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Age differences in affective forecasting and experienced emotion surrounding the 2008 U.S. presidential election

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Abstract

In everyday life, people frequently make decisions based on tacit or explicit forecasts about the emotional consequences associated with the possible choices. We investigated age differences in such forecasts and their accuracy by surveying voters about their *expected* and, subsequently, their *actual* emotional responses to the 2008 U.S. presidential election. A sample of 762 Democratic and Republican voters aged 20 to 80 years participated in a web-based study; 346 could be re-contacted two days after the election. Older adults forecasted lower increases in high-arousal emotions (e.g., excitement after winning; anger after losing) and larger increases in low-arousal emotions (e.g., sluggishness after losing) than younger adults. Age differences in actual responses to the election were consistent with forecasts, albeit less pervasive. Additionally, among supporters of the winning candidate, but not among supporters of the losing candidate, forecasting accuracy was enhanced with age, suggesting a positivity effect in affective forecasting. These results add to emerging findings about the role of valence and arousal in emotional aging and demonstrate age differences in affective forecasting about a real-world event with an emotionally-charged outcome.

The 2008 U.S. Presidential Election was a deeply emotional event for millions of people across the United States. Voters on both sides of the aisle argued vehemently that the outcome would have a profound impact on their lives. In the months leading up to the election both private and public discussions included comments about voters' anger and hope regarding the candidates as well as the outcomes of the election. These emotional reactions and forecasts seem to have had considerable impact on voting behavior (Finn & Glaser, 2010). In this study we investigated age differences both in people's forecasts about future affective states and the accuracy of such forecasts in the face of the actual emotional experience. By studying forecasts and experiences in Republicans and Democrats, the election provided a natural experiment in which the same public event was emotionally charged in diverging ways. Based on evidence of age differences in emotional processing and experience, we examined whether older people would forecast and experience more positive and calm states than their younger counterparts regardless of political affiliation. We further examined whether older people would be more accurate when forecasting future

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emotions. Below we provide a review of emotional changes that unfold across adulthood and consider the possible implications for affective forecasting and experience.

Emotional Experience Across Adulthood

Among the most reliable changes in emotional experience across adulthood is increasing positivity in experience and cognitive processing (see Scheibe & Carstensen, 2010 for a review). Studies suggest that older adults experience more positive and fewer negative emotions in daily life compared to younger adults (Carstensen et al., 2010; Charles, Reynolds, & Gatz, 2001) and are more effective than younger adults at regulating their emotions (Gross et al., 1997; Kafetsios, 2004; Phillips, Henry, Hosie, & Milne, 2008; Scheibe & Blanchard-Fields, 2009). Socioemotional selectivity theory (Carstensen, 2006) proposes that positive age trajectories are related to changes in time horizons and associated shifts in the motivation to regulate emotional well-being. As people advance in age and time left in life is perceived as more constrained, emotion-regulation goals are prioritized relative to knowledge-acquisition goals. Tests of hypotheses derived from the theory show that older adults focus relatively more on positive than negative information while processing information and appear to be less responsive to negative stimuli than younger adults on a neural and physiological level (Cox, Aizenstein, & Fiez, 2008; Mather & Carstensen, 2003). For example, many studies suggest that older adults attend to and remember relatively more positive and less negative material (Mather & Carstensen, 2005). A study examining self-reported affect and neural reactivity during the anticipation and receipt of small monetary gains and losses (Samanez-Larkin et al., 2007) suggests that older adults experience diminished anticipation of losses relative to younger adults, while gain anticipation is equivalent in younger and older adults. Such patterns have been termed the “positivity effect” (Mather & Carstensen, 2005).

In addition to positivity, several recent studies point to the possibility that in most contexts of daily life, emotional experience may be less arousing at older ages. Older adults report lower levels of sensation seeking and surgency than younger adults (Lawton, Kleban, Rajagopal, & Dean, 1992). Physiological responding, in particular heart rate reactivity, is relatively reduced in laboratory studies of emotional reactivity (Uchino, Birmingham, & Berg, 2010). Importantly, in situations of high negative arousal, age differences can reverse and systolic blood pressure reactivity tends to be larger with age (Uchino, et al., 2010). Research also suggests that older adults limit their exposure to stressful, high-arousal situations in everyday life and thus more typically experience lesser arousal than their younger counterparts (Charles & Piazza, 2009). Findings from two recent studies suggest that positive and calm emotions (e.g., serene) are most commonly reported by older adults and negative and highly arousing emotions (e.g., anger) are least often reported (Kessler & Staudinger, 2009; Ross & Mirowsky, 2008). A related finding is that older adults experience highly arousing stimuli as less pleasant and/or more aversive than younger adults (Gavazzeni, Wiens, & Fischer, 2008; Grühn & Scheibe, 2008; Keil & Freund, 2009). The goal of this study was to examine how changes in emotional processing, preferences, and experience affect people’s affective forecasts, that is, their inferences about their future affect.

