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Financial Literacy, Experience, and Age Differences in Monetary Sequence Preferences

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Financial Literacy, Experience, and Age Differences in Monetary Sequence Preferences

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Thesis submitted
to the Eberly College of Arts and Sciences
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in partial fulfillment of the requirements for the degree of

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Abstract

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Jenna Wilson

The emerging research on age differences in monetary sequence preferences suggests that older adults make decisions that are normatively correct from the standpoint of economic theory when choosing to receive larger versus smaller amounts of money sooner than later, but make non-optimal decisions about paying money. In an adult life-span sample ($N = 594$, aged 20-88, $M_{\text{age}} = 46.48$, $SD = 15.16$) recruited through MTurk, the present study examined age differences in monetary sequence preferences. Participants received eight hypothetical scenarios that described monetary events, and completed measures of financial literacy and financial experience. Older age was associated with preferences to receive larger amounts of money sooner than smaller amounts, the normatively correct decision, but age was not associated with preferences for sequences of paying money. Older adults' greater financial literacy and greater financial experience partially accounted for their normatively correct preferences for sequences of receiving money. Findings have implications such that interventions could target both financial literacy and experience to facilitate financial decision making across adulthood.

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Financial Literacy, Experience, and Age Differences in Monetary Sequence Preferences

People of all ages make financial decisions every day. Older adults control more financial resources than people in their 20s, and thus, have much more at stake (Agarwal, Driscoll, Gabaix, & Laibson, 2009). As the population age continues to increase dramatically, with a projected 17% of the world's population aged 65 and over by 2050 (He, Goodkind, & Kowal, 2015), it is critical to understand how financial decision making may change across adulthood.

When deciding how to receive or pay money, people may show preferences for increasing or decreasing installments, also referred to as monetary sequence preferences. Normative economic principles argue that for receiving money, one should take the larger amount of money sooner and the smaller amount later (i.e., decreasing installments; Loewenstein & Sicherman, 1991). For paying money with no accrued interest, one should pay the smaller amount sooner and the larger amount later (i.e., increasing installments). The rationale behind these monetary sequences is to maximize the current value of available liquid funds (Loewenstein & Sicherman, 1991).

Few studies to date have considered age differences in monetary sequence preferences. Those that have indicate that older adults make normatively correct sequence preferences for choices to receive money (Loewenstein & Sicherman, 1991; Strough et al., 2018), but non-normative choices to pay money (Strough et al., 2018). One aim of the current study was to examine how monetary sequence preferences when receiving versus paying money vary across adulthood.

Some research proposes that older adults make normatively correct decisions when receiving money due to having accumulated knowledge of the importance of maximizing the present value of funds through life experience (Loewenstein & Sicherman, 1991). When paying

money, it has been suggested that older adults may make non-normative choices due to older adults applying their prior financial experience, such as avoiding the accumulation of interest on a loan (Strough, Bruine de Bruin, & Parker, 2018). That is, older adults may make inferences about a scenario by applying their knowledge and experience to ‘go beyond’ the provided information (Strough et al., 2016). Furthermore, the literature on aging and financial decision making has yielded mixed findings. Some researchers have suggested that financial literacy scores are lower in old age (Finke, Howe, & Huston, 2016; Lusardi & Mitchell, 2011a; 2014), while others have argued that older adults’ financial literacy is greater in old age due to greater financial experience that may offset age-related cognitive decline (Li, Baldassi, Johnson, & Weber, 2013; Li et al., 2015). Therefore, the second aim of the present study was to explore financial literacy and financial experience as two constructs to understand how they are each uniquely associated with age and monetary sequence preferences.

Monetary Sequence Preferences

Studies on monetary sequence preferences have yielded inconsistent findings in preferences for sequences of receiving and paying money (Duffy & Smith, 2013; Prelec & Loewenstein, 1998; Read & Powell, 2002). College students showed preferences for receiving a fixed salary in increasing installments rather than decreasing installments (Duffy & Smith, 2013), which conflicts with the normative economic principle of maximizing the availability of liquid funds by receiving larger amounts of money sooner than smaller amounts (Loewenstein & Sicherman, 1991). In an age diverse sample, Read and Powell (2002) found that participants preferred to receive an unexpected monetary windfall in decreasing installments over a one year period, even when it amounted to less money overall. However, Read and Powell (2002) did not examine age differences in sequence preferences. For monetary payments with no interest on the

debt, preferences for paying larger amounts sooner than smaller amounts have been found even though paying the smaller amount sooner is more advantageous from the perspective of normative economic theory (Prelec & Loewenstein, 1998). Prelec and Loewenstein (1998) showed that participants were willing to overpay in their initial payment of a credit card bill if it led to a refund later. To date, only three studies have explored age differences in monetary sequence preferences.

Age and preferences for sequences of receiving money. One study found older age was associated with preferences for receiving decreasing wages and rental income over a five-year period (Loewenstein & Sicherman, 1991). Additionally, Strough and colleagues (2018) found that when presented with a hypothetical scenario depicting an uncommon event of receiving an unexpected inheritance over an unspecified timeline, older age was associated with preferences to receive larger amounts of money sooner than smaller amounts. These two studies showed older age was associated with normatively correct preferences for sequences to receive money. Moreover, Strough et al. (2018) is the only study to date that has investigated age differences in monetary sequence preferences by separately examining events of receiving versus paying money. Another study used real money earnings to explore age and monetary sequence preferences and did not find any evidence of age differences nor of normatively correct choices (Löckenhoff, Rutt, Samanez-Larkin, O'Donoghue, & Reyna, 2017).

Age and preferences for sequences of paying money. For paying money, Strough and colleagues (2018) found that older age was associated with preferences to pay larger amounts sooner than smaller amounts. Their findings suggested that older adults make normatively correct decisions for receiving money, but not for paying money. However, the vignette used in their study did not explicitly state a reason for paying money, nor did it specify a timeline over

which the payments were to be made (Strough et al., 2018). The lack of specification in the vignette may have resulted in older adults augmenting the scenario by applying their experience to ‘go beyond’ the provided information, as noted above (Strough et al., 2016). Consequently, this may have influenced older adults’ greater preference for paying larger amounts of money sooner, if they believed that paying more money up front would allow them to avoid paying interest on the debt, for example. When interest does not accrue, preferences for paying larger amounts sooner conflict with normative economic principles because it does not allow for the maximization of the current value of available funds (Loewenstein & Sicherman, 1991).

Moreover, Strough and colleagues (2018) found that older age was associated with greater self-reported use of domain-general experience when making decisions, and that greater experience was associated with non-normative preferences to pay money. Although they did not find evidence of experience accounting for older adults’ non-normative decisions to pay money, findings suggested that experience may play an important role in financial decision making. Whereas Strough et al. (2018) assessed domain-general experience, domain-specific financial experience may be important for understanding age differences in monetary sequence preferences. In the next section, financial experience is discussed.

