Understanding Decisions About Sunk Costs From Older and Younger Adults’ Perspectives

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Objectives. Prior research indicates that older adults (60+ years) are less subject to the sunk-cost fallacy compared with younger adult college students. The objective of this research was to determine if age-related differences in decisions about sunk costs reflected differences in what was salient to individuals about the situation when they described their decision-making goals.

Methods. Using hypothetical decision-making scenarios, we examined older (N = 21) and younger (N = 20) adults’ decisions about sunk costs. Participants responded to open-ended interview questions about their decision-making goals. A coding scheme was developed using qualitative methods and was used to reliably categorize the issues and concerns people expressed when describing their decision-making goals.

Results. Compared with younger adults, older adults were less likely to commit the sunk-cost fallacy and were more likely to make normatively correct decisions. When describing their goals, older adults were less likely to focus on the presence or absence of the prior investment (the sunk cost). The salience of investment-related information to individuals when describing their goals mediated age-related differences in the sunk-cost fallacy and normatively correct decisions.

Discussion. The results illustrate how consideration of people’s own perspectives of decision-making situations may inform understanding of age-related differences in decision-making fallacies.

Key Words: Aging—Decision making—Goals—Individual differences—Sunk costs.

The sunk-cost fallacy is an irrational decision to invest more future resources in a situation after an investment has been made (costs are sunk) compared with the same situation without an investment (e.g., watching a boring movie longer when it costs money than when it is free). When deciding about future investments, the rational normatively correct decision is to decide based on future consequences—which are the same if an investment has been made or not—not past investments (Heilbroner & Thurow, 1981). Most research on the sunk-cost fallacy is based on young adult college students (Arkes & Ayton, 1999). Compared with younger adults, older adults are less subject to the sunk-cost fallacy, are more likely to make normatively correct decisions (Strough, Mehta, McFall, & Schuller, 2008), and report greater resistance to sunk costs (Bruine de Bruin, Parker, & Fischhoff, 2007). The process whereby older adults arrive at decisions about sunk costs has not been investigated. Investigating why older adults make decisions that are more rational in comparison to the decisions made by younger adults may increase knowledge of the strengths and resources of the aging person. Age-related strengths are not as well documented as age-related deficits. Understanding older adults’ decisions also may inform interventions to improve decisions about sunk costs. Given that the implications of the sunk-cost fallacy are wide ranging—from people’s decisions about finances to government agencies’ investments in foreign wars—methods of improving such decisions across the life span are of practical significance. We investigated whether differences in younger and older adults’ decisions about sunk costs reflected differences in the issues they reported when describing their decision-making goals.

Individuals’ goals capture what is salient to them about a given situation and provide insight regarding age-related differences in the problem-solving process (Berg & Strough, 2010). Conceptual models of decision making emphasize the importance of considering situations from decision makers’ perspectives (Soman, 2004). Frisch (1993) assessed decision makers’ perspectives by asking younger adults to indicate whether two hypothetical situations differing only in the presence or absence of a prior investment (a sunk cost) should be treated the same or differently. Some young adults responded that the situations should be treated the same, and others responded that the situations should be treated differently to avoid “wasting” the investment. Theorists posit that loss aversion (Soman, 2004) and overgeneralization of the “waste not” heuristic (Arkes & Blumer, 1985) explain the sunk-cost fallacy.

Age-related differences in the salience of investment-related information about potential loss may mediate age-related differences in the sunk-cost fallacy. Younger adults demonstrate an information-processing negativity bias—that they weigh negative information more heavily than positive information (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001) such that “losses loom larger than gains” (Kahneman & Tversky, 1979). Older adults’ decisions reflect a more
balanced view of gains and losses (Wood, Busemeyer, Klohling, Cox, & Davis, 2005) and losses do not loom larger than gains (Mikels & Reed, 2009; cf. Weller, Levin, & Denburg, 2009). Drawing from this research, we investigated whether older adults focused less on information pertinent to a potential loss when describing their goals. We sought to determine if age-related differences in the salience of such information mediated age-related differences in decisions about sunk costs.

