Decision Strategies in Healthcare Choices for Self and Others: Older Adults Make Adjustments for the Age of the Decision Target, Younger Adults Do Not

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Abstract

Participants (n = 142 younger and older adults) made healthcare choices for themselves, a social partner of similar age, or a social partner substantially younger or older than themselves. Using computer-based decision scenarios, participants reviewed positive, negative, or neutral choice criteria before choosing. Older adults who chose for themselves reviewed a greater proportion of positive choice criteria, recalled their choices more positively, and showed more positive emotional responses than younger adults. Comparable results were found when participants chose for another person of similar age. Older adults who were asked to choose for a young person, however, showed a reduced focus on positive information and their emotional experience during the review process was less positive. Younger adults' performance was not influenced by the decision target.

Keywords

age differences; socioemotional selectivity theory; positivity effect; healthcare choices; surrogate decisions

Introduction

Socioemotional selectivity theory (SST, Carstensen, 2006) holds that age-related constraints on future time shift motivational priorities from future-oriented information-gathering goals towards present-oriented emotion-regulatory goals. According to SST, age-related goal shifts influence cognitive processing and lead to a "positivity effect" – a disproportionate emphasis on positive information in older adults' attention and memory. This phenomenon has been demonstrated across a wide range of tasks and replicated across multiple laboratories (for a review see Mather & Carstensen, 2005).

Because choices involving difficult trade-offs often create a conflict between wellbeing and information acquisition (Luce, 1998) it is not surprising that the positivity effect is observed in decision contexts. Löckenhoff and Carstensen (2007) tracked the review of features associated with healthcare options and found that older adults reviewed and recalled a greater proportion of positively valenced choice criteria than younger adults (compare Mather, Knight, & McCaffrey, 2005; Mather & Johnson, 2000). The present study extends these findings by examining whether effects generalize to scenarios in which participants make choices for other

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people and by investigating whether a focus on positive material benefits emotional wellbeing during decision-making.

SST maintains that although advanced age is associated with chronically activated goals to support wellbeing, contextual influences on motivational states may temporarily override this tendency. In support of this postulate, instructional manipulations that emphasized information-processing goals were found to eliminate the age-related positivity effect in autobiographical memory (Kennedy, Mather, & Carstensen, 2004) and decision-making strategies (Löckenhoff & Carstensen, 2007). Reasoning similarly, we expected that consciously adopting the perspective of another person would activate the goal states perceived in that person and lead to adjustments in processing strategies. Specifically, we hypothesized that when asked to decide for another older person, older people would show a similar positivity effect in review and recall as when choosing for themselves. Yet, when making a decision for a younger person, information-processing goals would be activated and positivity would be reduced. We did not expect younger adults to modify their decision processes because they do not have access to the motivational experience of older adults whereas older adults, by virtue of having been young, would have such knowledge. Finally, we expected that older adults' tendency to focus on positive material would benefit emotional wellbeing.

Method

Participants

Participants were recruited from undergraduate classes and the surrounding community. Older (n=71, aged 65-92, *M*=78.10, *SD*=6.94) and younger participants (n=71, aged 18-29, *M*=19.86, *SD*=1.93) did not differ by gender (63% female) or ethnicity (79% Caucasian), but older adults had more years of education (M_{old}=15.79, *SD*=2.35 vs. M_{young}=12.66, *SD*=1.62, *t*(140) = 0.01, *p* < .001).[1]

Procedure

We employed an age group by decision target (self, social partner of similar age, social partner of different age) between-subject design. In the 'self' condition, participants made choices for themselves. In the other two conditions, they were asked to think of a close social partner and choose for him/her. In the 'similar age' condition, participants selected someone matching their own age group. In the 'different age' condition, younger/older participants selected a social partner aged 60 or above/aged 18-30, respectively. All participants respected the specified age ranges and their relationship to the targets (76% relatives, 21% friends) did not differ across age groups, $\chi^2(N=94)$=1.26, *n.s.*

Two choice scenarios involving physicians and health plans were administered in counterbalanced order on an Apple laptop using the Hypercard program. Each decision grid described four choice alternatives (e.g., "Doctor A") on five characteristics (e.g., "education"). Each alternative was rated *average* on global patient/consumer satisfaction and *very good, good, poor*, or *very poor* on the remaining characteristics. There was no obvious "best" choice.[2]

Participants reviewed the decision grids one cell at a time by selecting individual cells with the mouse. Cells could be viewed repeatedly and there were no time limits. Shading provided visual cues for the cells' emotional valence:

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[1]We initially recruited 71 older and 119 younger adults. To account for discrepancies in gender and ethnicity, we selected a younger sample matching the older sample in those characteristics. Findings are comparable when using the full sample or limiting analyses to Caucasians.
[2]For a detailed description of the task see Löckenhoff and Carstensen (2007).