Financial Decision Making

Financial literacy can be thought of as the comprehension of basic economic concepts and information, as well as the ability to apply economic principles to make informed financial decisions, such as those related to debt, pensions, and wealth accumulation (Hung, Parker, & Yoong, 2009b; Lusardi & Mitchell, 2014). Financial literacy has important implications for well-being during the work-life, as well as in retirement (Lusardi & Mitchell, 2014). Those with greater financial literacy tend to be savvier at saving, investing, and debt management, undertake

more retirement planning, and accumulate more wealth (Lusardi & Mitchell, 2007; 2011a). Those with low financial literacy tend to be more likely to have costly mortgages (Moore, 2003), excessive debt (Lusardi & Tufano, 2009), engage in costly credit card behavior (Mottola, 2013), and accumulate less wealth (Stango & Zinman, 2009). Overall, levels of financial literacy have shown to be quite low among the U.S. population (Lusardi & Mitchell, 2014).

Individual demographic characteristics have also shown to be associated with financial literacy. Those without a college education are less familiar with financial concepts (Lusardi & Mitchell, 2011b), and those with low income are less financially savvy (Lusardi & Tufano, 2009). African Americans and Hispanics in the U.S. show the lowest levels of financial literacy (Lusardi & Mitchell, 2007; 2011b), and scores are highest among whites (Finke et al., 2016). Financial literacy scores have also been shown to be higher among men (Finke et al., 2016; Lusardi & Tufano, 2009; Lusardi & Mitchell, 2011b) and those who are married (Finke et al., 2016). Those living in rural areas usually score lower on financial literacy, compared to those living in urban and suburban areas (Klapper & Panos, 2011). Age-related patterns of financial literacy, however, have shown mixed findings, as is discussed in the next section (Finke et al., 2016; Li et al., 2013; Li et al., 2015; Lusardi & Mitchell, 2014).

Age, financial literacy and financial experience. Some research on age and financial literacy posits that there is an inverted U-shaped pattern, with the lowest levels of financial literacy among the young and the old (Lusardi & Mitchell, 2014). Lusardi and Mitchell (2011a) designed three questions to assess financial literacy based on numeracy, and understanding of inflation and risk diversification. This set of questions has been widely implemented in several large U.S. surveys. In the 2004 Health and Retirement Survey (HRS) of a representative sample of U.S. adults (age 50+), only about one third could answer all three questions correctly (Lusardi

& Mitchell, 2011a). Findings from the 2004 HRS suggested that the adult U.S. population is financially illiterate (Lusardi & Mitchell, 2014).

Another nationally representative sample of U.S. adults (age 60+) used a different measure of financial literacy that assessed four topic areas: basic financial concepts, insurance, investments, and credit knowledge (Finke et al., 2016). Findings indicated that age was a strong predictor of financial literacy, with scores lowest in old age, even when controlling for other demographic characteristics. Additionally, the negative association between age and financial literacy was consistent among the four different topic areas (Finke et al., 2016), suggesting that overall financial literacy levels are low among older adults.

A potential explanation for low financial literacy in older age may be attributed to age-related cognitive decline. Fluid and crystallized intelligence are two distinct components of general intelligence (Horn & Cattell, 1967) that are important in decision making (Li et al., 2013). Fluid abilities, such as executive functioning, processing speed and efficiency show a trend of decline beginning in early adulthood into old age (Salthouse, 2004). Fluid cognitive abilities are associated with better performance on both hypothetical decision tasks, as well as better real-world financial decisions (see Bruine de Bruin, 2017 for a review). Age-related cognitive decline in fluid intelligence is associated with worse performance on cognitively-demanding economic decisions (Li et al., 2013).

Financial literacy often includes numeracy skills and the capacity to do calculations, such as those related to interest rates (Lusardi & Mitchell, 2014). Additionally, prior work has found a positive relationship between financial literacy and measures of fluid intelligence such as numeracy (Banks, O’Dea, & Oldfield, 2010; McArdle, Smith, & Willis, 2009). Because worse performance on mathematical tasks in old age may be attributed to declining fluid abilities, age-

related cognitive decline might explain older adults' lower financial literacy. Furthermore, Finke and colleagues (2016) examined the impact of fluid intelligence, measured by word recall, and crystallized intelligence, measured by a vocabulary test, on the association between age and financial literacy scores. Findings indicated that the association remained statistically significant even when controlling for cognitive abilities, but the magnitude of the association was reduced (Finke et al., 2016). It is important to note that Finke and colleagues' (2016) measure of crystallized intelligence only measured vocabulary, rather than domain-specific financial experience. Therefore, it is unclear how older adults' financial experience may relate to their financial literacy.

One study investigated life-cycle patterns in financial mistakes and found a U-shaped pattern, with middle-aged adults making fewer mistakes than younger and older adults (Agarwal et al., 2009). It was hypothesized that the U-shape can be explained by younger adults' relatively high analytical function and low levels of experience, whereas older adults tend to have high levels of experience and low levels of analytic function. While some research suggests that old age is associated with less financial literacy (Finke et al., 2016; Lusardi & Mitchell, 2014), others argue that old age is associated with greater financial literacy (Li et al., 2013; Li et al., 2015). Researchers have posited that older adults' crystallized abilities may compensate for age-related declines in fluid abilities (Li et al., 2013; Li et al., 2015). This form of intelligence is the knowledge that is acquired through accumulated life experience, and these abilities increase throughout young adulthood into the 60s, and then plateau (Salthouse, 2004). Moreover, crystallized intelligence has been shown to be a strong predictor of performance on financial decision making tasks (see Hershey et al., 2015 for a review).

Li and colleagues (2013) found that financial literacy was associated with better financial decisions in the laboratory, and that older age was associated with greater financial literacy (Li et al., 2013). These findings of greater financial literacy in old age contrast with prior work (e.g., Lusardi & Mitchell, 2014). Additionally, they found that older adults' lower fluid intelligence was related to worse decision performance and financial literacy, but that higher levels of domain-general crystallized intelligence offset the age-related declines in fluid abilities and financial literacy to some degree (Li et al., 2013). Furthermore, another study found that older adults' better financial decision making was partially accounted for by their greater experience-based knowledge (Eberhardt, Bruine de Bruin, & Strough, 2018). Thus, it has been argued that older adults' accumulated financial experience may compensate for potential age-related cognitive declines related to financial decision making (Li et al., 2013; 2015). However, as prior research has focused on domain-general measures of crystallized abilities (Finke et al., 2016; Li et al., 2013), it remains unclear how domain-specific financial experience may affect the associations among age, financial literacy, and financial decision making.