**METHODS**

**Participants**

Twenty younger adult college students (18–26 years, \( \text{M}_{\text{age}} = 19.45 \text{ years, } SD = 2.30, 60\% \text{ women} \)) and 21 community-dwelling older adults (61–84 years, \( \text{M}_{\text{age}} = 72.50 \text{ years, } SD = 5.15, 76\% \text{ women} \)) participated in exchange for $10.00. Data on race were missing for one older adult and nine younger adults; all participants who reported their race indicated that they were Caucasian. Sixty-five percent of older adults reported a high-school diploma as the highest degree earned, and 30% reported earning associate’s, bachelor’s, or master’s degrees. All younger adults had earned high-school diplomas.

**Procedure**

Interviewers called participants on the telephone and read decision-making vignettes to them. Each vignette was a member of a pair—the same pairs used by Strough and colleagues (2008) (adapted from Frisch, 1993; see Appendix). One pair member described a prior investment of money or time; in its no-investment analog, the investment was nonexistent or small. Pair members were separated by other vignettes, not presented back-to-back. After interviewers read the vignette, participants selected from one of five options for future investment. After participants made decisions for all vignettes, the interviewer reread each vignette, the decision made, and then asked participants about their goals (see Appendix). Participants’ audio-taped responses were transcribed verbatim and checked for accuracy.

**Coding**

Responses to the goal question were reliably segmented into idea units by two coders (intraclass \( r = .97 \) for number of idea units). An idea unit answered one “what” question, which contained a verb that formed the core idea and elaborations about “why,” “when,” “where,” “who,” or “how” (see Strough & Diriwächter, 2000).

Trained coders (blind to age group) independently coded each idea unit into one mutually exclusive and exhaustive category. Coding categories were derived from prior research (Frisch, 1993) and inductive and deductive techniques (King, 2004). Initial interrater reliability (average \( \kappa = .69 \)) was based on 19 transcripts. After establishing reliability, one coder completed the coding. A reliability check based on four new transcripts indicated that reliability improved, as indexed by the increase in the value of the kappa coefficient (average \( \kappa = .78 \)). Disagreements were resolved through consensus. Goal definitions, examples, and kappa coefficients are listed below.

**Goal Categories**

**Investment salience.**—Referencing the investment, including the desire to recover the prior investment (e.g., “I pay almost 11 bucks for it [movie],” “get my money’s worth,” “it [movie] was free, I ain’t losing nothing but time”; \( \kappa = .70 \)).

**Avoiding future waste.**—Avoiding wasting additional time/effort (e.g., “no reason to waste time with a bad movie”; \( \kappa = .69 \)).

**Alternatives.**—Referring to an alternative activity (e.g., “surely, I can find another hobby”; \( \kappa = .69 \)).

**Commitment.**—Seeing the situation through (e.g., “just to see it finished”; \( \kappa = .62 \)).

**Personal characteristics.**—Mentioning one’s own traits (e.g., “I am one of these persons that it takes a lot to get me bored”; \( \kappa = .68 \)).

**Improvement.**—Wanting the situation to improve, including through gathering more information (e.g., “I would want it to improve,” “give it a chance”; \( \kappa = .80 \)).

**Closure.**—Wanting to “move on” past the situation (e.g., “I would not want to pursue it”; \( \kappa = .70 \)).

**Other.**—A response not captured by the above categories or a comment (e.g., “can you repeat that?”; \( \kappa = .72 \)).

**Scores**

**Goal scores.**—A score was calculated to indicate whether a given category was present or absent in a participant’s response for each of the four vignettes (two investment vignettes and their no-investment analogs). If a given category was present, a score of “1” was assigned; if absent, a goal score of “0” was assigned. When responses included more than one idea unit and more than one category, a score of “1” was assigned for each category present (one category per idea unit). Scores were summed across the four vignettes (potential range 0–4).