- white = positive information (*good/very good*)

- gray = neutral information (*average*)

- dark = negative information (*poor/very poor*)

Thus, participants could selectively seek out positive or avoid negative information, but the alternatives could not be differentiated based on the cues alone.

A practice scenario concerning vacations familiarized participants with the task. Before the practice scenario and after each of the healthcare choices, participants indicated on a 7-point Likert scale (from 1 = not at all to 7 = extremely) how much they experienced 8 positive and 11 negative emotions (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000).

Recall was assessed using printouts of each scenario showing only the row and column headers but none of the cues or ratings. Participants circled the alternative they thought they had chosen and filled in the individual cells of this alternative with the appropriate ratings. As a reminder, possible ratings were shown on a scale ranging from *very poor* to *very good*. Participants could assign the same rating multiple times.[2]

Data reduction

We computed mean scores for self-reported positive and negative emotions at each time of assessment. For each scenario, we computed the proportion of cells in the grid that had been reviewed at least once and the frequency of repeat reviews for these cells. To examine *positivity during review*, we computed the difference between the proportion of negative versus positive cells that had been opened at least once.[3] Scores on this index range from -1 to 1. To capture *positivity during recall*, we assigned numerical scores to the recalled value ratings (e.g., *very poor*=-2, *average*=0, *good*=1) and computed the means for each scenario resulting in scores ranging from -2 to 2. On both indices, positive scores indicate a positivity effect and negative scores indicate a disproportionate focus on negative material. Review and recall indices were moderately correlated (physician scenario: r=.30, p<.01, plan scenario: r=.45, p<.01).

Results

Review

Table 1 (top) shows the proportion of cells reviewed, the frequency of review, and the positivity index for review by scenario, age group, and condition. For each scenario, we conducted separate age group by condition between-subject ANOVAs. The proportion of cells reviewed and the frequency of review showed no significant main effects or interactions (p-values>.15). For positivity during review, both scenarios showed main effects of age, $F(1, 134)>5.89$, $p<.05$, $\eta^2_p>.04$. There were no main effects of condition, but the physician scenario showed a significant age by condition interaction, $F(1, 134)=3.29$, $p<.05$, $\eta^2_p=.05$. As predicted, an examination of the confidence intervals (Table 1) revealed that older adults showed a significant positivity effect in the 'self' and 'similar age' condition but not in the 'different age' condition, whereas younger adults did not show a positivity effect in any of the conditions. For the plan scenario, there was no age by condition interaction. Results did not change when including the total proportion of reviewed cells or review frequency as covariates.

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[3]Neutral cells were not analyzed because the information was redundant (i.e., all gray cells contained the label "average"). Since this became obvious during the practice scenario, there was no further incentive to open neutral cells.

Recall

In the health plan scenario, older adults were less likely to recall which option they had chosen (52%) than younger adults (74%, χ^2(N= 36)=7.26, $p<.01$). In the physician scenario, accuracy did not differ significantly by age (old: 61%, young: 71%).

Table 1 (bottom) shows positivity during recall by scenario, age group, and condition. For each scenario, we conducted separate age by condition between-subject ANOVAs. Both scenarios showed main effects of age, $F(1, 132)>20.10$, $p<.0001$, $\eta^2_p=.10$. There were no main effects of condition, but the physician scenario showed a significant age by condition interaction, $F(1, 134)=4.17$, $p<.05$, $\eta^2_p=.06$. As predicted, an examination of the confidence intervals revealed that older adults showed a significant positivity effect in the 'self' and 'similar age' condition but not in the 'different age' condition, whereas younger adults did not show a positivity effect in any condition. For the plan scenario, there was no age by condition interaction. Results did not change when including recall accuracy, review frequency, or proportion of reviewed cells as covariates.

Emotional responses

Table 2 shows positive and negative emotions (collapsed across scenarios) by age group, condition, and time point. To examine age and condition effects on participants' emotional responses, we computed ANOVAs (with Greenhouse-Geisser corrections, and Bonferroni-corrected post-hoc tests) entering age group and condition as between-subject factors, time as a repeated-measures factor, and positive/negative emotions as dependent variables.

