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Unpleasant Situations Elicit Different Emotional Responses in Younger and Older Adults

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Abstract

Older adults report less distress in response to interpersonal conflicts than do younger adults, yet few researchers have examined factors that may contribute to these age differences. Emotion regulation is partially determined by the initial cognitive and emotional reactions that events elicit. We examined reported thoughts and emotions of younger and older adults ($N = 195$) while they listened to three different audio-taped conversations in which people were ostensibly making disparaging remarks about them. At four points during each scenario, the tape paused and participants engaged in a talk-aloud procedure and rated their level of anger and sadness. Findings revealed that older adults reported less anger but equal levels of sadness compared to younger adults, and their comments were judged by coders as less negative. Older adults made fewer appraisals about the people speaking on the tape and expressed less interest in learning more about their motives. Together, findings are consistent with age-related increases in processes that promote disengagement from offending situations.

Keywords

emotion; emotion regulation; age differences; social situations

Older adults are adept at regulating their emotions in social situations, reporting fewer arguments and interpersonal tensions overall (Birditt & Fingerman, 2005), experiencing fewer conflicts with spouses (Levenson, Carstensen & Gottman, 1993), and often generating better solutions to interpersonal dilemmas than younger adults (Blanchard-Fields, 2007). These findings are based primarily on age differences in memories and behavioral preferences in response to interpersonal conflicts (e.g., Blanchard-Fields, 1999). Few studies have examined age differences in reported emotions and cognitions as the events unfold, yet there is growing reason to expect that age differences emerge early in the regulatory process. In laboratory experiments, older adults direct their attention away from negative stimuli (Mather & Carstensen, 2003) and recall fewer negative stimuli relative to younger adults (Charles, Mather & Carstensen, 2003), a phenomenon referred to as the “positivity effect” (Carstensen & Mikels, 2005). Older adults may deploy similar strategies during caustic situations. Age differences in

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the degree to which people appraise negative aspects of a conflict situation may partially explain why older adults report lower levels of distress in response to unpleasant social encounters.

Age differences in response to interpersonal problems

Older adults report fewer negative interpersonal interactions than do younger adults (Almeida, 2005; Almeida & Horn, 2004). When they do occur, older adults recall lower levels of anger and overall affective distress in response (Birditt & Fingerman, 2005; Birditt, Fingerman, & Almeida, 2005). In a study examining communication patterns while people discuss a topic of disagreement, older couples express fewer negative emotions and behaviors than middle-aged couples (Carstensen, Gottman, & Levenson, 2004); similarly, older mothers report less negative affect than their adult daughters when the two are queried after completing a cooperative laboratory task (Lefkowitz & Fingerman 2003).

When reporting emotions experienced during interpersonal conflicts, younger adults are more likely to report higher levels of anger -- an emotion associated with action-oriented strategies -- than older adults. In contrast, older adults often report higher levels of sadness, an emotion consistent with passive responses, than younger adults. For example, older adults reported less anger when recalling previous interpersonal conflicts (Lefkowitz & Fingerman, 2003) and reported less anger and more sympathy in response to the transgressions of others than did younger adults (Weiner & Graham, 1989). In another study, older and younger adults viewed videotaped scenarios depicting negative social interchanges a woman experienced during her transition to a nursing home. Participants were asked to guess the feelings of the protagonist after she was treated rudely by others and to recommend a coping strategy in response to each situation. Younger adults were more likely to report that the woman was feeling angry, whereas older adults were more likely to report that she was feeling sad (Charles, Carstensen, & McFall, 2001). In addition, older adults were more likely to suggest passive strategies for the woman, such as ignoring the problem, than were younger adults. And, they stated that these passive strategies were the optimal strategies to use in such circumstances.

Older adults, more so than younger adults, report engaging in passive strategies more often when recalling prior negative social interactions in their own lives as well. They report often doing nothing or letting the situation pass, consistent with goals to preserve harmony in the relationship (Lefkowitz, & Fingerman, 2003). This more passive response relates specifically to interpersonal conflicts with network members; Blanchard-Fields and her colleagues have found that older and younger adults are equally likely to report engaging in action-oriented strategies in response to instrumental problems not involving their close social network members (Blanchard-Fields, Stein, & Watson, 2004; Blanchard-Fields, Jahnke, & Camp, 1995). When coping with highly emotional interpersonal situations, however, older adults prefer emotion-regulation strategies as opposed to problem-solving actions more often than younger adults.

Socioemotional selectivity theory posits that older adults are not withdrawing from these experiences as a passive signal of defeat, but as a proactive strategy for the purpose of emotion regulation (Carstensen, Fung, & Charles, 2003). According to the theory, age is related to the realization that time left in life is growing shorter. As a result of this decreasing time horizon, older adults focus their goals on strategies to enhance emotional regulation goals. These goals take precedence over information-seeking goals, such as meeting new people or discovering information about a tense interaction. According to this theory, older adults are motivated to reduce the time and energy spent on negative experiences, particularly unpleasant social events.

Age differences in the content of the cognitive appraisals

Directing attention away from negative situations is an effective emotion regulation strategy aimed at reducing the intensity of a negative emotional experience (Campos, Frankel, & Camras, 2004; Scheier & Carver, 1977). In studies examining attention to affective stimuli, older adults are more likely to shift their attention away from negative stimuli and toward positive stimuli; younger adults do not show this bias (Isaacowitz, Wadlinger, Goren, & Wilson, 2006; Mather & Carstensen, 2003). The degree to which people attend to a negative event is predicted to partially explain why older age is related to lower levels of negative affect and quicker recovery from negative mood states (Carstensen et al, 2003). Moreover, this emotion regulation strategy is hypothesized to play a central role when navigating social interactions to maintain close and meaningful social ties (Carstensen et al., 2003; Gross, Carstensen, & Fung, 1998).