**Sunk-cost fallacy scores.**—Following Klaczynski (2001), if the participant indicated investing more time for the
investment vignette than the analogous no-investment vignette, a score of 1 was assigned indicating the fallacy occurred; otherwise, the score was 0. Scores from the two vignette pairs were summed (range = 0–2).

**Normatively correct scores.**—If an exact match was present across analogs, a score of 1 was assigned to indicate a normatively correct decision (Klaczynski, 2001); otherwise, the score was 0. Scores from the two vignette pairs were summed (range = 0–2).

**RESULTS**

Preliminary analyses did not indicate significant vignette order effects or interactions with order. Nonparametric tests were used because the data did not meet all assumptions for parametric tests.

Replicating prior research, compared with younger adults, older adults were less subject to the sunk-cost fallacy, Mann–Whitney $U = 120$, $z = −2.66$, $p = .004$ (one-tailed test) and were more likely to make normatively correct decisions, $U = 153.50$, $z = −1.69$, $p = .05$ (one-tailed test; see Table 1).

To determine if goals mediated age-related differences in decisions, we conducted mediation analyses using Preacher and Hayes’s (2004) nonparametric bootstrapping framework with 5,000 resamples to estimate the indirect effect.

Greater age was associated with the lesser likelihood of the sunk-cost fallacy, $b = −.53$, $SE = 0.18$, $p = .003$ (one-tailed test) and the lesser likelihood of investment salience goals $b = −.81$, $SE = 0.34$, $p = .02$ (see Table 1). After controlling for age, investment salience goals were related to sunk-cost fallacy scores $b = .22$, $SE = 0.08$, $p = .01$. After controlling for goals, the relation between age and sunk-cost fallacy scores was reduced $b = −.35$, $SE = 0.18$, $p = .06$. The bootstrapped 95% confidence interval (−0.49 to −0.01) that tested whether the indirect effect was zero excluded a null effect, indicating significant mediation.

Greater age was associated with making normatively correct decisions, $b = .35$, $SE = 0.20$, $p = .04$ (one-tailed test) and the lesser likelihood of investment salience goals (reported above). After controlling for age, investment salience goals were related to normatively correct decisions $b = −.24$, $SE = 0.09$, $p = .007$. After controlling for goals, the relation between age and normatively correct decisions was reduced $b = .15$, $SE = 0.19$, $p = .44$. The bootstrapped 95% confidence interval (0.02–0.48) that tested whether the indirect effect was zero excluded a null effect indicating significant mediation.

Exploratory analyses indicated that younger adults were more likely than older adults to state a commitment to finishing the activity, $U = 126.00$, $z = −2.67$, $p = .008$, $r = .42$ (see Table 1). For younger adults, greater mention of commitment goals was associated with lesser mention of improvement goals and was marginally associated with lesser mention of goals for alternatives (see Table 2). For younger adults, investment salience goals were positively correlated with the sunk-cost fallacy and negatively correlated with normatively correct decisions; mentioning one’s personal characteristics was positively correlated with goals for closure and avoiding future waste. For older adults, greater mention of investment salience goals was correlated with goals for greater commitment and less closure and marginally positively correlated with the sunk-cost fallacy and marginally negatively correlated with normatively correct decisions (see Table 2).

**DISCUSSION**

Age-related differences in sunk-cost decisions were explained by the relatively lesser perceived salience of investment-related information to older adults as reflected in their goals. When investment-related information was more salient, people were more likely to demonstrate the sunk-cost fallacy and were less likely to make normatively correct decisions. Our findings are consistent with theories attributing the sunk-cost fallacy to loss aversion (Soman, 2004) and research on age-related differences in the salience of loss when making decisions (e.g., Wood et al., 2005). Dampened attention to losses may serve to maintain positive...
emotion. According to socioemotional selectivity theory (Carstensen, 2006), people are motivated to maximize their emotional experiences of the “here and now” when their temporal horizons are restricted (as is the case in later life because mortality is normatively associated with advanced age).