Affective Forecasting Across Adulthood

In everyday life, people frequently make judgments about the affective impact of future events. Affective forecasts are important components of decision making and emotion regulation because they guide people toward options and situations that they expect will influence them in desirable ways and away from those that will influence them in undesirable ways (Loewenstein, 2007; Mellers & McGraw, 2001). Affective forecasts are

hypothetical judgments, or inferences, about future states. To make such judgments one must often go beyond one's current experience and instead rely on semantic knowledge, including situation-specific beliefs about what kind of emotions are typically elicited in particular situations and identity-related beliefs about the levels and kinds of emotions that one generally experiences (Robinson & Clore, 2002). Of course, affective forecasts are not always correct. Although people are usually quite accurate in predicting whether or not a future event will make them feel good or bad, they err in estimations about the intensities and durations of their emotional reactions (Wilson & Gilbert, 2005). Emotional consequences of most events are less intense and briefer than people expect. One prominent view offered by Wilson and Gilbert (2005) is that affective forecasting errors occur because people overestimate the impact of a target event, ignoring other events happening in their lives (focalism), and underestimate their emotion-regulatory capacity when dealing with negative events (immune neglect; Wilson & Gilbert, 2005).

To date, studies on affective forecasting have been conducted almost exclusively with younger adults. It is unclear whether older adults forecast the same emotional responses to future events than younger adults, and whether they share younger adults' limitations in making accurate affective forecasts. Given the significant changes in emotional experience across adulthood, with trends towards positivity and less activation, older adults might expect to experience more positive and low-activated emotions and less negative and high-activated emotions than younger adults in response to future positive and negative events. Additionally, given older adults' heightened attention to emotional well-being, better emotion regulation, and more extensive life experience, one may expect them to be more accurate in predicting their emotions compared to young adults. Through repeated exposure to emotional situations throughout life, individuals may have learned to put focal events in perspective along with other ongoing events and to account for emotion-regulatory processes. However, given the age-related positivity effect in information processing (Mather & Carstensen, 2005), there is also the possibility that improvements may be limited to predictions about positive events. If older adults avoid thinking about negative experiences in order to maintain well-being, remember past negative experiences more positively than they were, and fail to anticipate fine-tuned anticipation of negative events, forecasting accuracy for negative events may not benefit from experience. Thus, it remains unclear whether affective forecasting accuracy should be generally superior among older adults or, instead, be specific to positive events.

So far, only two studies examined age differences in affective forecasting (Kim, Healey, Goldstein, Hasher, & Wiprzycka, 2008; Nielsen, Knutson, & Carstensen, 2008). In a monetary incentive delay task, young and older adults were equally accurate in predictions about the valence of their emotional reactions when winning or losing small amounts of money (Nielsen, et al., 2008). Older adults expected to feel – and did actually feel – equally as positive as young adults after gaining money, but they expected to feel – and did actually feel – less negative after losing money. However, older adults were more accurate than younger adults in predicting their experience of arousal after both gains and losses. In another study (Kim, et al., 2008), young and older adults were given the opportunity to choose among four products of everyday life (e.g., mug, flashlight) and forecasted how satisfied they would be with their choice later on. There was no evidence for age differences in affective forecasting: The two age groups were equally accurate in predicting their future satisfaction with their choice. In sum, the small extant literature on aging and affective forecasting has relied on experimental studies involving simple choices between objects or small monetary amounts and results are equivocal. In this study we chose a widely shared and meaningful event to further investigate age differences in affective forecasting.

The Present Study: Affective Forecasting About an Emotionally Charged Political Event

We investigated the existence of age differences in affective forecasts and affective reactivity in the context of the 2008 U.S.A. presidential election. The election offered an excellent opportunity to study affective forecasting because it represented a shared, emotionally charged and highly salient event that was positive for some people (Barack Obama supporters) and negative for others (John McCain supporters). Moreover, the outcome of this event was uncontrollable and not fully predictable to individuals, thus extending previous laboratory studies on this issue (Kim, et al., 2008; Nielsen, et al., 2008). We collected data 3 to 5 weeks before the election to investigate people's expectations about their emotional reactions to two hypothetical election outcomes (Obama victory; McCain victory) and followed up a subsample of participants two days after the election to investigate age differences in actual emotional reactions and forecasting accuracy for Barack Obama's victory over John McCain.

Based on the postulated age shifts in emotional experience and preferences, we predicted older adults would forecast their emotional reactivity as more positive (less negative) and more calm (less activated) compared to younger adults. Moreover, to the extent that these forecasts hold a kernel of truth, similar patterns should emerge for both forecasts and actual emotional reactivity. For a positive event (supported candidate wins), we predicted that older adults would forecast and experience larger boosts in low-arousal positive affect (such as contentment) as compared to boosts in high-arousal positive affect (such as excitement) relative to younger adults. Additionally, we predicted that older adults would forecast and experience larger reductions in high-arousal negative affect (such as anger) than younger adults. The prediction is based on the assumption that positive events do not only increase positive emotions, but also reduce negative emotions, particularly those negative emotions that individuals find most aversive. Because older adults find highly arousing negative emotions more aversive than younger adults (Gavazzeni, et al., 2008; Grühn & Scheibe, 2008; Keil & Freund, 2009), we expected that they would forecast greater reductions in high arousal negative emotions.

In turn, for negative events (supported candidate loses), we expected that older adults would forecast and experience relatively smaller increases in high-arousal negative affect (such as anger) and relatively larger increases in low-arousal negative affect (such as sluggishness) than younger adults. While we assumed that age groups experience a similar level of negativity in response to losing, we expected that in younger adults negativity would be expressed relatively more through high-arousal emotions, whereas in older adults it would be expressed relatively more through low-arousal emotions. This assumption is based on prior research showing that overall subjective reactivity for negative events is comparable across age groups (Labouvie-Vief, Lumley, Jain, & Heinze, 2003; Shiota & Levenson, 2009) but that older adults find high-arousal negative emotions more aversive relative to young adults (e.g., Gavazzeni, et al., 2008).