Among studies that find associations between older age and greater financial literacy (Li et al., 2013), older adults' accrued life experience with financial tasks may be one potential explanation for greater financial literacy (see Bruine de Bruin, 2017 and Hershey et al., 2015 for reviews). Financial literacy and financial experience are two distinct constructs because literacy is a form of fluid intelligence, whereas experience is a form of crystallized intelligence. When investigating financial experience and literacy, however, it is important to recognize that certain financial tasks are connected to particular life stages or ages, such as a home mortgage and retirement planning (Hershey et al., 2015). Individual exposure to financial tasks may also influence financial literacy (Hershey et al., 2015). Therefore, since greater experience with

financial tasks may affect financial literacy, it is expected that financial experience and financial literacy would be positively correlated. The current study examined both financial literacy and financial experience to understand how they are independently related to financial decision making.

Statement of the Problem

Every day, people of all ages make decisions about receiving and paying money. As population age continues to increase dramatically (He et al., 2015) and the net worth of older adults is greater than that of younger cohorts (Lusardi & Mitchell, 2007), it is essential to understand how financial decision making may change across adulthood. Research on age differences in monetary sequence preferences indicates that older adults make normatively correct decisions for receiving money (Loewenstein & Sicherman, 1991; Strough et al., 2018), but decisions that are incorrect from the perspective of normative economic theory when paying money (Strough et al., 2018). Some research has speculated that older adults' knowledge of the present value of money may account for their preferences for receiving money (Loewenstein & Sicherman, 1991), and that their real-world experience with financial decisions, such as those that involve avoiding the accumulation of interest on loans, may explain their choices for paying money (Strough et al., 2018).

Research on aging and financial literacy is mixed. Yet, understanding the association between age and financial literacy has important implications for the well-being and fortune of people of all ages. Since greater financial literacy is associated with savvier saving, more retirement planning, and the accumulation of wealth (Lusardi & Mitchell, 2007; 2011a), it is imperative to understand how financial literacy may change across adulthood. Some researchers have suggested that financial literacy is lower in old age (Finke et al., 2016; Lusardi & Mitchell,

2011a; 2014), while others argue that financial literacy is greater in old age, which may be attributed to experience compensating for age-related cognitive decline in fluid abilities (Li et al., 2013; 2015). The present study addressed limitations of the existing literature which has tended to focus on links between decisions and domain-general experience (Li et al., 2013; Strough et al., 2018) by investigating taking a domain-specific approach. Specifically, the current study sought to understand how financial literacy and financial experience are uniquely associated with age differences in sequence preferences for both receiving and paying money.

Current Study

The overall goal of the current study was to test age differences in monetary sequence preferences. Research Aim 1 was to replicate and extend prior research on age differences in monetary sequence preferences by using a greater number of vignettes that correspond to people's real-life experiences with receiving (e.g., wages) and paying (e.g., loans) money.

Research Question 1. Is age associated with normatively correct preferences for sequences of receiving (i.e., preferring to receive larger amounts of money sooner than later) and paying (i.e., preferring to pay smaller amounts of money sooner than later) money?

Hypothesis 1a. Older age will be associated with normatively correct preferences for sequences of receiving money (Loewenstein & Sicherman, 1991; Strough et al., 2018).

Hypothesis 1b. Older age will not be associated with normatively correct preferences for sequences of paying money (Strough et al., 2018).

No prior research on monetary sequence preferences has taken a domain-specific approach to experience by investigating financial literacy and financial experience. Additionally, research on aging and financial literacy has yielded inconsistent results. Aim 2 was to address the

limitations of existing literature by using financial literacy and financial experience as two unique constructs.

Research Question 2. Are financial literacy and financial experience associated with age and normatively-correct preferences for sequences of receiving and paying money?

Hypothesis 2a. Although the literature on age and financial literacy has shown mixed findings, older adults may have greater financial knowledge due to life experience with financial tasks (see Bruin de Bruin, 2017 for a review) which may boost their financial literacy. As such, it is hypothesized that older age will be associated with greater financial literacy (Li et al., 2013; Li et al., 2015).

Hypothesis 2b. Older age will be associated with greater financial experience (Bruin de Bruin, 2017; Hershey et al., 2015).

Hypothesis 2c. Greater financial literacy will be associated with normatively correct preferences for sequences of receiving money (Lusardi & Mitchell, 2007; Lusardi & Tufano, 2009; Moore, 2003).

Hypothesis 2d. Greater financial experience will be associated with normatively correct preferences for sequences of receiving money (Bruin de Bruin, 2017; Eberhardt et al., 2018; Hershey et al., 2015).

Hypothesis 2e. Greater financial literacy and financial experience will statistically account for age-related variance in normatively correct preferences for sequences of receiving money (Bruin de Bruin, 2017; Eberhardt et al., 2018; Hershey et al., 2015; Li et al., 2013; Li et al., 2015; Loewenstein & Sicherman, 1991; Strough et al., 2018).

Hypothesis 2f. Greater financial literacy will be associated with normatively correct preferences for sequences of paying money (Lusardi & Mitchell, 2007; Lusardi & Tufano, 2009; Moore, 2003).

Hypothesis 2g. Greater financial experience will be associated with non-normative preferences for sequences of paying money (Strough et al., 2018).

Hypothesis 2h. Greater financial experience, but not financial literacy, will statistically account for age-related variance in preferences to pay larger amounts of money sooner than smaller amounts. Strough et al. (2016) argued that older adults' non-optimal preferences (from the perspective of normative economic theory) to pay larger amounts sooner than smaller amounts may be due to older adults incorrectly applying their financial experiences. That is, older adults may 'go beyond' the information in the vignettes (Strough et al., 2016), and apply their experience with benefits of paying more up front to avoid paying interest on a debt. Indeed, prior research found that older age was associated with greater reported use of experience when making decisions, but that experience was associated with preferring to pay larger amounts of money sooner than smaller amounts (Strough et al., 2018). Although greater experience did not account for older adults' preferences for sequences of decreasing payments in that study, Strough et al. (2018) used a domain-general measure of experience whereas a domain-specific measure of experience is used in the current research.

Method

Participants

Participants ($N = 888$) living within the United States were recruited through Amazon's Mechanical Turk (MTurk). Workers in the present study had HIT approval ratings of 95% or higher. MTurk allows for rapid collection of data, and typically provides a more

demographically diverse participant pool than community samples (Buhrmester, Kwang, & Gosling, 2011; Paolacci & Chandler, 2014; Weigold, Weigold, & Russel, 2013). Additionally, data collected through MTurk have been found to be as reliable and valid as data obtained through other self-report surveys (Buhrmester et al., 2011). Workers' self-reported demographic information, including age, has been shown to be consistent over a 6-month period (Mason & Suri, 2012). Although less is known about MTurk workers' cognitive abilities, one study examined a self-report measure of numeracy to assess quantitative abilities and found no differences between undergraduates, MTurk workers, and other Internet users (Paolacci, Chandler, & Ipeirotis, 2010).