Researchers have examined age differences in appraisals of affective stimuli (Hess & Auman, 2001; Hess, Osowski, & Leclerc, 2005), but no research to date has examined immediate cognitive appraisals when people are confronted with information that arouses negative emotions. Cognitive appraisals are evaluations of stimuli related to emotional experience (Levine, 1996) and are implicated in the etiology and maintenance of anxiety and depressive disorders (Barlow, Allen & Choate, 2004; Beck, 1967; 2002). Examining age differences in appraisals of negative information may help explain why older adults are less reactive to these situations, and why well-being is preserved and sometimes enhanced in late life (e.g., Charles & Carstensen, 2007).

The current study

Although a rich body of research suggests that older and younger adults differ when evaluating stimuli that vary in emotional complexity (see reviews by Blanchard-Fields, 1999; Labouvie-Vief, 2003), to the best of our knowledge no study has examined age differences in cognitive appraisals during aversive situations. The current study examined the reported emotions and appraisals of older and younger adults who were placed in aversive social situations in the laboratory. Appraisals refer to evaluations people are making about any aspect of the current situation, including the people speaking, the self, or the situation in general. In this study, participants imagine that they are overhearing two people who are insulting them. Based on prior studies (Charles et al., 2001; Weiner & Graham, 1989), we hypothesized that older adults report less anger in these situations than younger adults, but that older adults report higher levels of sadness than do younger adults. Consistent with the positivity effect (Carstensen & Mikels, 2005), we hypothesized that older adults make fewer appraisals about the offending situation, specifically the people talking about them, compared to younger adults. Also based on the positivity effect, we further hypothesized that the appraisals of older adults are less negative and more positive than those of younger adults. We also examined the desire to gain further information about the negative experience. Governed by socioemotional selectivity theory, we hypothesized that younger adults are more likely to mention a desire to receive more information regarding the reasons for the negative comments they are hearing compared to younger adults.

Method

Participants

The sample was comprised of 195 adults ($n = 97$ younger adults, $M_{age} = 24.82$, $SD = 3.59$, Range = 18–40; $n = 98$ older adults, $M_{age} = 70.90$, $SD = 4.39$, Range = 63–86). We included people in their twenties and thirties in the young adult group to avoid oversampling people who are college aged and often used in studies of age differences. The older age group spans

approximately the same number of years. To avoid potential confounds between health and age-related processes, we only included people who reported being in good physical health. Thus, an eligibility requirement was that participants had to rate their health as the same or better than most people their age. Age groups were stratified almost equally between men and women (48% and 52% respectively) and among those with a history of blue-collar (55%) and white-collar (45%) employment. Two-thirds of the sample consisted of European-Americans and one-third were African-Americans. All participants were San Francisco Bay Area residents and were recruited over the telephone by a marketing research firm to participate in a one-hour study examining people's responses to overheard conversations. Participants were given a small monetary compensation for their time.

The younger and older age groups did not vary significantly on reports of somatic complaints, with means of .72 ($SD = .51$) and .58 ($SD = .52$), respectively, $t(193)=1.91$, $p = .06$, perhaps not surprising considering the health-related eligibility criterion. One older and one younger adult did not complete the health questionnaire. Years of education did not vary significantly between the younger ($M = 14.99$, $SD = 3.22$) and older ($M = 15.29$, $SD = 2.39$) adults. Concerning two measures of cognitive ability – Vocabulary and Digit Symbols subtests of the WAIS-R—the age groups did not significantly vary in their vocabulary scores, $M = 49.12$, $SD = 12.19$, and $M = 48.70$, $SD = 11.52$, for young and old, respectively. Older adults, however, scored significantly lower on the digit symbol task ($M = 40.88$, $SD = 12.00$) than the younger adults ($M = 65.63$, $SD = 12.19$), $t(193) = 14.30$, $p < .001$, consistent with prior literature on age reductions on performance tests (Salthouse, 1994).

Measures

The study paradigm, Articulated Thoughts in Simulated Situations (ATSS; Davison, Navarre, & Vogel, 1995; Davison, Vogel, & Coffman, 1997; Rayburn et al., 2007), uses a talk-aloud methodology that taps on-going cognitions to assess thoughts and emotional reactions to stimuli (see review by Davison, 1997; Rayburn et al., 2007). This procedure is theoretically grounded by the work of Lazarus (1984) and Beck (2002) which maintains that people's appraisals of current events shape their emotional experiences. The ATSS paradigm was first used to assess differences in cognitive appraisals and emotional reactions among participants diagnosed as socially anxious compared to non-anxious controls (see review by Davison et al., 1997), but this paradigm has been used successfully to examine other processes as well, using diverse samples that have included eight year-old children (O'Brien, Margolin, John & Krueger, 1991), adolescents (e.g., Rayburn et al., 2007) and psychiatric adult in-patients (White, Davison, Haaga, & White, 1992).

In the current study, participants are given written instructions which state that people often have a constant stream of thoughts or feelings about what is happening around them. The instructions describe how they will listen to three different tape-recorded conversations. For each conversation, they will listen to four different segments, each one followed by a tone and then a 30-second pause. Upon hearing the tone, they are to rate on a coding sheet how angry and sad they feel, using a Likert-type scale from 1 (not at all) to 7 (extremely) for each emotion (a modification for the current study). Then, participants are to say out loud whatever is going through their mind until they hear another tone, at which time the conversation will continue.

The experimenter describes the context for the tape-recorded situation prior to playing each one. One scenario asked participants to "imagine that you are at a family member's house. You are in the kitchen getting something to drink, and you overhear two of your close family members talking about you in the other room. Again, you know that they are talking about you." This scenario included comments about how boring the conversation of the target (participant) was and how badly they dressed. Another scenario was introduced with the instructions, "I want you to imagine that you are at your doctor's office, sitting in an examining

room waiting for the doctor to enter. The doctor has told you that your glucose levels are high, so you know that you have a medical condition that needs to be treated. You overhear your doctor and another doctor talking together outside of the examining room. They are talking about you". In this scenario, the doctors discuss how they doubt the person's ability to change his/her diet and exercise routine, and how this person cannot be trusted. The medication, with its potentially bad side effects, seems like the best choice given the ability of the patient.

