in the environment. This finding drives home the point, sometimes glossed over in research on emotion and aging, that it is the shortened time perspective presumed to be associated with advanced age that drives the positivity effect, not age per se.

The results for the manipulation of younger adults’ time perspective, on the other hand, were inconclusive. Limiting younger adults’ time perspective did not have a significant effect on their perception of emotion. Although the manipulation procedure utilized had been successful in prompting the sense of an approaching ending in previous work with younger adults (Ernsner-Hershfield, Mikels, Sullivan, & Carstensen, 2008), its lack of effectiveness was likely due to differences in our sample characteristics. We did not specifically recruit graduating seniors, as was done in the aforementioned study. Based on years of completed education, less than 50% of the current sample was nearing graduation, and thus potentially reduced the effectiveness of the manipulation. Nonetheless, the effects of time perspective manipulation have not been examined in perception of facial emotion with young adults, with existing research on time perspective among young adults focusing on choice of social partners and internal emotional states rather than cognitive processes (Carstensen et al., 2000; Fung, Carstensen, & Lutz, 1999). The current study raises questions regarding the influence of time perspective on information processing in younger adults, as well as the possibility that positivity effects in cognition depend on both age and limited time perspective. Further exploration into the effect of time perspective on younger and older adults’ information processing is warranted to determine if the pattern of results found in perception of emotion is replicated in attention and memory.

**Limitations**

This study has certain limitations that should be taken into consideration. First, the study lacked a direct manipulation check for the time perspective induction. Whereas some studies have used a subset of the FTP scale items as a manipulation check, we felt that, given the brevity of the induction procedure, a pre- and post-measure of FTP would prime the participants to the nature of the manipulation and potentially introduce demand characteristics. Second, the manipulation for younger adults was not effective in limiting younger adults time perspective. Although this procedure was used in past research, our study suggests that these priming statements are only effective in eliciting shifts in young adults’ time perspective when the scenario is more...
current for them, like when they are actually approaching the end of their undergraduate career. Additionally, the manipulation procedures are not well matched, with one referencing the end of a life stage and the other referencing the end of life. Future research might explore the effectiveness of prompts referencing shortened life expectancy with younger adults.

Concerning the facial stimuli, older adults were under-represented among the actors portraying the facial expressions. In experimental research on the influence of poser age on emotion recognition, perceptual accuracy scores were not affected in young, middle-aged, and older adults (Moreno, Borod, Welkowitz, & Alpert, 1993). Although older adults demonstrated positivity effects and emotion complexity in the perception of the middle-aged and younger adult expressions used in the study, we cannot be certain that this pattern of results would emerge if the posers had been old. Furthermore, the use of standardized stimuli prohibited the examination of other expressions of positive emotion, as most stimulus sets do not include depictions of more nuanced expressions of positive emotion.

The use of USC alumni for the majority of the older adult sample was intended to provide a more equivalent comparison group for the younger adult sample composed of USC students. This strategy resulted in large differences between the groups in both ethnicity and sex, with the older adult sample comprising mostly non-Hispanic White males. The current SST literature has not found sex and ethnicity to be influential in its reported age by valence interactions (e.g., Charles et al., 2003). Our analyses were mostly consistent with this trend; however, we did observe one difference with regard to perception of negative affect in this sample of Asian American young adults who had a meaningful impact on the results. As such, future studies should explore sex and ethnic similarities and differences more specifically and use sampling strategies that will improve generalizability of findings.

Conclusions

The present study represents an important contribution to the study of age differences in the processing of emotional information. We found that older adults demonstrated positivity effects and emotion complexity in their perception of emotional information. These findings are consistent with past research while also expanding these age differences to another domain of information processing. The current findings also further confirm SST by demonstrating that future time perspective does play a direct role in the observed age differences in perception of emotion. Therefore, not only do older adults demonstrate changes in what they attend to and how they recall emotional information but also in their perception of emotion encountered in the environment. Although the age-related shifts in perception observed in this study cannot be directly linked to emotion regulation, it is possible that when taken together with changes in attention and memory, these changes in information processing contribute to improvement in mood and well-being.

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References