A stratified sampling strategy was used to recruit an age diverse sample: 322 younger adults (aged 20-39), 304 middle-aged adults (40-59), and 262 older adults (60+). Participants were asked to report their current age three different times throughout the survey. Fifty-eight participants inconsistently reported their age on at least one of these questions, and were excluded, leaving 830 participants (aged 20-88, $M_{\text{age}} = 45.60$, $SD = 14.99$)¹. Of the 830 participants, 236 participants did not report any demographic information, except for their age. When comparing participants who did not report demographic characteristics to those who did report demographic characteristics, the two groups differed significantly based on age, $F(1, 828) = 7.21$, $p = .01$. The participants who provided all demographic information were older than the participants who had missing demographic information ($M = 46.48$, $SD = 15.16$ vs. $M = 43.39$, $SD = 14.33$)². Analyses were based on data from participants who provided demographic

¹ Participants who were excluded did not significantly differ from those included based on gender, race/ethnicity, education, employment, income, marital status, or type of area of residence.

² A chi-square analysis showed that the distribution of participants who did not report demographic information differed significantly based on age group, $\chi^2(2, N = 830) = 7.46$, $p =$

information ($N = 594$). The final sample (aged 20-88, $M_{\text{age}} = 46.48$, $SD = 15.16$) was primarily female (54%) and predominately White (83.8%). For additional demographic information see Table 1.

Procedure

Participants were recruited through MTurk and were informed that the study's purpose was to examine attitudes, personality, emotions, and experiences. Participants completed the study measures as part of a larger study. Each participant received a \$1.00 honorarium in exchange for their time³. The study was approved by the West Virginia University Institutional Review Board.

This study was a within-subjects design where participants saw both receiving and paying monetary vignettes. Age and all other measures were continuous variables. All measures relevant to the current report were presented to participants in a randomized order, except for the demographic questions which appeared last.

Measures

Monetary sequences. Participants were presented with eight monetary vignettes: four about receiving money (e.g., inheritance, rental income), and four about paying money (e.g., mortgage, loans; see Appendix A). Four vignettes were from prior research (Loewenstein & Sicherman, 1991; Strough et al., 2018), and the other four were designed for the present study. Extending prior research, these vignettes stated a reason for making payments over a specified

.02. Of the participants who did not report demographic characteristics, the majority were younger adults aged 20-39 (43.6%), followed by middle-aged adults 40-59 years (35.2%) and older adults aged 60+ (21.2%).

³ The average time to complete the survey was 189.87 minutes ($SD = 1,634.40$). Six participants took over one day to complete the survey. Analyses were conducted excluding these participants; however, the pattern of results was similar. Thus, the results are reported with all 594 participants.

timeline. For each scenario, the response scale ranged from 1 (*start with larger amounts first, end with the smaller*) to 6 (*start with smaller amounts first, end with the larger*). Preferences for the largest monetary installment sooner rather than later were indicated with lower scores for both receiving and paying money. Responses were averaged across the four scenarios of receiving ($\alpha = .83$) and paying money ($\alpha = .83$) to compute two composite scores, respectively. Normatively correct preferences for maximizing current value of funds were indicated with lower scores for receiving money, but higher scores for paying money.

Financial literacy. Participants completed a 13-item questionnaire to assess financial literacy (Fernandes, Lynch, and Netemeyer 2014; see Appendix B). Items assessed a variety of financial decisions, such as those related to investing, stocks, and interest rates. An example question was “Do you think that the following statement is true or false?: Bonds are normally riskier than stocks.” All responses were scored based on correct responses (1) and incorrect responses (0). Participants had the option of selecting “don’t know” or “refuse to answer,” which was scored as an incorrect response. Scores were averaged across all items, and higher scores indicated greater financial literacy ($M = .61$, $SD = .24$, $\alpha = .80$).

Financial experience. Twenty self-report items assessed participants’ experience-based knowledge with different financial instruments (Li et al., 2015; see Appendix C). Participants rated their experience with each item (e.g., *checking account, student loan, mortgage*) on a scale from 1 (*never heard of it*) to 6 (*have a lot of personal experience with it*). A composite score was created by taking the average across all items. Higher scores indicated greater financial experience ($M = 4.16$, $SD = 0.64$, $\alpha = .88$).

Demographics. Participants reported their age, gender, race/ethnicity, educational attainment, income, employment status, type of area of residence, and marital status (see Appendix D).

Results

Preliminary Analyses

Before conducting the main analyses, four independent samples *t*-tests were conducted on all key variables to compare participants who reported all demographic information to the 236 participants who did not report any demographic information except age. No significant differences were found between groups on preferences for sequences of receiving ($p = .76$) or paying ($p = .11$) money, nor on financial experience ($p = .59$). There was a significant difference in financial literacy scores, $t(324.59) = -10.91, p < .001$. Participants who did report demographic information had greater financial literacy ($M = .61, SD = .24$) than participants who did not report demographic information ($M = .34, SD = .36$).

Descriptive statistics for study variables are shown in Table 1. Next, checks for univariate, bivariate, and multivariate violations of assumptions were completed. At the univariate level, no variables appeared to pose significant problems regarding skewness and kurtosis. There were three outliers on the measure of financial experience⁴. Pearson's *r* correlations were also checked for potential violations (see Table 2). Correlations between some variables were small to moderate, while others were not significantly associated. There were no violations of multicollinearity, with all tolerance scores above 0.20 and variance-inflation factors below 4.0.

⁴ Results did not differ when the outliers were excluded.

Since prior research has shown that financial literacy differs based on demographic characteristics (Finke et al., 2016; Klapper & Panos, 2011; Lusardi & Mitchell, 2007; 2011b), potential covariates were examined. Preferences for sequences of receiving money did not differ based on any demographic characteristics. Preferences for sequences of paying money differed significantly based on participant gender. Men ($M = 2.82$, $SD = 1.41$) were more likely than women ($M = 2.51$, $SD = 1.32$) to prefer paying smaller amounts of money sooner than larger amounts. Significant differences in financial literacy and financial experience based on participant demographics were found (see Table 3). Financial literacy was highest among males, Whites, those with a bachelor's degree or more, and those with an income over \$40k. Financial experience was highest among males, Whites, those with a bachelor's degree or more, those employed full-time, those married, and those with an income over \$40k.

Is age associated with normatively correct preferences for sequences of receiving and paying money?