Another scenario was introduced with the following instructions, "I want you to imagine that your family owns a business and you really want to help out in this business. You are at a family member's house, and you overhear two of your family members talking about you in the next room. You know they are talking about you." In this conversation, people hear their "family members" discuss how they doubt that the participant can be trusted and be responsible. All scenarios were designed specifically for this study and used actors (one female and one male) who were in their mid-forties. Different tapes were made for male and female participants with the only difference being the use of pronouns (e.g. she or he). Each scenario lasted almost two minutes, not including the 30-second pause intervals.

Initial pilot work established that these scenarios elicited both anger and sadness among younger and older adults. From this pilot work, these scenarios were selected from other, less successful alternatives. For example, pilot work revealed that older adults were not interested in the opinions of strangers, and only well-known social partners elicited strong feelings from older adults. Only one person was unable to follow the protocol; this younger adult had just purchased a new home and was too distracted to focus on the study.

The scenarios were designed for the current study to apply to both younger and older adults, but issues from these scenarios may vary in salience with age. For example, two of these scenarios included issues related to competence, such that the doctors wondered about the ability of the participant to engage in the proper health behaviors, and family members in the business scenario were concerned about the competence of the participants to work effectively, voicing concerns about his/her motivation and ability to be relied upon. Because competence is often associated with negative age stereotypes (Pinquart, 2002) and thus may be a more sensitive issue for older adults, we statistically controlled for this possibility in our analyses by including a variable (competence), coded as either including (1) or not including (0) issues of competence. In addition, the scenarios varied according to family member versus non-family members (i.e., physicians). Because older age is associated with greater preference to spend time with close friends and family members (Carstensen, 2006) and more positive experiences with these family members (Charles & Piazza, 2007) we controlled for the effects of scenarios by including a variable (familiarity) in our analyses that indicated whether the scenario did (1) or did not (0) include family members.

For each scenario, we examined possible age differences in the mean number of words used during each talk-aloud interval. Across intervals in all scenarios - the Doctor's office, Family Business, and Family Dinner - older adults spoke using significantly fewer words, averaging 45.99 words ($SD = 16.23$; $SE = 1.67$) across scenarios compared to an average of 54.66 words, ($SD = 17.98$, $SE = 1.65$) for younger adults, $t(193) = 3.54 = p < .001$.

Procedure

All participants were interviewed individually at either the Stanford Psychology Department or in a private office at a downtown San Francisco survey research firm. Following informed consent and the completion of a brief demographic questionnaire, participants read the instructions. Afterwards, the experimenter verbally described the procedure and answered any questions. To familiarize them with the procedure, participants were given a practice tape for which they were told to imagine themselves in a grocery store, inadvertently hearing two people

talking in front of them. The two people discussed their dinner plans and grocery list. Several participants tended to focus on the content of the conversation they heard (e.g., repeating what they heard), and we directed them to focus on their own thoughts and feelings. By the end of the practice tape, all participants understood the procedure and were able to voice their thoughts and feelings.

Then, participants responded to the three scenarios, with the order counterbalanced across the participants. During the playing of each scenario, the experimenter left the room so the participant could listen and respond to the situation privately. The experimenter would re-enter the room after each scenario to describe the next one. All participants listened and responded to all three scenarios. Responses were lost, however, if people spoke too softly or were difficult to understand, or if a technological difficulty occurred where the recorder failed to work properly, the tape ran to the end and stopped in the middle of a response, or another problem occurred that made the transcription impossible. From the entire sample, data for all 12 responses were collected for 91% of the participants. Data for 11 of the 12 responses were collected for another 7.0% of the sample, and the remaining 2.0% ($n = 4$) of the sample yielded useable data for 8 ($n = 1$) or 10 ($n = 3$) of the possible 12 responses. Because multi-level models allow inclusion of people with incomplete data, all participants were included in these analyses.

After these tasks, each participant completed the Wahler Health Symptoms Inventory (Wahler, 1973), a survey of the frequency of 42 physical symptoms, and The Wechsler Adult Intelligence (WAIS-R) Vocabulary and Digit Symbol subscales which assessed verbal and performance skills. These questionnaires were included to provide additional descriptive detail for the younger and older age groups.

Coding of oral responses

Responses were tape-recorded and later transcribed. Different research assistants from those who transcribed the audiotape coded the responses. Although hearing oral responses may have aided in the coding for the expressed emotionality, we were concerned that older and younger voices would be interpreted differently. Older adults often speak slower than younger adults (Smith, Wasowicz, & Preston, 1987), and emotional tone is related to speech rate (Siegman & Boyle, 1993). In addition, gender and age have both been related to vocal tone features (An Xue & Deliyski, 2001; An Xue & Fucci, 2000). For these reasons, coders rated the transcribed responses to ensure that these factors did not bias coding.

To test the hypothesis that older adults would make fewer appraisals about the offending situation, specifically the people talking about them, and that these appraisals would be more positive and less negative, coders rated the degree to which participants made appraisals about the people speaking. Appraisals refer to evaluations of the current situation. Appraisals about the people speaking included such comments as “This person doesn’t know what she is talking about” as opposed to appraisals focusing on the environmental context or about one’s own personal attributes that may have elicited these comments. In addition, coders rated both the negativity and positivity of these comments. Each of these questions was rated along a scale ranging from 0 (none) to 4 (very much). For example, an appraisal such as “They are not pleased with my behavior” would be scored a 0 for negativity, whereas a comment such as “Who do they think they are? They don’t deserve to sit next to me” would be scored a 4. Positive appraisals about the speakers generally comprised inferences about the positive qualities of the people talking despite their negative comments. They included, for example, statements regarding how these people are smart and capable, and therefore it is surprising to hear them speak this way, or that these comments are unusual to hear, because the speakers are generally kind to family members.