The study also allowed us to go beyond mean-level differences and examine how well individuals' predictions for an Obama victory matched their actual experiences. As suggested above, it remains unclear whether the accuracy of affective forecasting is generally superior with age or whether this advantage may be observed only for positive events. Older adults' heightened attention to emotional well-being, better emotion regulation, and more extensive life experience may grant them a general advantage in affective forecasting. However, given evidence for the positivity effect in information processing (Mather & Carstensen, 2005), an alternative hypothesis is that forecasting accuracy would be superior for positive outcomes but not negative ones. That is, age-related

improvements in affective forecasting accuracy may be limited to those people for whom the election outcome was a positive event (viz., Obama supporters).

Method

Participants and Procedure

A sample of 995 U.S. American voters (50% women; 49% Democrats, 51% Republicans; $M_{\text{age}} = 47$ years, range 20–80 years) was drawn from the nationally representative Knowledge Networks Panel, which recruits panel members by random-digit dialing to participate in research studies in return for free Internet access (27% of the present sample) or small monetary rewards. In our sample, only registered voters were included. Of the sample, 40% were between 20 and 40 years old, 35% were between 40 and 60 years old, and 25% were between 60 and 80 years old. Participants self-identified as 82% White Non-Hispanic, 6% Black Non-Hispanic individuals, 6% Hispanics, and 6% with other or multiple ethnicities. Annual household income ranged from less than \$5,000 to more than \$175,000, with a median of \$40,000–\$59,999. Participants represented all regions of the United States, including Northeast (18%), Midwest (25%), South (36%), and West (22%). Of the sample, 63% were employed, and the remaining 37% were unemployed, retired, or disabled.

Participants were recruited to complete two web-based study sessions “on political issues and the upcoming presidential election” in their homes each lasting about 15 minutes. In Session 1 (3–5 weeks pre-election), participants reported their current affect and made predictions about their affect on the days following the election given two possible election outcomes (Obama victory; McCain victory). They further reported on their interest and expectations regarding the upcoming election and completed measures of life satisfaction and subjective health. The baseline sample was formed by 762 participants who supported either Obama ($n = 354$) or McCain ($n = 408$).

In Session 2 (two days post-election), 471 of the initial participants again reported their current affect. The online nature of the study made it possible to obtain each participant's responses on the same day very shortly after the election, when the emotional impact of the election was still high. Compared to non-completers, completers were more often men, $\chi^2(1) = 7.58, p < .01$, more often White Non-Hispanic individuals (vs. Black Non-Hispanic vs. Hispanic vs. Other Non-Hispanic vs. multiple ethnicities), $\chi^2(4) = 12.00, p < .05$, and somewhat more highly educated (Bachelor's degree vs. some college vs. high school vs. less than high school), $\chi^2(3) = 13.38, p < .01$. Non-completers and completers did not differ in age, income, party affiliation, work status, or regional origin (all $ps > .05$). For the follow-up sample, we selected all participants ($N = 346$) who (a) participated in both sessions, (b) voted either Obama ($n = 161$) or McCain ($n = 185$), and (c) supported the same candidate in both sessions. In addition to regular rewards granted by Knowledge Networks, participants were reimbursed \$5 for completing the first session and \$10 for completing the second session.

Measures

Affect—In each session, participants rated the extent to which, on that day, they were generally feeling each of 15 emotions differing in valence and arousal (happy, content, excited, enthusiastic, activated, calm, relaxed, sad, disappointed, anxious/worried, angry, bored, sluggish, quiet, lonely) on a scale from 1 (*not at all*) to 5 (*extremely*). Using the same affect checklist, participants further predicted in Session 1, in counterbalanced order, how they would feel on the days following the election given Obama's and McCain's victory, respectively. We combined Obama voters' forecasts for an Obama victory with McCain supporters' forecasts for a McCain victory to form win forecast scores. Likewise, we

combined Obama supporters' forecasts for a McCain victory with McCain supporters' forecasts for an Obama victory to form loss forecast scores.

To derive subscales representing the different combinations of valence and arousal (low-arousal positive, high-arousal positive, low-arousal negative, and high-arousal negative), we subjected the 15 items to an exploratory factor analyses with Varimax rotation, requesting four factors. To avoid inconsistencies between the three measurement types (baseline affect, win forecast, loss forecast) we formed factors by selecting only the 3 highest scoring items on each factor. For two factors, one of the three highest scoring items differed between measurement types. We therefore selected the combination that produced the highest reliability (Cronbach's α) across occasions, was theoretically meaningful, and was consistent with prior research (Ross & Mirowsky, 2008; Russell & Barrett, 1999; Tsai, Knutson, & Fung, 2006). Low-Arousal Positive Affect (LAP) was formed by the items *calm*, *relaxed*, *content* ($\alpha_{\text{baseline}}=.81$, $\alpha_{\text{win-forecast}}=.64$, $\alpha_{\text{loss-forecast}}=.66$, $\alpha_{\text{follow-up}}=.87$); High-Arousal Positive Affect (HAP) by *excited*, *enthusiastic*, *activated* ($\alpha_{\text{baseline}}=.80$, $\alpha_{\text{win-forecast}}=.85$, $\alpha_{\text{loss-forecast}}=.54$, $\alpha_{\text{follow-up}}=.86$); Low-Arousal Negative Affect (LAN) by *bored*, *lonely*, *sluggish* ($\alpha_{\text{baseline}}=.69$, $\alpha_{\text{win-forecast}}=.73$, $\alpha_{\text{loss-forecast}}=.69$, $\alpha_{\text{follow-up}}=.70$); and High-Arousal Negative Affect (HAN) by *angry*, *anxious/worried*, *disappointed* ($\alpha_{\text{baseline}}=.80$, $\alpha_{\text{win-forecast}}=.68$, $\alpha_{\text{loss-forecast}}=.79$, $\alpha_{\text{follow-up}}=.85$).