To test Hypothesis 1a, that older age was associated with normatively correct preferences for sequences of receiving money, and Hypothesis 1b, that older age was associated with non-normatively correct preferences for sequences of paying money, a repeated measure analysis of variance (ANOVA) was conducted. Receiving versus paying money was a within-subject variable and age was a continuous covariate, participant gender was controlled. There was a main effect of receiving versus paying money, $F(1, 591) = 9.40$, $p = .002$, $\eta^2 = .02$. Because the means for both sequence preferences (to receive and pay money) tended toward the anchor of "larger sooner," the difference indicated that preferring to pay money sooner ($M = 2.65$, $SD = 1.37$) was stronger than preferring to receive money sooner ($M = 3.18$, $SD = 1.49$). Further, the marginally significant association between age and sequence preferences, $F(1, 591) = 3.70$, $p =$

.06, $\eta^2=.01$, was modified by an interaction with whether the money was to be received versus paid, $F(1, 591) = 9.68, p = .002, \eta^2=.02$ (see Figure 1). Older age was significantly associated with preferring to receive larger amounts of money sooner than smaller amounts ($r = -.14, p = .001$). Age was not associated with preferences for sequences of paying money ($r = .03, p = .41$). To test if the association between age and receiving money significantly differed from the association between age and paying money, Fisher's r to z transformation was used. The difference between the correlations was significant, $z = -2.94, p = .003$, indicating that the association between sequence preferences and age was stronger for receiving than paying money. Therefore, Hypothesis 1a was supported, such that older age was associated with normatively correct preferences for sequences to receive larger amounts of money sooner than smaller amounts. Age was not associated with preferences for sequences of paying money, thus Hypothesis 1b was not supported.

Are financial literacy and financial experience associated with age and normatively correct preferences for sequences of receiving and paying money?

Financial literacy and financial experience were moderately correlated ($r = .51, p < .001$). Since prior work has not examined financial literacy and experience independently with age and monetary sequence preferences, subsequent correlations were conducted with and without controlling for each financial variable to investigate their unique contribution (see Table 2).

Age. Older age was significantly associated with greater financial literacy ($r = .18, p = .001$), which supported Hypothesis 2a. However, after controlling for financial experience, there was no longer a significant association between age and financial literacy ($p = .04$). Older age was also significantly associated with greater financial experience ($r = .30, p < .001$), and the

association remained statistically significant when controlling for financial literacy ($r = .25, p < .001$). This finding supported Hypothesis 2b.

Receiving money: sequence preferences. Greater financial literacy was associated with preferences for sequences of receiving larger amounts of money sooner than later ($r = -.16, p < .001$), even after controlling for financial experience ($r = -.08, p = .04$). Thus, Hypothesis 2c, that greater financial literacy would be associated with normatively correct preferences for sequences to receive money, was supported.

Greater financial experience was also associated with preferences for receiving larger amounts of money sooner than later ($r = -.17, p < .001$), even after controlling for financial literacy ($r = -.10, p = .01$). Thus, Hypothesis 2d, that greater financial experience would be associated with normatively correct preferences for sequences to receive money, was supported. Therefore, both greater financial literacy and experience were each associated with normatively correct preferences for sequences to receive larger amounts of money sooner than later.

To determine whether financial literacy and financial experience statistically accounted for age-related variance in preferences for sequences of receiving money, the PROCESS macro for SPSS with 5,000 bootstrapped samples was used (Hayes, 2017). Financial literacy and financial experience were entered as simultaneous, parallel mediators. Since greater financial literacy and experience were significantly associated with participant gender, race/ethnicity, education, income, employment, and marital status, these demographic characteristics were entered as covariates.

The overall model explained 25.8% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.61, p < .001$. As shown in Figure 2, older age was associated with preference to receive larger amounts of money sooner than later, as well as greater financial

literacy and financial experience. Greater financial literacy and greater financial experience were both associated with preferences to receive larger amounts of money sooner than later. There was a significant indirect effect of age on preferences for sequences to receive money through both financial literacy ($b = -.002$, 95% CI $[-.004, -.0002]$, $p = .03$) and financial experience ($b = -.004$, 95% CI $[-.007, -.0006]$, $p = .01$). After including the significant indirect paths through financial literacy and financial experience, the direct effect ($b = -.012$, $p = .008$) of age on preferences for sequences to receive money was no longer significant ($b = -.006$, $p = .17$). This indicated that older adults' normatively correct preferences for sequences of receiving larger amounts of money sooner than smaller amounts were accounted for by financial literacy and financial experience⁵. Hypothesis 2e, that financial literacy and financial experience would statistically account for age-related variance in normatively correct preferences for sequences of receiving money, was supported.

Paying money: sequence preferences. Greater financial literacy was associated with preferences for sequences of paying larger amounts of money sooner than later ($r = -.16$, $p < .001$), even when controlling for financial experience ($r = -.13$, $p = .002$). Thus, Hypothesis 2f, that greater financial literacy would be associated with normatively correct preferences for sequences of paying money, was not supported.

Greater financial experience was also associated with preferences for sequences of paying larger amounts of money sooner than later ($r = -.11$, $p = .009$). Thus, Hypothesis 2g, that greater financial experience would be associated with non-normative preferences for sequences of paying money, was supported. Additionally, after controlling for financial literacy, there was

⁵ When demographic characteristics were not controlled for, the indirect effect of age through financial experience was no longer significant ($b = -.003$, 95% CI $[-.006, .0003]$). The indirect effect of age through financial literacy remained significant ($b = -.002$, 95% CI $[-.004, -.0001]$).

no longer a significant association between financial experience and preferences for sequences of monetary payments ($p = .48$).

Next, indirect effects of age on preferences for sequences of paying money were examined. Financial literacy and financial experience were entered as simultaneous, parallel mediators. Since greater financial literacy and experience were significantly associated with participant gender, race/ethnicity, education, income, employment, and marital status, these demographic characteristics were entered as covariates. The overall model explained 26.8% of the variance in preferences for sequences to pay money, $F(9, 584) = 4.66, p < .001$. Age was not associated with preferences for sequences of paying money, but older age was associated with greater financial literacy and financial experience. Greater financial literacy and financial experience were both associated with preferences to pay larger amounts of money sooner than later. There was a significant indirect effect of age through financial literacy ($b = -.003, 95\% \text{ CI } [-.005, -.001], p < .001$), but not financial experience ($b = -.002, 95\% \text{ CI } [-.005, .001], p = .20$). Thus, Hypothesis 2h, that greater financial experience, but not financial literacy, would statistically account for age-related variance in preferences for sequences to pay money was not supported. As shown in Figure 3, after including the one significant indirect path, the nonsignificant direct effect of older age on preferences for sequences to pay money ($b = .004, p = .37$) was *stronger*—and marginally significant compared to when the path was not taken into account ($b = .008, p = .05$). That is, there was a suppressor effect, where controlling for the path through financial literacy amplified the association between older age and preferences to pay larger amounts of money sooner than smaller amounts. Hence, older age was associated with reporting preferences to pay smaller amounts of money sooner than larger amounts when taking into account older adults' greater financial literacy.

Discussion

People of all ages make financial decisions that can have implications for their well-being and fortune. The current findings add to the literature on age differences in monetary sequence preferences by examining domain-specific experience, measured as financial literacy and financial experience. Older age was associated with preferences for sequences of receiving money that aligned with normative economic principles, and that financial literacy and financial experience partially accounted for older adults' normatively correct decisions. Moreover, age was unrelated to preferences for sequences of monetary payments. This is the first study to my knowledge to separately examine the roles of financial literacy and financial experience to understand how they are each uniquely related to age and monetary sequence preferences.