We additionally examined self-appraisals. Self-appraisals refer to evaluations about their own actions and thoughts. We did so to rule out the possibility that older adults were engaging in rumination and negative self-appraisals instead of engaging in appraisals about the other people. To test this potential alternative explanation for our findings, coders rated the degree to which appraisals were about the self, and the negativity and positivity of these appraisals on a 0 (none) to 4 (very much) scale.

We had hypothesized that younger adults would express more anger and possibly stronger emotions in response to these situations than would older adults, and we were interested in examining this question not only using self-reports from the participants but also more objective ratings to obtain a multi-method assessment of emotional experience. For this reason, coders rated the overall negative emotional tone of the participants' responses. This assessment was not limited to anger or sadness but included any type of expressed emotion (such as anxiety or concern). These ratings were not tied to specific appraisals, but rather the overall emotional tone of the entire response regardless of what or who the people were appraising. For example, a response of, "This is such a painful experience. I really can't believe I must endure this" would be rated high in negative emotionality even though the participant did not make specific appraisals about the people speaking or about themselves.

Finally, we had hypothesized that, based on socioemotional selectivity theory, younger adults would want to continue to be engaged in this situation by seeking further information about the people or the cause of their comments more than would older adults. As a result, coders rated the degree to which they spontaneously requested information, such as how did these people come to think that about me? All responses were coded on a Likert-type scale that ranged from 0 (not at all) to 4 (very much).

Two coders unaware of the hypotheses rated all responses for each of the three scenarios. The responses were identified by a subject number and not by any identifying information, such as age or gender. A different pair of coders scored the family dinner scenario than those who scored both the family business and doctor scenarios. Reliability coefficients, assessed by the intraclass correlation between the two raters for each item for the appraisal questions and Kappa for the information questions, ranged from .71 to .87. Coding rarely varied by more than 1 point, and when they did the coders recoded the response, which usually produced similar responses or responses that did not vary by more than one point. For each remaining coding discrepancy, the mean of these recoded responses was used in the analyses.

Analyses

Multilevel, or hierarchical linear models (HLM; Bryk & Raudenbush, 1992) using SAS Proc Mixed (SAS, 2005) estimated fit indices of unstructured variance/covariance matrices by REML. HLM was used to allow for between-subject and within-subject variation using multiple responses per individual (Singer, 1998; Singer & Willett, 2003). By examining multiple responses from each individual as opposed to summarizing scores within-person or selecting one random response per person to examine between-subject differences, we were able to control for covariates for each response as well as gain a more reliable estimate of these responses and changes in these responses over time.

Our lowest level of analysis (Level 1) included aspects that varied across each response, including the intensity of sadness and anger, appraisal ratings, and the timing of the response (whether the response was first, second, third, or fourth in the series). Because a greater number of words may spuriously inflate age differences, we included the number of words uttered for each response. We also included Level 2 covariates, including familiarity and competence, allowing us to examine how these aspects of the scenarios may have influenced the responses. Finally, these scenarios were nested within individuals (Level 3), and we included gender and

the variable to test our hypothesis: age. We used age group as a class (dichotomous) variable in our models. Because we had people representing an expanse of ages, we also re-ran all analyses using age as a continuous variable in case curvilinear effects were present in early or late adulthood, but the results were essentially unchanged. Only analyses using age group (young/old) are reported.

To test each hypothesis, we followed the same four-step procedure. First, we determined whether a two or three-level model fit the data better for the intercept only, fully unconditional model. In all models, a three-level model was a better fit to the data (differences between two- and three-level models for each dependent variable are not reported in the study but may be obtained from the authors). We then entered all of the covariates and age to the three-level model. We then followed with exploratory analyses. We explored whether patterns of age differences varied by time (age by time interaction), and whether age differences in reactions varied according to qualities of the scenario (competence or familiarity).

Results

Hypotheses Regarding Reported and Expressed Emotions

Anger—We hypothesized that older adults would report less anger than younger adults. In the model, between-subject effects accounted for 48% of the variance, scenario-related effects accounted for 25% of the variance, and within-subject effects accounted for 27% of the variance. As predicted, older adults reported lower levels of anger. All covariates were significant, such that women reported higher levels of anger, people who used more words reported higher levels of anger, non-family members aroused higher levels of anger, and issues of competence aroused higher levels of anger. Time was also significant, such that anger increased after the first response and remained high thereafter. No interactions between age and time or qualities of the scenarios were significant. Results of the final models for anger and all other emotion-related outcomes are presented in Table 1.

Sadness—For sadness, 45% of the variance was accounted for by between-subject effects, 28% of the variance was explained by scenario-related effects, and 27% of the variance was accounted for by within-subjects effects. Contrary to the hypothesis, the main effect of age was not significant. Within the covariates (word, time, familiarity, competence, and gender), time and characteristics of the scenario were each significant; people increased their sadness ratings after the first time point and remained stable thereafter. In addition, scenarios with family members and scenarios where people's competence was questioned elicited greater levels of sadness. An exploration of potential interactions with age revealed a significant time by age group interaction. Graphing these age differences revealed that within all three scenarios, older adults consistently increased in levels of sadness throughout the four time points, whereas the younger adults followed the pattern observed with the main effect of time: increasing after the first response and remaining relatively stable thereafter (see Figure 1). In addition, although both younger and older adults reported greater sadness in scenarios that included family members, this difference was greater among the younger adults.