The four factors were low to moderately intercorrelated (for Session 1 affect: $|r|=.21-.55$; for win-forecasts: $|r|=.14-.57$; for loss-forecasts: $|r|=.08-.46$; for Session 2 affect: $|r|=.38-.67$, all $ps < .05$). McCain supporters reported more LAP ($M = 2.92 \pm .81$ vs. $M = 2.73 \pm .89$; $F(1, 749) = 9.86$, $p < .05$) and less HAN ($M = 2.03 \pm .93$ vs. $M = 2.24 \pm .99$, $F(1, 751) = 3.47$, $p < .05$) at baseline than Obama supporters, which is consistent with previous research showing conservatives are happier than liberals (Napier & Jost, 2008). Furthermore, age differences were found for three facets of baseline affect, with HAP ($r = .11$) and HAN ($r = .16$) being higher among older compared to younger adults, and LAN ($r = -.14$, all $ps < .05$) being lower among older compared to younger adults. These age differences were unexpected and might be due to older adults' increased interest in the ongoing election campaign (see below), leading to more intense high-arousal affect independent of valence. To account for candidate and age effects, we controlled for baseline affect in all subsequent analyses.

Additional measures—In Session 1, participants indicated which candidate they were planning to vote for and who they thought would win the election. Among Obama supporters, 68% predicted an Obama win, 5% predicted a McCain win, and 27% were unsure. Among McCain supporters, only 41% predicted a McCain win, while 23% predicted an Obama win, and 36% were unsure. These predictions were unrelated to age and were therefore not considered in further analyses. Participants also reported their interest in the election on a three-item scale (e.g., “How much do you personally care about the outcome of the presidential election?”, scale from 1 (*not at all*) to 5 (*extremely*); Cronbach's $\alpha = .80$, $M = 3.92 \pm .77$). Among McCain supporters (though not among Obama supporters), interest was positively associated with age, $r = .14$, $p = .004$, and was therefore used as control variable. In Session 2, participants reported who they had voted for.

Results

We first report results involving the larger baseline sample and then results involving the smaller follow-up sample. All analyses include age as a continuous variable. The quadratic effect of age was also included although, except as noted, did not have additional predictive value and was removed from the model.

Part I: Analyses Involving the Baseline Sample

Forecasted affect for win scenario—To test the role of arousal in forecasted positive affect, LAP and HAP forecasts for the win scenario were subjected to a general linear model analysis with arousal (low, high) as within-subject factor and age (continuous) and candidate (Obama, McCain) as between-subject factor, controlling for baseline LAP and HAP. The analysis yielded a main effect of arousal, $F(1, 751) = 26.37, p = .001, \eta^2 = .034$, suggesting that everyone expected larger increases in HAP states (excited, enthusiastic, activated) than LAP states (relaxed, content, calm). This indicates that winning the election was generally considered a high-arousal event. There was also a main effect of candidate, in that Obama supporters expected larger increases in both facets of positive affect than McCain supporters, $F(1, 751) = 36.73, p = .001, \eta^2 = .047$. The main effect of age was not significant. Most importantly, a Arousal x Age interaction was found, $F(1, 751) = 14.18, p = .001, \eta^2 = .019$, which was qualified by an Arousal x Age x Candidate interaction, $F(1, 751) = 5.86, p = .016, \eta^2 = .008$. To interpret these effects, we performed follow-up analyses correlating age with the difference score between baseline LAP and forecasted affect LAP, as well as baseline HAP and forecasted HAP, separately for each candidate group. As predicted, older adults forecasted less of an increase in HAP than younger adults, although this was significant only among Obama voters, $r = -.17, p = .001$ ($r = -.06, p > .05$, for McCain voters). The expected age difference for LAP forecasts was not significant, however, $p > .05$.¹ Figure 1A (left side) shows forecasted change in LAP and HAP (forecasted affect minus baseline affect) for the win scenario combined for the two candidate groups.

For forecasted negative affect change in the win scenario, we had predicted that older adults would forecast larger reductions in HAN than younger adults, consistent with the postulated shift away from experiences that are negative and highly activated. We also wanted to explore whether age differences existed for LAN. An Arousal x Age x Candidate general linear model analysis, controlling for baseline LAN and HAN again yielded a main effect of arousal, $F(1, 752) = 53.62, p = .001, \eta^2 = .067$, showing everyone forecasted stronger reductions in high-arousal than low-arousal states. The candidate and age main effects were not significant. Notably, there was an Arousal x Age interaction, $F(1, 752) = 5.17, p = .023, \eta^2 = .007$; higher age was associated with forecasting a larger reduction in HAN, $r = -.15, p = .001$. Additionally, higher age was associated with a smaller reduction in LAN, $r = .17, p = .001$.