Is age associated with normatively correct preferences for sequences of receiving and paying money?

Older age was significantly associated with preferences for receiving larger amounts of money sooner than smaller amounts in a sequence, which replicated previous findings (Loewenstein & Sicherman, 1991; Strough et al., 2018) and is consistent with normative economic principles (Prelec & Loewenstein, 1998). Previous work has shown that older age was associated with preferences to receive larger amounts of money sooner than smaller amounts for wages and rental income over a five-year period (Loewenstein & Sicherman, 1991), and an unexpected inheritance over an unspecified timeline (Strough et al., 2018). The present findings extended prior work by including a greater number of vignettes that depicted a variety of scenarios, thus further demonstrating the reliability of the association between older age and monetary sequence preferences. Additionally, these results are consistent with research that indicates that older adults are more likely to make decisions that align with economic principles

compared to younger adults (Bruine de Bruine, Strough, & Parker, 2014; Li et al., 2014; Strough et al., 2007).

Age was not associated with preferences for sequences of monetary payments, which conflicts with prior research that showed older age was associated with non-normatively correct preferences for sequences to pay larger amounts of money sooner than smaller amounts (Strough et al., 2018). Vignettes in the present study explicitly stated a reason for making payments over a specified timeline, which extends previous research which lacked such details (e.g., Strough et al., 2018). Older adults in previous research may have felt as though paying more money up front had emotional utility by avoiding anticipatory dread of looming payments (Loewenstein, Weber, Hsee, & Welch, 2001). Older adults relative to younger adults are more focused on goals related to emotion regulation and maximizing positive affect (Charles & Carstensen, 2010). Stating a reason for paying money and a timeline over which the payments would be made, may have reduced potential dread about future payments, and thus account for the lack of age differences in preferences for sequences that involved monetary losses in the current study.

Taken together, these results demonstrate the importance of separately examining financial decisions related to receiving and paying money, which appeared to be differentially associated with age. Older adults' normatively correct decisions may be limited to scenarios about sequences pertaining to receiving money, but not paying it. Thus, interventions for improving financial decision making could focus on how to best sequence monetary payments, whereas interventions geared towards decisions about sequencing the receipt of money could mostly target younger adults.

Are financial literacy and financial experience associated with age and normatively correct preferences for sequences of receiving and paying money?

Financial literacy and financial experience were moderately associated with each other. Research has suggested that experience in the form of exposure to financial tasks may be associated with higher levels of financial literacy (Hershey et al., 2015). The results are consistent with this idea.

Age. Older age was significantly associated with greater financial experience, which replicates research that showed older age was associated with more financial experience-based knowledge (Li et al., 2015; Eberhardt et al., 2018). The association between older age and greater financial experience remained statistically significant after partialling out the effects of financial literacy.

Some prior research suggests that older age is associated with less financial literacy (Finke et al., 2016; Lusardi & Mitchell, 2011a; 2014), while others argue that older age is associated with greater financial literacy (Li et al., 2013; Li et al., 2015). It has been posited that crystallized intelligence (as a proxy for experience) may offset age-related cognitive decline in fluid abilities, and thus be reflected in greater financial literacy with age (Li et al., 2013). Present findings support the argument by Li et al. (2013), such that older age was associated with greater financial literacy, but this association disappeared after partialling out the effects of financial experience. Follow-up analyses tested financial experience as a mediator of the direct effect of age on financial literacy and revealed a significant indirect path (see Appendix E), suggesting that domain-specific financial experience statistically explains the relation between older age and greater financial literacy. These results align with research that has posited that older adult's accrued life experience with financial tasks may facilitate greater financial literacy in old age (see Hershey et al., 2015 for a review). Training in financial decision making, such as being exposed to and learning basic concepts and rules may be particularly beneficial. If possible,

trainings should begin early in life because financial decision making occurs across the life span (see Bruine de Bruine, 2017 for a review) and it can take many years of practice to cultivate expertise (Ericsson, Prietula, & Cokely, 2007).

Findings of the current study also suggest that interventions to improve financial decisions making across adulthood should focus on both financial literacy and financial experience, as they are each uniquely related to age. Indeed, further investigating domain-specific financial experience may reconcile conflicting findings on age and financial literacy from prior research (Finke et al., 2016; Lusardi & Mitchell, 2011b; Li et al., 2013). That is, as noted above, supplementary analyses in the current study suggested that financial experience explained the relation between age and financial literacy. Future research could investigate how domain-specific financial experience is associated with other real-life financial decisions and behaviors across adulthood, such as those related to retirement savings and the management of wealth in old age.

Preferences for sequences of receiving money. Financial literacy and financial experience were associated with preferences to receive larger amounts of money sooner than smaller amounts. Additionally, the associations remained statistically significant even when controlling for one another. Prior work on age differences in financial decision making used domain-general measures of crystallized abilities (Finke et al., 2016; Li et al., 2013). Current findings add to the literature on monetary sequence preferences by taking a domain-specific approach to understanding the role of financial experience, and suggest that both financial literacy and experience help people make financial decisions that conform to normative economic principles. Moreover, this aligns with research which has found that greater financial literacy is associated with the accumulation of more wealth (Lusardi & Mitchell, 2007).

Findings also demonstrate the unique properties of each construct and suggest that interventions for promoting informed financial decision making could target both financial literacy and financial experience as ways to improve decisions. Experience with common financial tasks such as checking accounts, credit cards and 401K plans, appear to be particularly important for making normatively correct decisions for receiving money. Some financial mathematical rules can be taught with training, such as calculating an interest rate, which may reduce the cognitive demands of financial tasks and help combat age-related decline in fluid abilities (McArdle et al., 2009). Financial education programs should target subgroups to address the diverse needs of people (Lusardi & Mitchell, 2009), such as building on certain strengths to help compensate for weaknesses (Bruine de Bruin & Bostrom, 2013). Although financial literacy is one area to target to improve financial behaviors, a meta-analysis found that the long-term effects of financial education programs decays rapidly over time (Fernandes et al., 2014). These findings highlight the importance of also targeting financial experience to promote exposure to tasks that will allow for the continuation of informed financial decision making.

Given that financial literacy often includes skills associated with fluid abilities which tend to decline beginning in young adulthood (Salthouse, 2004), financial experience is a key area for interventions to focus on. Experience-based knowledge, a form of crystallized cognitive ability that tends to accumulate throughout adulthood (Salthouse, 2004), may help compensate for age-related cognitive decline in fluid cognition associated with financial tasks (Li et al., 2013; 2015). Interventions should focus on the strengths of their audience. Older adults tend to have lower analytic functioning and higher levels of experience compared to younger adults (Agarwal et al., 2009). Therefore, interventions aimed towards older adults could emphasize the role of

experience with financial tasks rather than only focusing on analytical cognitive abilities. Building upon older adults' experience may also enhance levels of financial literacy.