In another model, we explored the association between anger and sadness with age with anger as the outcome variable. Anger and sadness were significantly related to one another, $\beta = .45$ (.03), $p < .001$, and age group was also related to anger, $\beta = 1.88$ (.20), $p < .001$. A significant sadness and age group interaction, $\beta = -.28$ (.04), $p < .001$, revealed that for younger adults, anger was rated higher than sadness. For older adults, self-reported anger and sadness levels did not differ from one another (Figure 2).

Overall levels of negative emotionality—In the model for overall level of emotionality (rated by the coders), between-subject effects accounted for 28% of the variance, scenario-

related effects accounted for 20% of the variance and within-subject effects accounted for 52% of the variance. Similar to the age-related hypotheses for anger, we again predicted that older adults would express less negative emotionality than younger adults. Results confirmed the hypothesis: younger adults were rated as more emotional than older adults.

Gender, time and number of words were each significant predictors among the entered covariates. Women were rated as significantly more emotional than men, emotionality increased significantly after the first time point, and people who spoke using more words were rated as more emotional. Patterns of emotionality over time did not vary by age, nor did the characteristics of the scenario have differential effects by age.

Cognitive Appraisals

Appraisals about the speakers—We had hypothesized that older adults would make fewer appraisals about the speakers than would younger adults, and that these appraisals would be more positive and less negative. In a three level model examining overall appraisals about the speakers, between-subject variance accounted for 24% of the variance, scenario-specific effects accounted for 16% of the variance, and within-subject variance accounted for 60% of the variance. As predicted, younger adults made significantly more of these appraisals. Examining the covariates, men made significantly fewer appraisals about the people speaking; the appraisals increased over time; responses with more words included more appraisals; and people made more appraisals about the other people when scenarios included competence issues. Table 2 presents the final models for analyses examining cognitive appraisals.

Positive appraisals about the speakers—Participants only made positive appraisals about the speakers in 6.4% of the responses, or 149 out of 2317 coded responses. Of the 86 individuals who made any type of positive comment, more than half (54%) made one such comment, and another 29% only made two of these comments. As a result of this low base rate, we examined whether older adults were more likely to report any such positive comments than were younger adults. Across the entire sample, a significantly greater percentage of older adults (52%) reported any positive comments compared to the percentage of younger adults (36%), $\chi^2(1,194) = 5.04 p = .03$.

Negative appraisals about the speakers—In a model examining the level of negativity of the appraisals, 25% of the variance was accounted for by between-subject effects, 18% by scenario specific effects, and 57% by within-subject effects. The hypothesis predicting less negativity among older adults than younger adults was confirmed; age group was a significant predictor. To provide an example of this age difference, one older adult commented that, “You cannot please all the people all the time.” In contrast, a younger adult said, “How dare they say that about me! They are family, and what gives them the right?” Among the covariates, women made significantly more negative appraisals. Responses with a greater number of words were also rated as more negative, and scenarios that included issues of competence elicited less negative appraisals. In addition, the first response contained less negativity than subsequent responses. We also explored whether age differences in reported anger (results described above) would be statistically mediated by these cognitive appraisals. Anger and negative appraisals were significantly related to one another, but appraisals did not mediate the association between anger and age.

Appraisals about themselves—Because we had hypothesized that older and younger adults would vary in their appraisals of others, we wanted to rule out the possibility that older adults instead made a greater number of negative self-appraisals. Age was unrelated to the degree to which people made self-appraisals and the extent to which these comments were positive or negative.

Desire for information—We examined the degree to which people spontaneously mentioned that they wanted more information regarding the situation, their own actions that may have elicited these responses, or information regarding the thoughts of other aspects of the people talking. These comments were raised in less than half of all responses, or 38% of the time. Because most of the responses were 0, we did not use multi-level modeling. Instead, we averaged each person's responses to derive one score for the amount of information they had mentioned across all of their responses, and log10 transformed the scores to control for the skewed distribution due to low base rates and low mean levels for the majority of the people. One younger person and 9 older adults never commented about wondering or being curious about any aspect of the situation across the responses and were thus not included in the analyses. When looking at the level of this response across the age groups for people who reported at least some curiosity, younger adults scored higher than older adults, $t(184) = 2.05, p < .05$.

Discussion

Older adults report less distress and reactivity to interpersonal conflict (Almeida, 2005; Birditt et al., 2005), but few studies have examined immediate emotional reactions at the time the events take place that may explain these differences. The current study examined age differences in emotional responses and cognitive appraisals when people were asked to imagine that they were overhearing unpleasant social information. As hypothesized, older adults made fewer appraisals about the aversive situation (the people speaking), expressed less negativity to the emotion-provoking stimuli, and reported less anger in response.

Emotional response

Across the four response times for each scenario, younger adults reported higher levels of anger than older adults. Appraisal theorists interpret anger as a response to a blocked goal (Levine, 1996). A person who overhears insulting comments directed towards them may feel angry because he or she wants to be regarded with respect and approval, or at least neutrally. Negative comments represent an impediment to this goal. These caustic comments may be particularly frustrating for younger adults. With age, older adults may be more ready to accept the situation, understanding the complexity and ambiguity of life. Lower levels of anger among older adults are also consistent with prior research examining emotional responses to interpersonal stressors (Charles et al., 2001; Lefkowitz & Fingerma, 2003).

Anger is also associated with perceived power to change a blocked goal, with greater anger signaling greater perceived power and control (Levine, 1996). We did not ask about people's perceived ability to change the situation and thus cannot rule out the possibility that age-related decreases in perceived control may be driving these findings. Looking at reports of both sadness and anger, however, suggest that power may not completely explain these differences in self-reported emotions. Sadness is the dominant response when people are in helpless situations (Levine, 1996), yet older adults reported anger and sadness with equal intensity. Unfortunately, the nature of the open-ended responses did not allow for the coding of responses based on blocked versus abandoned goals, but future issues can address this question. We attempted to indirectly assess how much participants focused on the goal by assessing the extent to which their appraisals focused on the speakers and the extent to which they sought information about the situation. We interpreted higher levels of appraisals about the speakers as an indication that participants are engaging with the problem. However, although appraisals were related to anger as expected according to appraisal theories of emotion (Levine, 1996), they did not account for the age differences in anger.