Forecasted affect for loss scenario—To test the role of arousal in forecasted negative affect in the loss scenario, LAN and HAN forecasts were compared in an Arousal x Age x Candidate general linear model analysis, controlling for baseline LAN and HAN. As in previous analyses, there was a strong main effect of arousal, $F(1, 752) = 289.67, p = .001, \eta^2 = .278$; participants generally forecasted a larger increase in HAN states than LAN states should their candidate lose. We also found the predicted Arousal x Age interaction, $F(1, 752) = 15.49, p = .001, \eta^2 = .020$. As can be seen in Figure 1A (right side), older adults forecasted relatively larger increases in LAN states, $r = .19$, and relatively smaller increases in HAN states, $r = -.13$, both $ps = .001$, than younger adults. The candidate and age main effects and the Arousal x Age x Candidate interaction were not significant ($p > .05$).

We also explored potential age differences in forecasted positive affect change in the loss scenario. An Arousal x Age x Candidate general linear model analysis, controlling for baseline LAP and HAP, yielded a main effect of Age, $F(1, 751) = 4.46, p = .011, \eta^2 = .009$,

¹When adding interest in the election as a control variable to this and all following analyses, all interaction effects involving age remained robust.

with no Arousal x Age interaction. Older adults forecasted relatively larger reductions in both LAP states, $r = -.08$, $p = .04$, and HAP states, $r = -.15$, $p = .001$, than younger adults, although the age effect for LAP was very small. A main effect of Arousal and an Arousal x Candidate interaction emerged as well, $F(1, 751) = 4.90$, $p = .027$, $\eta^2 = .006$ and $F(1, 751) = 21.26$, $p = .001$, $\eta^2 = .028$. This indicated greater forecasted reductions in HAP compared to LAP among McCain voters, $F(1, 402) = 10.37$, $p = .001$, $\eta^2 = .025$, but not among Obama voters, $p > .05$. Finally, a main effect of candidate signifies that McCain supporters forecasted overall larger affect changes following a loss than Obama supporters, $F(1, 751) = 17.97$, $p = .001$, $\eta^2 = .023$.

To recap, older adults forecasted overall less arousing emotional responses to either election outcome than younger adults. Specifically, they were less likely than younger adults to forecast increases in high-arousal emotions (HAP after victory, HAN after defeat), and more likely to forecast increases in low-arousal emotions (LAN) after defeat than younger adults. An exception was forecasted LAP responses following victory, for which we did not find the predicted age differences. Additionally, older adults forecasted a larger drop in high-arousal negative emotions after victory. Further exploratory analyses indicate that older adults expected a larger drop in both kinds of positive affect (LAP, HAP) following defeat. Using the follow-up sample, we subsequently tested the accuracy of participants' forecasts by comparing forecasts with actual post-election responses.

Part 2: Analyses Involving the Follow-Up Sample

Emotional reactivity after an electoral win (Obama supporters)—Did younger and older Obama supporters experience the levels of low and highly activated positive emotions they anticipated for their candidate's victory? A repeated-measures general linear model with Time (pre-election affect, post-election affect) and Arousal (low, high) as within-subjects factors, Age (continuous) as between-subject factor, and LAP and HAP as dependent variables suggested so. Obama supporters experienced a substantial increase in both facets of positive affect, as indicated by a strong Time effect, $F(1, 156) = 122.92$, $p = .001$, $\eta^2 = .441$. Consistent with forecasts, the effect was more pronounced for high-arousal states than low-arousal states (Time x Arousal), $F(1, 156) = 14.91$, $p = .001$, $\eta^2 = .087$. This confirms that the electoral win was generally a high-arousal event for supporters of the winning candidate. Despite this, there were nuances in emotional responding as a function of age. Specifically, we found the expected Time x Arousal x Age effect, $F(1, 156) = 21.61$, $p = .001$, $\eta^2 = .122$. Figure 1B (left side) illustrates this effect in terms of the experienced change in affect (follow-up session affect minus baseline affect). As shown in the figure, older adults responded with a stronger increase in LAP than younger adults, $r = .26$, $p = .001$. The age difference in HAP increase was not significant, $r = -.12$, $p > .05$. Overall, the pattern of age differences was consistent with, and even exceeded, forecasted changes in positive affect. Indeed, there was now a cross-over effect such that in the youngest participants the LAP response was smaller than the HAP response, whereas the reverse pattern was evident in the oldest participants.

In addition to boosts in positive affect, victory led to reduced levels of negative affect. Repeating the above analysis with LAN and HAN scores as dependent variables yielded a strong Time effect, $F(1, 155) = 84.21$, $p = .001$, $\eta^2 = .352$. A Time x Arousal interaction was also found, $F(1, 155) = 66.54$, $p = .001$, $\eta^2 = .300$, indicating a larger drop in HAN than LAN. Importantly, a Time x Arousal x Age effect was found, $F(1, 155) = 6.58$, $p = .011$, $\eta^2 = .041$. Older adults responded with a larger reduction of HAN levels than younger adults, $r = -.24$, $p = .001$, but did not differ from the young in reduction of LAN levels, $p > .05$. This suggests that encountering a positive event allowed older adults to reduce those emotions that they find most aversive, viz. negative, high-arousal states.