Also, some decisions may not be encountered until later life, such as those surrounding retirement planning. These decisions often do not provide people with the chance to gain experience to make informed decisions. Future research should continue to explore the ways in which financial literacy and experience each uniquely affect financial decisions, particularly decisions in which the adverse effects of cognitive aging may inhibit the advantageous effects of experience (Li et al., 2013).

Preferences for sequences of paying money. Greater financial literacy was significantly associated with preferences for sequences of paying larger amounts of money sooner than later, both before and after controlling for financial experience. These findings conflict with normative economic principles of maximizing the value of available funds (Loewenstein & Sicherman, 1991). Typically, monetary payments include interest rates. Decisions to pay larger amounts sooner than smaller amounts are normatively correct in those situations. The vignettes in the present study did not explicitly state that there was no accrued interest, but did state that the amount of money paid would be the same irrespective of how the payments were sequenced. Participants with greater financial literacy or financial experience may have had difficulty overriding their knowledge related to accrued interest (Korniotis & Kumar, 2011).

Greater financial experience was also significantly associated with non-normatively correct preferences to pay larger amounts of money sooner than later, although this association was no longer significant after controlling for financial literacy. Greater experience with financial tasks, such as those involving interest rates, may have influenced participants' preferences for paying larger amounts of money sooner. Although older age was associated with

greater financial experience, when older adults encounter a new financial decision for the first time, they may struggle to a similar degree as younger adults (Eberhardt et al., 2018).

There was also a suppressor effect, where controlling for the path through financial literacy amplified the association between age and preferences for sequences to pay money, such that older age was associated with preferences to pay smaller amounts of money sooner than larger amounts after taking into account older adults' greater financial literacy. These results further show how those with greater financial literacy may have had difficulty overriding their knowledge related to basic economic concepts about payments with accrued interest. Research has shown that these types of extrapolations are common when people use logical reasoning (Wong, Kwong, & Ng, 2008), which may include the application of economic principles when making financial decisions. There was not a significant indirect path of domain-specific financial experience, which is similar to previous findings with domain-general experience (Strough et al., 2018). Taken together, these findings highlight how decision processes associated with paying money differ from those related to receiving money.

Limitations

The present study should be considered in light of its limitations. First, this was a cross-sectional design with correlational methods, as opposed to a longitudinal design. Therefore, conclusions about older age being related to greater financial literacy and financial experience, and normatively correct decisions for receiving money, may not be developmental per se, but rather reflect cohort differences. Moreover, some cohorts have experienced two stock market crashes. Research has shown that older adults who lose their jobs spend more time unemployed compared to younger adults, which can lead to using retirement savings prematurely (Johnson, 2012). Thus, experience with stock market crashes may have affected some participants'

sequence preferences. Additionally, since the vignettes had a timeline of five years, some participants may have considered their current tax bracket versus their future tax bracket for decisions to receive money. While these domain-specific financial variables appear to be important in explaining age differences in preferences for sequences of receiving money, longitudinal studies that examine developmental change over time may identify other explanations (Lindenberger et al., 2011). Second, this study employed hypothetical vignettes to assess financial decision making, which may not correspond to financial decisions people make in their everyday lives. However, research suggests that real-world decision behaviors can be predicted by decisions about hypothetical scenarios (Bruine de Bruin et al., 2007). Future research could incorporate scenarios with real money earnings and losses, similar to Löckenhoff and colleagues who did not find age differences (2017). Third, the older adults in this sample were recruited from MTurk, a crowd sourcing site, which suggests that they may be more tech savvy than the general older adult population. One study on older adults (60+) showed that only 77 of 505 participants had heard of crowd work (Brewer, Moris, & Piper, 2016). Further, the majority of older adults in this study were between 60-65 years of age. Future work should aim to include more participants of the “oldest old” (age 80 and older), although the use of MTurk may limit this sample due to lower levels of Internet skills (Hargittai & Dobransky, 2017).

Conclusion

In conclusion, as the population age continues to increase (He et al., 2015), understanding how financial decision making changes across adulthood is critical. The current findings contribute new knowledge to the growing field of aging and financial decision making, and have significant implications for promoting better decision making. Results suggest that financial literacy and financial experience each have unique properties, and that interventions could target

both financial literacy and financial experience to facilitate and promote financial decision making across adulthood.

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Table 1.
Sample Characteristics and Key Study Variables (N = 594)

Measure	<i>M</i> (<i>n</i>)	<i>SD</i> (%)	α
Receiving Money	3.18	1.49	0.83
Paying Money	2.65	1.37	0.83
Financial Literacy	0.61	0.24	0.80
Financial Experience	4.16	0.64	0.88
Age	46.48	15.16	-
Gender			
Female	321	(54.0)	-
Male	273	(46.0)	-
Ethnicity			
White	498	(83.8)	-
Black	32	(5.4)	-
Latino(a)	26	(4.4)	-
Asian	22	(3.7)	-
Native Am.	8	(1.3)	-
Other	6	(1.0)	-
Not Reported	2	(0.3)	-
Income			
< \$20,000	89	(15.0)	-
\$20,000-\$39,000	144	(24.2)	-
\$40,000-\$59,000	108	(18.2)	-
\$60,000-\$79,000	112	(18.9)	-
\$80,000-\$99,000	53	(8.9)	-
>\$100,000	88	(14.8)	-
Education			
Some High School	2	(0.3)	-
High School Grad	70	(11.8)	-
Vocational Training	13	(2.2)	-
Some College	130	(21.9)	-
Associate Degree	84	(14.1)	-
Bachelor's Degree	204	(34.3)	-
Some Grad School	13	(2.2)	-
Master's Degree	59	(9.9)	-
Ph.D./Professional	19	(3.2)	-
Employment Status			
Employed Full Time	315	(53.0)	-
Employed Part-Time	86	(14.5)	-
Not Employed, Looking for Work	36	(6.1)	-
Not Employed, Not Looking for Work	37	(6.2)	-
Retired	83	(14.0)	-

Other	34	(5.7)	-
Area of Residence			
Rural	75	(12.6)	-
Small town	119	(20.0)	-
Suburban	211	(35.5)	-
Small city	57	(9.6)	-
Medium city	48	(8.1)	-
Large city	81	(13.6)	-
Not Reported	3	(0.5)	-
Marital Status			
Single	211	(35.5)	-
Married	292	(49.2)	-
Separated	8	(1.3)	-
Divorced	65	(10.9)	-
Widowed	18	(3.0)	-

Table 2. *Bivariate Correlations among Key Variables*

	1	2	3	4	5
1. Age	-	-	-	.04	.25**
2. Receiving Money	-.14**	-	-	-.08*	-.10*
3. Paying Money	.03	.03	-	-.13**	-.03
4. Financial Literacy	.18***	-.16***	-.16***	-	-
5. Financial Experience	.30***	-.17***	-.11**	.51***	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Zero order correlations are below the diagonal line. Partial correlations are above the diagonal line. Financial literacy correlations above the line control for financial experience. Financial experience correlations above the line control for financial literacy.