In contrast to anger, sadness was reported with equal intensity among both older and younger adults. Older adults are not immune to social conflict, and although prior research has found that older adults experience negative interpersonal exchanges less frequently than younger

adults (Birditt et al., 2005), interpersonal arguments are nonetheless a source of psychological distress among older adults (Rook, Sorkin, & Zettel, 2004). Patterns of change over time indicated that older adults increased their ratings of sadness throughout each scenario. One interpretation of these findings is that older adults try to avoid the offending stimuli initially, consistent with other studies showing age-related differences in the tendency to withdraw from negative experiences (e.g., Birditt & Fingerman, 2005). When they cannot avoid such situations, however, the repercussions of prolonged exposure may be worse for older adults relative to younger adults. These findings suggest that older and younger adults vary in the timing of emotional experiences in response to aversive events, an understudied area of research in emotion and aging.

The combined reports of sadness and anger also revealed different patterns with age. Older adults reported similar levels of these two emotions. The experience of co-occurring emotions has been documented previously among people of all ages (Larsen, McGraw & Cacioppo, 2001; Ong & Bergeman, 2004). In the present study, however, only older adults reported similar levels of both emotions, whereas younger adults reported significantly greater levels of anger than sadness. This age-related pattern of findings is consistent with previous research showing that younger adults report a hierarchy of emotions, experiencing one dominant emotion in response to unpleasant stimuli. Older adults, in contrast, report a more heterogeneous emotional experience, with no one emotion dominant over the others (Charles, 2005; Magai, Considine, Krivoshekova, Kudadjie-Gyamfi, & McPherson, 2006).

Researchers have argued that experiencing one dominant emotion, often defined as a more differentiated emotional experience, is more adaptive (Barrett, Gross, Christensen, & Benvenuto, 2001). Emotions are functional, and primary, discrete emotions signal a specific response, such as anger signaling the fight response and fear eliciting a flight response. Experiencing multiple emotions, then, would inhibit a quick, specific response. Studies examining age differences in response to problems often find that older adults engage in less active problem-solving styles than younger adults, and instead opt for strategies focused on emotion regulation or cognitive reappraisal (Blanchard-Fields et al., 2004; Charles et al., 2001). According to emotion theorists (e.g., Zajonc, 1984), emotions experienced in response to these events may partially explain these behavioral differences. We do not, however, interpret more heterogeneous emotional experiences as necessarily less functional for older adults. Old age often represents a time of decreased reserve capacity; perhaps slower reaction times allow more time for appraisals, allowing older adults to opt for less active solutions that conserve reduced energy reserves. Future research will have to explore this possibility.

Cognitive appraisals

Focusing attention away from negative information is included in descriptions of emotion regulation strategies (e.g., Campos et al., 2004). Socioemotional selectivity theory posits that because older age is related to increased motivations to maintain emotional well-being, older adults are more likely to focus away from negative stimuli compared to younger adults (Charles et al., 2003; Mather & Carstensen, 2003; 2005). Findings in the current study are consistent with this theoretical basis and with prior research; older adults made fewer inferences about the thoughts and actions of the people making disparaging comments. In addition, older adults did not infer greater negative attributions to themselves, as there were no age differences in the degree to which people made negative self-appraisals. By not engaging in appraisals concerning the transgressors, people may ruminate less about the inferences and actions of others.

Age differences in cognitive appraisals may also have implications for memory. Memory studies that include affective stimuli reveal that younger adults recall and recognize negative stimuli better than positive stimuli; the memories of older adults are more positive (Charles et

al., 2003). Autobiographical memory similarly is more positive for older adults than for younger adults (Comblain, D'Argembeau, & Van der Linden, 2005; Kennedy, Mather, & Carstensen, 2004). Currently, it is unclear whether older adults use memory biases when recalling negative social events, or whether age differences occur at the time of encoding. Fewer appraisals of a negative event may lead to poorer encoding and consequent memory for this event. In contrast, forming appraisals about the event and thinking about the details may lead to a more in-depth encoding and processing and better memory as a result.

Fewer appraisals about the content and people in these negative social interchanges may also lead to a less complex evaluation of the situation, perhaps a result of lower cognitive capacity. Labouvie-Vief and her colleagues (see review by Labouvie-Vief, 2003) have found that older adults exhibit lower levels of cognitive complexity to emotional stimuli. This lower level of cognitive complexity is further related to increased levels of well-being (Labouvie-Vief & Medler, 2002). Reduced complexity may be damaging in situations that require careful weighing of positive and negative information when making important decisions (Lockenhoff & Carstensen, 2004), and messages that are more positive may receive undue attention (Fung & Carstensen, 2003). Still, when information does not have to be deeply processed for important health or economic decisions, avoiding and disengaging from negative information may provide advantages for affective well-being (Carstensen et al., 2003).

Desire for information

Participants were instructed to speak their internal thoughts, not pretend to address the speakers. Perhaps for this reason, very few people spontaneously voiced a desire to engage these people for more information. When looking at this low base rate phenomenon, however, age differences emerged. A greater percentage of younger adults reported these types of comments compared to the older adult group. This finding is consistent with the tenets of socioemotional selectivity theory, which state that younger age is related to a greater focus on information-related goals (Carstensen, Isaacowitz, & Charles, 1999). Younger adults weight social partners by the information gained from interactions from them to a greater extent than older adults (Fredrickson & Carstensen, 1990), who instead focus on the emotional value of these interactions. The findings in this study suggest that age differences exist not only in the importance of information for how people perceive social partners, but also in how they appraise on-going social experiences. Of course, these are hypothetical social interactions and not actual interactions. Although this procedure has been used to infer and predict emotional response to actual situations (e.g., Rayburn et al., 2007; see Davison et al., 1997), this study is inferring what may be occurring in actual situations and not observing them directly.