Emotional reactivity after electoral defeat (McCain supporters)—The prototypical reaction to one's candidate defeat is elevated levels of negative affect. And indeed, a general linear model analysis with Time and Arousal as within-subjects factors, Age as between-subjects factor, and LAN and HAN as dependent variables revealed a strong main effect of Time, $F(1, 182) = 69.93, p = .001, \eta^2 = .278$, indicating significant increases in negative affect in McCain supporters. Affect changes again were more pronounced for high-arousal than low-arousal states, $F(1, 182) = 21.51, p = .001, \eta^2 = .106$. These effects were qualified by a Time x Arousal x Age interaction, $F(1, 182) = 11.01, p = .001, \eta^2 = .057$, as shown in Figure 1B (right side). Paralleling emotional reactivity to the victory, older adults reacted less than younger adults with an increase in high-arousal emotions, $r = -.19, p = .011$. The age effect in low-arousal negative affective reactivity was not significant, $r = .12, p = .096$. No age main effect or Time x Age interactions were found.

The electoral defeat also led to reductions in positive affect, as forecasts had predicted. A Time x Arousal x Age general linear model analysis predicting LAP and HAP scores among McCain supporters yielded a strong Time effect, $F(1, 182) = 55.21, p = .001, \eta^2 = .233$, with no Time x Arousal interaction: LAP and HAP emotions were equally diminished. The Time x Age x Arousal effect was not significant, $p > .05$. In contrast to forecasts, older adults did not experience a larger drop than younger adults in either LAP or HAP, both $p > .05$.

Forecasting Accuracy—We next tested how well participants had forecasted their emotional experience. We distinguished between direction and size of forecasting errors. First, based on the simple difference between Obama forecasts and Session 2 affect, we created two dummy variables to code the direction of errors. The first variable coded for overestimation error (forecast > actual) and the second variable coded for underestimation error (forecast < affect). We conducted a logistic regression (separately for each candidate group) in which we predicted each error type by the linear and quadratic effects of age, as well as the corresponding baseline affect. Below we consider results for typical forecasting errors (overestimating positive affect and underestimating negative affect after positive event, and underestimating positive affect and overestimating negative affect after negative event). For illustration, Table 1 lists the likelihood of making prototypical forecasting errors after splitting the sample into three age groups, along with results from the logistic regression analyses. In line with the prediction that forecasting accuracy improves with age, among Obama supporters, older adults were less likely to overestimate LAP (though not HAP) and to underestimate both LAN and HAN. In one instance (the likelihood of overestimating LAP), there was also a quadratic age effect, signifying that younger adults were more prone to this type of error than both middle-aged and older adults. Among McCain supporters, only one age effect emerged and was in the opposite direction. Older McCain supporters were more likely to overestimate LAN, thus feeling less negative after the defeat than they had predicted.

Second, to examine the size of forecasting errors, we calculated the absolute difference between Obama forecasts and Session 2 affect. Because we did not have differential hypotheses for single affect subscales, and because small errors on individual affect subscales can add up to form large effects, we created a sum score across the four scales. We analyzed this index in a general linear model analysis with Age (continuous) and Candidate as between-subjects factors, while controlling for baseline affect. A main effect of candidate emerged, $F(1, 333) = 36.45, p = .001, \eta^2 = .099$, suggesting that forecasting errors were generally larger among McCain supporters than Obama supporters. More importantly, we found an Age x Candidate interaction, $F(1, 333) = 8.17, p = .005, \eta^2 = .024$, which is illustrated in Figure 2. The size of forecasting errors was systematically reduced with age among Obama supporters, $r = -.20, p = .014$, but not among McCain supporters, $r = .12, p = .096$.

12. This finding supports the idea that age-related improvements in forecasting accuracy are limited to the prediction of positive events.

To recap, several indices suggest that age is associated with improved forecasting accuracy among voters whose candidate won (i.e., Obama supporters), specifically the reduced likelihood of three out of four prototypical forecasting errors (overestimating LAP, underestimating LAN, and underestimating HAN) and the overall size of forecasting errors. In contrast, none of the forecasting indices suggested improved forecasting accuracy with age among voters whose candidate lost (i.e., McCain supporters). Indeed, one index (the likelihood of overestimating LAN) suggested decreased forecasting accuracy with age in the loss scenario.

Discussion

Affective forecasts illustrate how cognition and emotion can be deeply intertwined: Affective forecasts are inferences about the probability of future affective experiences in which people use knowledge or subjective theories to infer how events will impact future emotional responses. Our study was designed to examine affective forecasting in adults spanning a wide age range as they anticipated and experienced a widely shared and meaningful event, namely, the 2008 U.S. presidential election. We assessed both valence and arousal of forecasted and experienced emotional reactions, as well as the accuracy of such forecasts, with the goal of uncovering potential age differences in the inferential and experiential processes surrounding an emotional event.

By and large, results are consistent with the contention that affective forecasts, and to a lesser extent actual emotional reactions, reflect general age-related shifts toward favoring states that are positive and relatively low in arousal and away from states that are negative and highly arousing. In response to the electoral victory, older adults experienced (but did not forecast) a relatively larger increase in low arousal positive emotions (e.g., contentment) than younger adults, forecasted (but did not experience) a relatively smaller increase in high-arousal positive emotions (e.g., excitement), and forecasted *and* experienced a relatively larger reduction in negative high-arousal emotions (e.g., anger). In response to the electoral defeat, older adults forecasted *and* experienced less of an increase in negative high-arousal emotions (e.g., anger). Older adults also forecasted more of an increase in negative low-arousal emotions (e.g., sluggishness) and a larger drop in both low- and high-arousal positive affect (e.g., contentment, excitement) in response to an electoral defeat, yet their actual emotional reactions did not reflect these expectations.