For *positive emotions*, we found main effects of time, $F(1.35, 180.62)=59.67$, $p<.001$, *partial* $\eta^2=.31$, age, $F(1, 134) = 10.83$, $p<.001$, $\eta^2_p=.08$, and condition, $F(2, 134)=6.35$, $p<.01$, $\eta^2_p=.09$. There were no two-way interactions but the main effects were qualified by a significant three-way interaction, $F(2.70, 180.62)=5.17$, $p<.01$, $\eta^2_p=.07$. Separate condition by time ANOVAs within age groups found that for younger adults, there was a main effect of time, $F(1.47, 98.76)=70.16$, $p<.001$, $\eta^2_p=.51$, suggesting declines in positive emotions over time, but no other significant effects. For older adults, there was a main effect of time, $F(1.30, 86.79)=19.63$, $p<.001$, $\eta^2_p=.23$, a main effect of condition, $F(2, 67)=4.92$, $p<.01$, $\eta^2_p=.13$, and a time by condition interaction, $F(2.59, 86.79)=3.44$, $p<.05$, $\eta^2_p=.09$, suggesting that their positive emotions declined in the 'different age' condition but remained stable in the other two conditions. In further support of the postulate that positivity benefits emotional wellbeing, residualized change in positive emotions (capturing variations in post-decision emotions after accounting for emotions at baseline) was positively correlated with positivity during recall (r=.20, p<.05) although this effect did not reach significance for positivity during review (r=.11, n.s.).

For *negative emotions*, there was a main effect of age, $F(1, 134)=11.38$, $p<.001$, $\eta^2_p=.08$, suggesting that older adults felt less negative, and a main effect of condition, $F(2, 134)=3.23$, $p<.05$, $\eta^2_p=.05$, which was qualified by a time by condition interaction, $F(3.48, 233.34)=3.20$, $p<.05$, $\eta^2_p=.05$. Repeated-measures ANOVAs examining time effects in each condition suggested that negative emotions showed a marginally significant increase over time in the 'different age' condition, $F(1.98, 101.17)=3.01$, $p=.05$, $\eta^2_p=.06$, but not in the other conditions. The remaining interactions and the correlations between residualized change in negative emotions and positivity during review (r=-.11) and recall (r=-.09) were not significant (p-values>.2).[4]

Discussion

Our primary goal was to examine whether the positivity effect that had been observed in older adults' healthcare choices (Löckenhoff & Carstensen, 2007) would extend to choices made for others. As predicted, choices for a person of similar age were comparable to the choices individuals made for themselves. Thus, merely taking the perspective of another person did not sway older adults' tendency to focus on positive material. However, the positivity effect was reduced when older adults chose for a younger social partner, suggesting some implicit knowledge that motivational states are different for younger adults. As expected, this came at an emotional cost. In the 'different age' condition, older adults showed a decline in positive emotions, whereas their emotions remained stable when choosing for themselves or a similarly-aged target. Younger adults, in contrast, reviewed equal portions of positive and negative material and experienced a decline in positive emotions regardless of who they were choosing for – presumably because they had no personal experience with age-related motivational changes.

Our findings are theoretically relevant because they elucidate the mechanisms that underlie age differences in emotional processing and practically relevant because they reveal biases that may influence surrogate decisions in medical contexts (e.g., Ditto et al., 2001). Nevertheless, several open questions remain. The predicted influence of age and condition on emotional experience was found for positive but not for negative emotions, which likely was due to a floor effect in negative emotions. Second, the fact that all of the younger adults were students limits generalizability. However, findings from the control condition in the present study replicate results from a previous study that used a non-student sample of younger adults (Löckenhoff & Carstensen, 2007). This earlier study also controlled for a variety of cognitive variables, self-efficacy, and prior experience and none accounted for age differences in positivity

Another important caveat is that although a main effect of age on positivity was observed in both scenarios, the predicted age by condition interaction was observed only in the physician scenario. It is possible that participants' perspective-taking efforts were more successful when choosing among persons than among more abstract concepts such as health plans. However, additional research is needed to confirm the reliability of these results and to specify the conditions when the positivity effect is most likely to appear. Finally, our findings are limited by the specific format of the present choices (i.e., shaded decision grids presenting comparison ratings). Future research needs to examine whether findings generalize beyond hypothetical choices to real life decisions and whether positivity influences decision accuracy and quality.

Acknowledgments

References

Carstensen LL. The influence of a sense of time on human development. Science 2006;312:1913–1915. [PubMed: 16809530]

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[4]Supplemental analyses that separately examined emotional responses to the physician versus the health plan scenario yielded results that were comparable to the pattern of effects for averaged emotion scores. Given that review and recall strategies showed differences across scenarios, this finding was somewhat surprising. However, because of the counterbalanced decision order, the emotional responses to a given scenario may have been influenced by the scenario that was presented right beforehand. This could account for the similarity in results.