Limitations

The current study revealed age differences in cognitive appraisals for negative stimuli. Appraisals are the hallmark of cognitive behavioral therapies for affective disorders, suggesting that these thoughts determine consequent emotional functioning. Findings indicate that older adults make fewer appraisals about the offending people than do younger adults. Although the open-ended response format allowed people the freedom to voice whatever they chose, thoughts are often fleeting and difficult to capture in words. Some thoughts might not have been vocalized and lost as a result. Additional studies using more structured questionnaires would yield responses from all participants as well as the power to examine differences in specific types of appraisals rather than only those vocalized. The vocalizations, as well, may have influenced their experience, and we did not examine emotional experiences absent this talk-aloud procedure but think this is an interesting question for future research.

Findings were based on self-report and may fail to capture other aspects of emotional experience. In addition, only one type of negative social experience was examined in the study.

Also, cohort differences may exist in the willingness to expression emotions, such that older adults may feel less comfortable in reporting anger than other types of emotions for these imaginary scenarios. In prior studies older adults have reported higher levels of anger than younger adults (Charles, 2005), but age differences in self-report remain a possible explanation. Age differences in willingness to participate, or in the ability to engage in studies requiring engaging in hypothetical situations was also not empirically tested. We expanded the talk-aloud time to 30 seconds as opposed to the 10–15 that is normative for the ATSS paradigm to accommodate any slower response times that aging may entail. The ATSS paradigm has been used successfully among differing samples who may not have the same level of functioning as community dwelling adults, including eight year-old children (O'Brien et al., 1991) and adult psychiatric in-patients (White et al., 1992). Still, this is the first application to an older adult sample. In addition, although our hypotheses are built on a theory predicting linear changes in cognitive and emotional processes with age, inclusion of a middle-age group would allow further support that these age differences follow a linear pattern. Finally, the study was informed by a life-span developmental theory, but only longitudinal analyses will allow us to confirm that age differences are a result of developmental trends as opposed to cohort effects.

Conclusion

Researchers have examined age-related differences in attention (Mather & Carstensen, 2004), decision-making (see Mather & Carstensen, 2005), brain activation (Mather et al., 2004), and memory (Charles et al., 2003) for emotional information. The current study examined cognitive processes regarding appraisals about negative stimuli. In addition to serving emotion regulation at the time the events occur, this immediate disengagement may be one reason why memories for interpersonal arguments are less negative among older adults than younger adults. Memories depend on current appraisals, but they also depend on encoding processes that occur at the time the event takes place. Until now, it was unclear whether age differences existed at the time a negative situation was experienced, or only afterwards when people recalled such events. Findings from the current study suggest that age differences in how people regulate their emotions and actions in response to negative social exchanges occur immediately at the time of the provoking events, and that older adults are adept at employing cognitive appraisal strategies during stressful situations.

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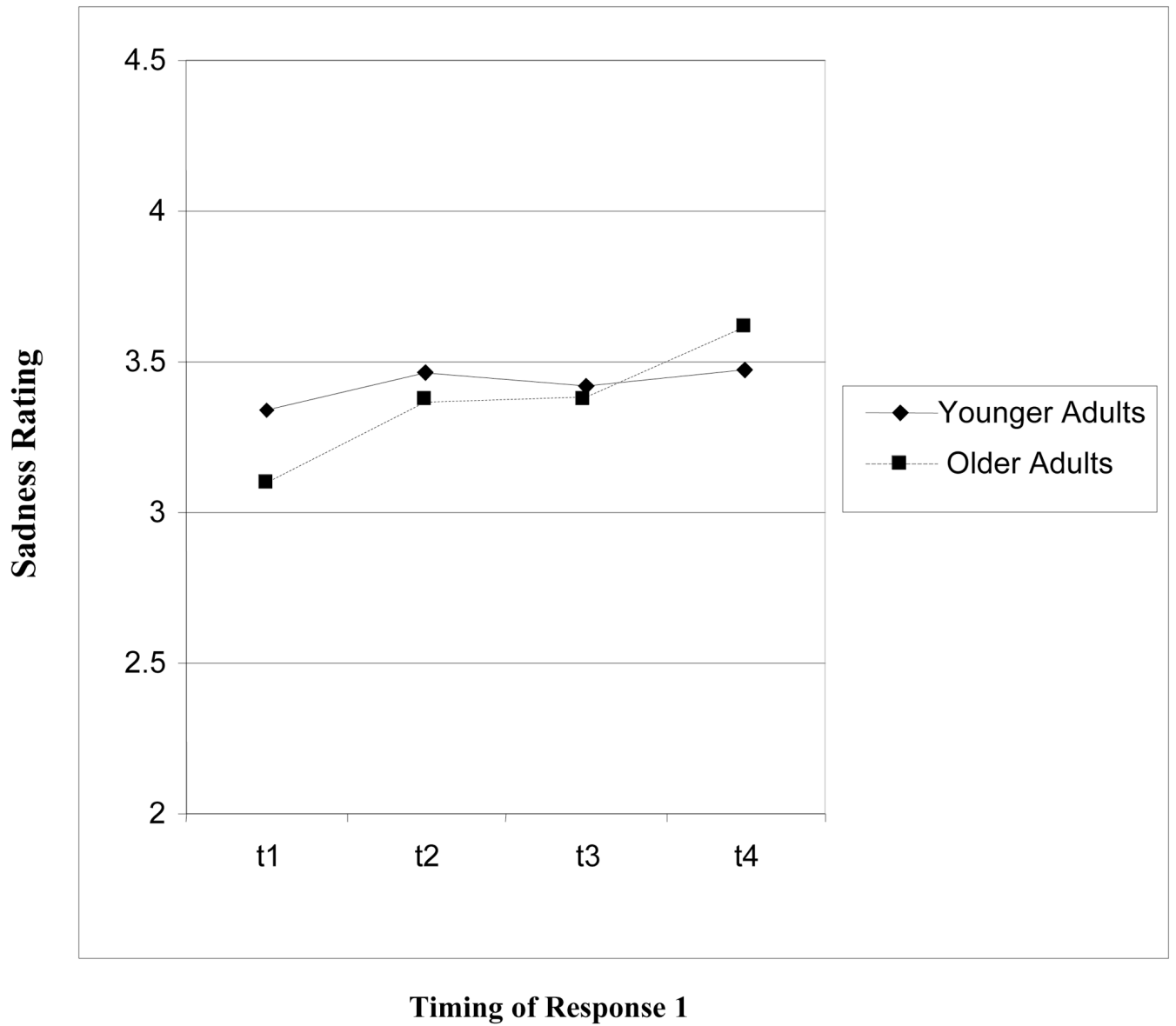