Findings further indicate that affective forecasts match actual experiences more closely in older adults experiencing a positive event, such as Obama's victory among Obama supporters. In this case, older adults were less likely than younger adults to make the typical errors of overestimating positive affect (though not HAP) and underestimating negative affect. Moreover, the magnitude of errors was reduced with age. However, when experiencing a negative event, such as McCain's defeat among McCain supporters, older adults were no more accurate than young adults in predicting their emotional reactions – with one indicator (the likelihood of overestimating LAN) even indicating poorer performance. Thus, younger and older McCain supporters were nearly equally likely to overestimate negative affect and underestimate positive affect following McCain's succession to Obama. We discuss the findings and their implications below.

Affective Forecasts Reflect Shifts in Emotional Preferences and Experience With Age

Across adulthood, emotional experience becomes generally more positive (Carstensen, et al., 2010). Recent evidence suggests that emotional experience also becomes less activated

with age (e.g., Ross & Mirowsky, 2008), at least in the absence of unavoidable, highly stressful circumstances (Charles & Piazza, 2009). Consistent with this change in emotional experience, older adults appear to value positive low-arousal stimuli more than younger adults, and find negative high-arousal stimuli more aversive (e.g., Gavazzeni, et al., 2008). Our findings on age-related shifts in forecasted and experienced emotions underscore the importance of both valence and arousal components of emotional experience when characterizing emotional aging. Specifically, such findings indicate that the valence dimension, though essential, may not fully capture the changing nature of emotional experience with age. For example, older Obama supporters experienced (albeit did not forecast) a relatively larger increase in positive low-arousal emotions (e.g., contentment) after victory than younger Obama supporters, and they forecasted *and* experienced a relatively larger reduction in negative high-arousal emotions (e.g., anger). Thus, not only valence but also arousal differed between young and older adults' forecasted and experienced affect.

Notably, age differences in *forecasted* affect were more apparent than age differences in *experienced* affect. Specifically, age differences were found for all but one of the four affect subscales in win forecasts (the exception being LAP), and in all four affect subscales in loss forecasts. In contrast, age differences were observed on only two of four affect subscales (LAP and HAN) in *actual* affect change after winning, and in only one of four affect subscales (HAN) in actual affect change after losing. This pattern resonates with theories on cultural influences on affect, such as Affect Valuation Theory (AVT; Tsai, et al., 2006; Tsai et al., 2009). AVT maintains that culture, including cultural views of old age, shapes affective preferences (or ideal affect) more than it shapes actual affect. Although affective preferences (how people want to feel) are distinct from affective forecasts (how people expect to feel), they are related in their reliance on semantic emotion knowledge as opposed to experiential knowledge (Robinson & Clore, 2002). Moreover, a long history of studies on motivated reasoning demonstrates that people's preferences shape their inferences, that is, people tend to believe what they want to believe (Kruglanski, 1996). Our findings are consistent with this tendency. Older adults' penchant for positive low-arousal states and dislike of negative high-arousal states (Gavazzeni, et al., 2008; Grühn & Scheibe, 2008; Keil & Freund, 2009) appears to color their affective forecasts more than their actual affective reactions to the electoral victory or defeat.

Even though actual affective responses to the election were overall less strongly related to age than forecasted affective responses, one important affect dimension was consistently different across age groups in both forecasted and experienced affect. Namely, losing the election was associated with a lesser increase in HAN and winning the election was associated with a larger reduction in HAN in older adults as contrasted with younger adults. This age difference is important given that chronic experiences of anger, anxiety, and other negative high-arousal emotions are risk factors for poor health (Smith, 2006). Results dovetail with previous research showing that older adults experience less anger in interpersonal situations (Blanchard-Fields & Coats, 2008; Charles & Carstensen, 2008) and suggest that older adults do not only experience less of these states in response to emotional events, but also anticipate less of these states *before* emotional events actually occur.

One outstanding issue concerns the causes of age-related shifts in arousal preferences and experiences identified in our study. Hypotheses tested in the present study were derived from Socioemotional Selectivity Theory. However, the study design did not permit causal tests about motivation or other possible causal factors. Some research suggests, for example, that aging is also associated with physiological changes associated with reduced physiological flexibility (Deschenes, Carter, Matney, Potter, & Wilson, 2006). As a result, high-arousal situations may be more difficult to regulate with age, experienced as more

aversive, and subsequently more carefully avoided (Charles & Piazza, 2009). Still another possibility is that age-associated preferences for relatively calm states facilitate adjustment (Tsai, 2007). Additional research that examines underlying motivational and physiological mechanisms involved in affective forecasting is indicated.

Improved Forecasting Accuracy With Age for Positive Events Only

Contrary to the idea that there is a general improvement in affective forecasting accuracy with age, older adults in our study were better at forecasting their emotional experience after a positive but not a negative event relative to younger adults. This finding speaks against purely contextual explanations of the age differences found, for example, that the lives of older people are generally more predictable and it is therefore easier to forecast future affective states. If this were the case, the same age differences should appear irrespective of whether the event is positive or negative. Instead, the absence of age-related forecasting benefits for negative events is consistent with the positivity effect in information processing, suggesting that older adults strategically avoid negative material and show lower neural anticipation of losses (Mather & Carstensen, 2005; Samanez-Larkin, et al., 2007). Extending the literature on the positivity effect in attention, memory, and neural processing, the present set of findings suggests that a positivity effect may also occur in judgments about future affect, such that older adults are more accurate than younger adults about forecasting emotional responses to positive events, but they are no more accurate than younger adults about forecasting emotional responses to negative events.