Carstensen LL, Pasupathi M, Mayr U, Nesselroade JR. Emotional experience in everyday life across the adult life span. Journal of Personality and Social Psychology 2000;79:644–655. [PubMed: 11045744]

Ditto PH, Danks JH, Smucker WD, Bookwala J, Coppola KM, Dresser R, et al. Advance directives as acts of communication: A randomized controlled trial. Archives of Internal Medicine 2001;161:421–430. [PubMed: 11176768]

Kennedy Q, Mather M, Carstensen LL. The role of motivation in the age-related positive bias in autobiographical memory. Psychological Science 2004;15:208–214. [PubMed: 15016294]

Löckenhoff CE, Carstensen LL. Aging, emotion, and health-related decision strategies: Motivational manipulations can reduce age differences. Psychology and Aging 2007;22:134–146. [PubMed: 17385990]

Luce MF. Choosing to avoid: Coping with negatively emotion-laden consumer decisions. Journal of Consumer Research 1998;24:409–433.

Mather M, Carstensen LL. Aging and motivated cognition: The positivity effect in attention and memory. Trends in Cognitive Sciences 2005;9:496–502. [PubMed: 16154382]

Mather M, Johnson MK. Choice-supportive source monitoring: Do our decisions seem better to us as we age? Psychology & Aging 2000;15:596–606. [PubMed: 11144319]

Mather M, Knight M, McCaffrey M. The allure of the alignable: Younger and older adults' false memories of choice features. Journal of Experimental Psychology: General 2005;134:38–51. [PubMed: 15702962]

Table 1

Mean review and recall scores by scenario, age group, and instructional condition

Decision Target	Physician Scenario			Health Plan Scenario		
	Self	Other (Similar age)	Other (Different age)	Self	Other (Similar age)	Other (Different age)
Proportion of Cells Reviewed						
Young	.85 (.76, .94)	.77 (.67, .87)	.78 (.69, .87)	.84 (.75, .94)	.85 (.75, .95)	.78 (.69, .87)
Old	.74 (.65, .83)	.84 (.74, .95)	.79 (.70, .88)	.87 (.77, .96)	.76 (.66, .87)	.87 (.78, .96)
Frequency of Review						
Young	2.33 (1.52, 3.14)	2.45 (1.56, 3.33)	2.73 (1.97, 3.50)	2.26 (1.61, 2.89)	1.98 (1.28, 2.68)	2.15 (1.55, 2.75)
Old	3.06 (2.25, 3.87)	3.45 (2.54, 4.36)	2.49 (1.71, 3.27)	2.21(1.57=, 2.85)	2.42 (1.70, 3.13)	2.65 (2.03, 3.26)
Positivity Index for Review						
Young	-.06 (-.18, .07)	-.10 (-.24, .04)	.04 (-.08, .16)	.02 (-.09, .14)	-.02 (-.15, .10)	.01 (-.10, .12)
Old	**.22 (.09, .34)**	**.27 (.13, .41)**	.09 (-.03, .21)	**.11 (.001, .23)**	**.14 (.01, .27)**	**.11 (.001, .23)**
Positivity Index for Recall						
Young	.07 (-.10, .23)	.05 (-.13, .24)	.11 (-.05, .27)	.03 (-.12, .17)	-.03 (-.19, .13)	.04 (-.10, .17)
Old	**.54 (.36, .72)**	**.50 (.32, .68)**	.15 (-.01, .31)	**.46 (.31, .61)**	**.49 (.33, .65)**	**.37 (.23, .51)**

Note: 95% confidence intervals are shown in parentheses. For positivity indices in review and recall, bold font indicates values whose confidence interval does not include zero.

Table 2

Mean self-rated positive and negative emotions by time of assessment, age group, and instructional condition

	Positive Emotions			Negative Emotions		
	Baseline	1st Choice	2nd Choice	Baseline	1st Choice	2nd Choice
Choice for Self						
Young	3.93 (0.91)	3.39 (0.85)	3.03 (0.88)	1.99 (0.64)	1.85 (0.62)	1.84 (0.69)
Old	4.24 (1.10)	3.89 (1.35)	3.95 (1.32)	1.50 (0.53)	1.40 (0.53)	1.50 (0.76)
Choice for Other - Similar age						
Young	3.42 (0.91)	2.84 (0.80)	2.72 (0.92)	2.12 (0.79)	2.18 (0.82)	2.04 (0.75)
Old	4.31 (1.20)	3.84 (1.63)	3.81 (1.57)	1.65 (0.78)	1.69 (0.80)	1.55 (0.79)
Choice for Other - Different age						
Young	3.18 (1.03)	2.86 (1.18)	2.65 (1.14)	1.64 (0.75)	1.63 (0.69)	1.61 (0.75)
Old	3.85 (1.18)	2.85 (1.23)	2.60 (1.18)	1.23 (0.36)	1.49 (0.71)	1.57 (0.72)

Notes: Standard deviations are shown in parentheses. Emotion scores are collapsed across decision scenarios.