Additional research is required to determine if the lesser perceived salience of investment-related information to older adults reflects deliberative or heuristic modes of processing (see Peters, Hess, Västfjäll, & Auman, 2007). The lesser perceived salience of investment-related information pertinent to potential loss could be a consequence of cognitively effortful emotion-regulation strategies related to the positivity effect (Mather & Knight, 2005) or less effortful strategies reflecting age-related declines in cognitive ability (Mata, Schooler, & Rieskamp, 2007). For decisions about sunk costs, declines in cognitive ability may be offset by age-related increases in experience (Bruine de Bruine, Parker, & Fischhoff, 2010).

In addition to concerns about the lost investment (Soman, 2004) and avoiding waste (Arkes & Blumer, 1985), people reported goals pertaining to remaining committed, finding alternatives, and wanting the situation to improve. For younger adults, the salience of investment-related information was largely independent of other issues and concerns they mentioned when describing their goals. For older adults, the salience of investment-related information was related to motivation to move on to something else versus remain committed.

Practical Applications

Our results suggest that shifting temporal perspectives away from the lost investment in the past to the “here and now,” may reduce the sunk-cost fallacy, perhaps by increasing motivation to maximize gains (Molden & Hui, 2011) or by decreasing rumination about losses (van Putten, Zeelenberg, & van Dijk, 2010). Similarly, expanding older adults’ temporal perspectives could shift their motivational orientation (Fung & Carstensen, 2004) and increase the sunk-cost fallacy. Although increasing irrational decisions is usually undesirable, behavioral economists suggest that positive financial and health decisions can be facilitated by structuring environments to capitalize on decision-making fallacies (instead of intervening to reduce such fallacies; Thaler & Sunstein, 2008). Deposit contracts (an investment that is lost if a goal is not met) capitalize on the sunk-cost fallacy (Volpp et al., 2008). Our results suggest that deposit contracts may be less effective with older adults unless they are motivated to attend to their past investments.

Limitations and Conclusions

Our findings do not address the causal relation between the salience of investment-related information and decisions. We asked individuals about goals after they made decisions because justifying a decision beforehand can change decisions (Kim, Goldstein, Hasher, & Zacks, 2005). Moreover, individuals may not necessarily be aware of factors influencing their decisions (Wilson & Dunn, 2004). Age-related differences in the sunk-cost fallacy are a reliable and robust phenomenon. Demonstrating that the salience of investment-related information to older and younger adults accounts for age-related differences in sunk-cost decisions provides an initial understanding of aging and the decision-making process, as well as a foundation for future research.

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Table 2. Kendall’s Tau Correlations Among SCF Scores, Normatively Correct Decision Scores, and Goal Scores by Age Group