One remaining issue is whether improved forecasting accuracy with age for positive events is adaptive. It has been suggested that exaggerated forecasts are advantageous in the sense that they motivate individuals to work harder towards achieving (or avoiding) states that are predicted to produce strong emotional reactions even if these do not measure up to the expectations later on (Wilson & Gilbert, 2005). From this perspective, one important source of approach motivation, inflation of future positive experience, could be reduced in older adults. In turn, accurate forecasting also helps individuals choose between competing options, and being adept at forecasting affective reactions to competing options can lead to better decisions (Mellers & McGraw, 2001; Wilson & Gilbert, 2005). From this perspective, improved forecasting accuracy may help older adults discriminate between available options and select those options that most closely match their emotional goals.

The latter, positive view on accurate forecasting as being adaptive is supported by evidence that affective forecasting accuracy is linked with emotional competence (Dunn, Brackett, Ashton-James, Schneiderman, & Salovey, 2007). In line with this finding, posthoc analyses with the present data suggest that among supporters of the winning candidate, higher forecasting accuracy (i.e., lower absolute size of forecasting error summed across affect subscales) was related to increased life satisfaction ($\beta = .21$, $t(148) = 2.92$, $p = .004$) and subjective health ($\beta = .17$, $t(150) = 2.12$, $p = .035$), after controlling for baseline affect and age. However, no such relationship was found for supporters of the losing candidate. Future research should assess the contexts in which accurate affective forecasting is beneficial or maladaptive.

Strengths and Limitations

One strength of the present study lies in the emotional meaningfulness of the target event: The election engaged and affected people of all ages, as demonstrated by participants' strong emotional reactions to the election outcome. In turn, one disadvantage of such an approach is the lack of experimental control: The valence of the target event was necessarily confounded with political orientation and preferences, leaving it open whether the same age differences would have been found for the counterfactual case, McCain's victory over

Obama. Another limitation of the present study is that the pre-election data were collected in a fairly large (2-week) time window, in which polling data and the public presidential debates might have influenced people's expectations and opinions surrounding the election. However, the timing of the first study session influenced neither baseline nor forecasted affect, rendering it unlikely that results were affected by the distance of the first study session to the election. Finally, the current study focused on an event that is fairly rare. Even the older adults in the study had experienced presidential elections only a few times across their adult years, and this may have limited the potential effects of practice on forecasting accuracy. Additional studies making use of more common emotionally meaningful events are needed to further test the idea that age is associated with systematic change in forecasted and experienced affect. Future research based on experience-sampling methods that sample people's emotional experience in ecological settings could prove useful in this regard and contribute significantly to understanding the relation between affective forecasting and everyday emotional competence more broadly.

Conclusion

Our study addressed age differences in inferences about one's affective future in the context of an emotionally relevant event. Overall, the results show that young and older adults differed in their inferences about their emotional reactions to the 2008 U.S. Presidential election, with older adults forecasting overall less arousing responses to either election outcome. In addition, forecasting accuracy was enhanced with age among supporters of the winning candidate but not among supporters of the losing candidate. These results add to emerging research that suggests important age differences in affective preferences and experience and show that these may color people's visions of their future.

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Figure 1.

Age differences in (A) forecasted affect change (Forecasted minus pre-election affect) and (B) actual affect change (post-election minus pre-election affect) when supported candidate wins or loses the election. LAP = Low-arousal positive affect. HAP = High-arousal positive affect. LAN = Low-arousal negative affect. HAN = High-arousal negative affect. * $p < .05$ for simple slope effects (correlation between age and difference score).

Figure 2.

Age differences in absolute forecasting error (summed across affect subscales), separately for supporters of the winning and losing candidate. * $p < .05$ for simple slope effects.

Table 1

Likelihood of making prototypical forecasting errors, and coefficients from logistic regression analyses

	Young adults 20–40 years (<i>n</i> = 142)	Middle-aged adults 40–60 years (<i>n</i> = 116)	Old adults 60–80 years (<i>n</i> = 88)	Age <i>B</i> (SE)	Age ² <i>B</i> (SE)
Prototypical Forecasting Errors Obama Supporters					
Overestimate LAP	.39	.19	.19	-.033 (.011)*	.002 (.001)*
Overestimate HAP	.51	.55	.57	.004 (.011)	.001 (.001)
Underestimate LAN	.50	.44	.29	-.024 (.011)*	.000 (.001)
Underestimate HAN	.36	.19	.17	-.029 (.012)*	.000 (.001)
Prototypical Forecasting Errors McCain Supporters					
Underestimate LAP	.74	.68	.75	.000 (.011)	.001 (.001)
Underestimate HAP	.53	.56	.59	.004 (.010)	.001 (.001)
Overestimate LAN	.26	.40	.51	.031 (.013)*	.000 (.001)
Overestimate HAN	.74	.75	.67	-.010 (.011)	.000 (.001)

Note. All logistic regression analyses controlled for baseline affect.

* $p < .05$.