Figure 1. Reports of sadness, aggregated across the three scenarios and estimated using multi-level models.

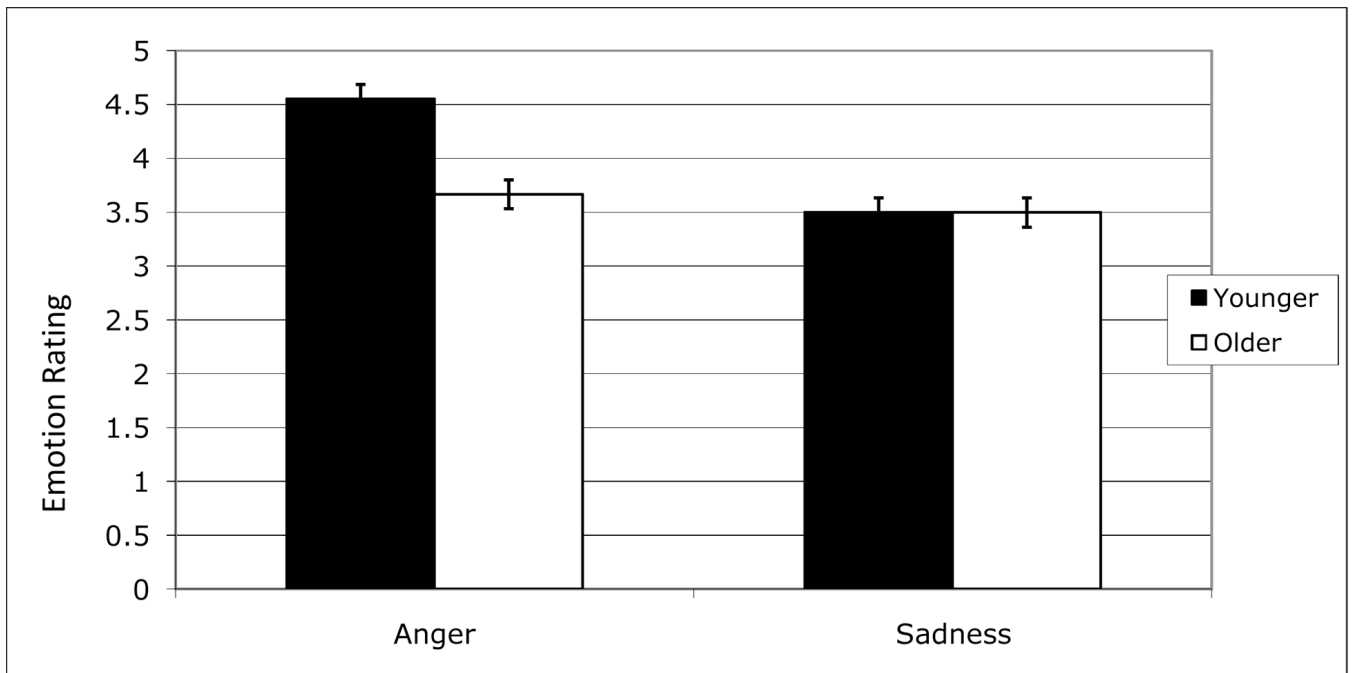


Figure 2. The estimated means for self-reported anger and sadness for older and younger adults, derived from multi-level means models.

Table 1
 Multi-Level Modeling Results Predicting Levels of Anger, Sadness and Overall Expressed Emotionality

Outcomes:	Anger			Sadness			Overall Emotionality		
	B	SE	B	SE	B	SE	B	SE	
Time	.18**	(.02)	-.14**	(.06)	.10**	(.02)			
Number of Words	.004**	(.001)	.002	(.001)	.01*	(.001)			
Familiarity	.034**	(.10)	-.62**	(.12)	.13**	(.02)			
Competence	.71**	(.10)	.30*	(.12)	-.12	(.07)			
Gender	.62**	(.21)	.34	(.22)	.29	(.08)			
Age	-.78**	(.21)	-.40	(.24)	-.55**	(.08)			
Age × Time	-	-	.15**	(.04)	-	-			

* *Note.* $p < .01$

** $p < .001$.

B = Standardized Beta.

Table 2

Multi-level Modeling Results Predicting the Amount of Focus on Self, Overall as Well as Degree to which these Comments were Negative

Outcomes:	Reference: Self		Reference: Negative	
	B	SE	B	SE
Time	.04**	(.02)	.11**	(.02)
Number of Words	.02**	(.001)	.001**	(.001)
Familiarity	.08**	(.07)	.07**	(.08)
Competence	-.19**	(.07)	-.22*	(.08)
Gender	.14**	(.08)	.25	(.10)
Age	-.35**	(.08)	-.58	(.10)

* *Note.* $p < .01$

** $p < .001$.

B = Standardized Beta