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SCF score</td>
<td>—</td>
<td>-.85**</td>
<td>.46*</td>
<td>-.13</td>
<td>-.21</td>
<td>.02</td>
<td>.00</td>
<td>.09</td>
<td>.16</td>
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<tr>
<td>2. NC score</td>
<td>-.62**</td>
<td>—</td>
<td>-.42*</td>
<td>-.18</td>
<td>.22</td>
<td>-.03</td>
<td>-.09</td>
<td>.00</td>
<td>-.06</td>
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<tr>
<td>3. Investment salience</td>
<td>.34†</td>
<td>-.37†</td>
<td>—</td>
<td>.06</td>
<td>-.31</td>
<td>-.04</td>
<td>.00</td>
<td>.03</td>
<td>.04</td>
</tr>
<tr>
<td>4. Avoid future waste</td>
<td>.02</td>
<td>.15</td>
<td>-.22</td>
<td>—</td>
<td>-.15</td>
<td>-.14</td>
<td>.54*</td>
<td>.09</td>
<td>.22</td>
</tr>
<tr>
<td>5. Alternatives</td>
<td>.24</td>
<td>-.21</td>
<td>.29</td>
<td>-.32</td>
<td>—</td>
<td>-.36†</td>
<td>-.09</td>
<td>-.10</td>
<td>-.17</td>
</tr>
<tr>
<td>6. Commitment</td>
<td>-.05</td>
<td>-.22</td>
<td>.53*</td>
<td>-.16</td>
<td>-.12</td>
<td>—</td>
<td>-.04</td>
<td>-.49*</td>
<td>.15</td>
</tr>
<tr>
<td>7. Personal characteristics</td>
<td>-.04</td>
<td>-.06</td>
<td>-.11</td>
<td>-.17</td>
<td>.19</td>
<td>-.08</td>
<td>—</td>
<td>-.03</td>
<td>.49*</td>
</tr>
<tr>
<td>8. Improvement</td>
<td>-.09</td>
<td>.01</td>
<td>-.08</td>
<td>.18</td>
<td>-.33</td>
<td>.02</td>
<td>-.07</td>
<td>—</td>
<td>-.16</td>
</tr>
<tr>
<td>9. Closure</td>
<td>-.29</td>
<td>.18</td>
<td>-.41*</td>
<td>.18</td>
<td>-.30</td>
<td>-.12</td>
<td>.02</td>
<td>-.12</td>
<td>—</td>
</tr>
</tbody>
</table>

Notes: Correlations above the diagonal are for younger adults (N = 20). Correlations below the diagonal are for older adults (N = 21). NC = normatively correct decision; SCF = sunk-cost fallacy.

†p < .10; *p < .05; **p < .01.
AGE AND DECISIONS ABOUT SUNK COSTS

REFERENCES


APPENDIX

Vignette Version: Investment

You are staying in a hotel room on vacation. You paid $10.95 to see a movie on pay TV. After 5 minutes, you are bored and wish that you were doing something else.

Think about this situation as you normally would. Which of the following courses of action would you select?

a. stop watching entirely  
b. watch for 10 more minutes  
c. watch for 20 more minutes  
d. watch for 30 more minutes  
e. watch until the end

You have been working on a project related to one of your hobbies for five years. Lately, you have lost interest in the project. Whenever you work on the project, you are bored and wish that you were doing something else.

Think about this situation as you normally would. Which of the following courses of action would you select?

a. stop working entirely  
b. work for 10 more minutes  
c. work for 20 more minutes  
d. work for 30 more minutes  
e. work until the end

Downloaded from http://psychsocgerontology.oxfordjournals.org/ by guest on November 8, 2016
a. stop working on the project immediately
b. wait for a couple of weeks to see if interest in the project increases
c. wait for a month or two to see if interest in the project increases
d. wait for six months to see if interest in the project increases
e. remain committed to the project

Vignette Version: Nonexistent or Smaller Investment
You are staying in a hotel room on vacation. You turn on the TV and there is a movie on. After 5 minutes, you are bored and the movie seems pretty bad. How much longer would you continue to watch the movie?

Think about this situation as you normally would. Which of the following courses of action would you select?

a. stop watching entirely
b. watch for 10 more minutes
c. watch for 20 more minutes
d. watch for 30 more minutes
e. watch until the end

You have been working on a project related to one of your hobbies for the past month. Lately, you have lost interest in the project. Whenever you work on the project, you are bored and wish that you were doing something else.

Think about this situation as you normally would. Which of the following courses of action would you select?

a. stop working on the project immediately
b. wait for a couple of weeks to see if interest in the project increases
c. wait for a month or two to see if interest in the project increases
d. wait for six months to see if interest in the project increases
e. remain committed to the project

Procedure Used to Elicit Goals
The Interviewer said to the participant, “For question 1, I read this story and question to you.” The Interviewer then reread the vignette to the participant. The interviewer then said, “You answered,” and read back the participant’s answer and said, “if that situation happened to you, what would your goal be? What would you want or not want to happen?” This process was repeated for each vignette. The question used to elicit goals is from Berg, Strough, Calderone, Sansone, and Weir (1998).