Table 3. *Independent Samples t-tests for Financial Literacy and Experience*

Demographic	Financial Literacy	Financial Experience	Group Comparison
Gender			
Females	0.58 (0.23)	4.10 (0.57)	$t(592) = 3.64^{***}$
Males	0.65 (0.25)	4.24 (0.70)	$t(524.05) = 2.49^*$
Race/Ethnicity			
Non-White	0.50 (0.25)	3.96 (0.62)	$t(592) = -5.23^{***}$
White	0.64 (0.23)	4.20 (0.64)	$t(592) = -3.46^{**}$
Educational Attainment			
Less than Bachelor's Degree	0.56 (0.25)	3.02 (0.64)	$t(592) = -5.87^{***}$
Bachelor's Degree or more	0.67 (0.22)	4.31 (0.61)	$t(592) = -5.79^{***}$
Employment Status			
Other	0.61 (0.25)	4.10 (0.63)	$t(592) = -0.47$
Full-time	0.62 (0.23)	4.22 (0.64)	$t(592) = -2.24^*$
Marital Status			
Other	0.60 (0.25)	4.05 (0.65)	$t(588.72) = -1.41$
Married	0.63 (0.23)	4.28 (0.61)	$t(592) = -4.52^{***}$
Income			
Less than \$40K	0.57 (0.26)	3.96 (0.63)	$t(450.63) = -3.13^*$
More than \$40K	0.64 (0.23)	4.30 (0.64)	$t(592) = -6.50^{***}$

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

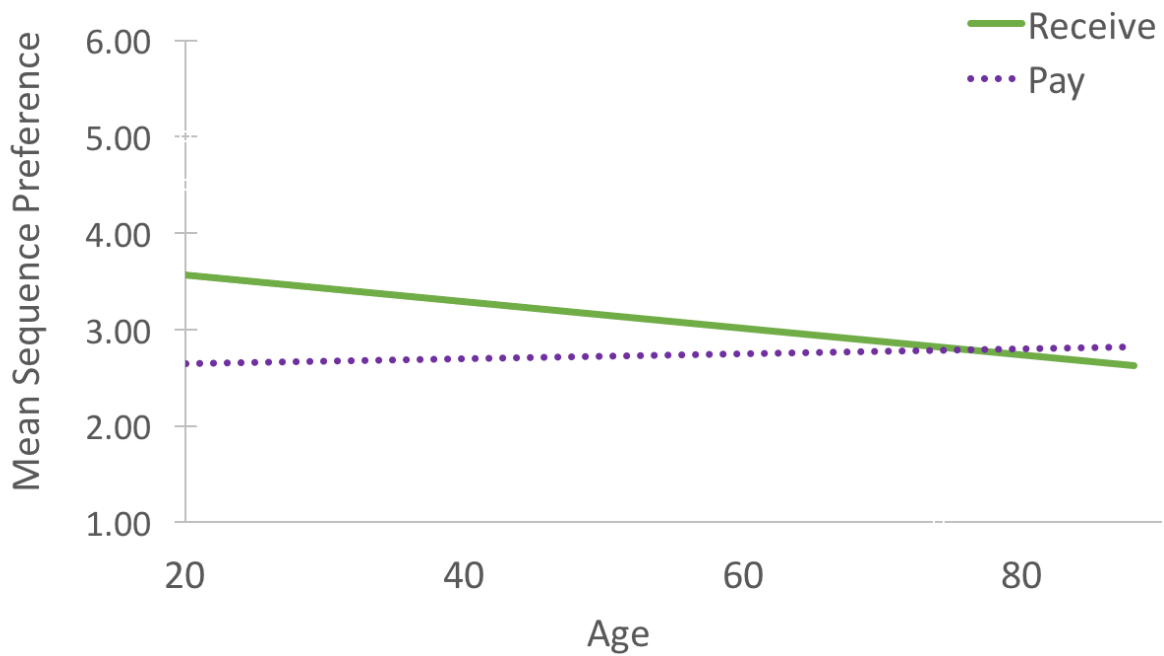
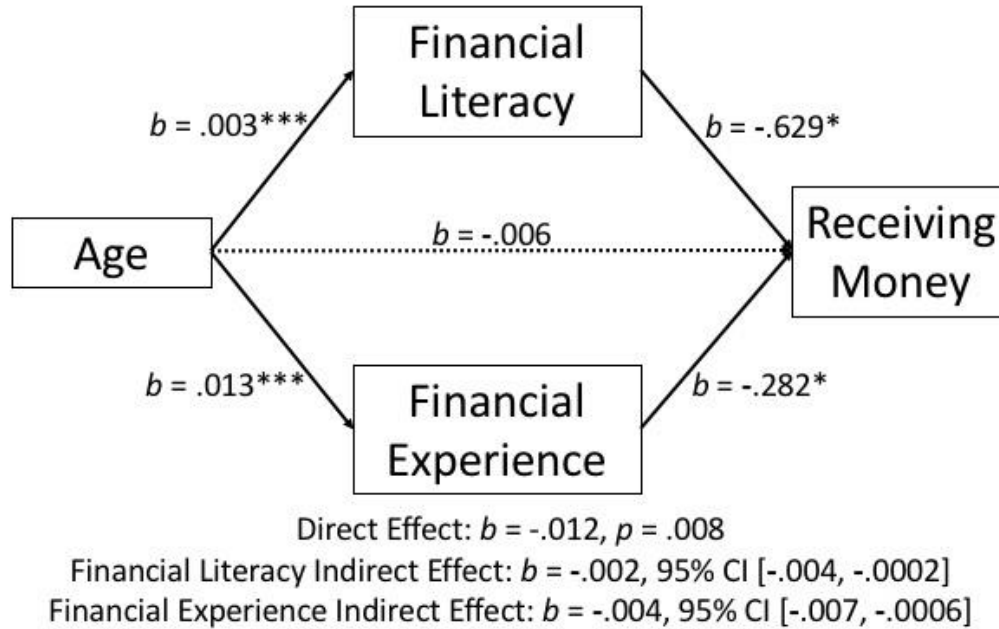


Figure 1. Age differences in sequence preferences by receiving versus paying money

Note. Lower scores indicated preferences for larger sooner than smaller, and higher scores indicated smaller sooner than larger. For preferences to receive money, lower scores indicated normatively correct choices to maximize current value of funds. For paying money, higher scores indicated normatively correct choices. Gender was included as a covariate.

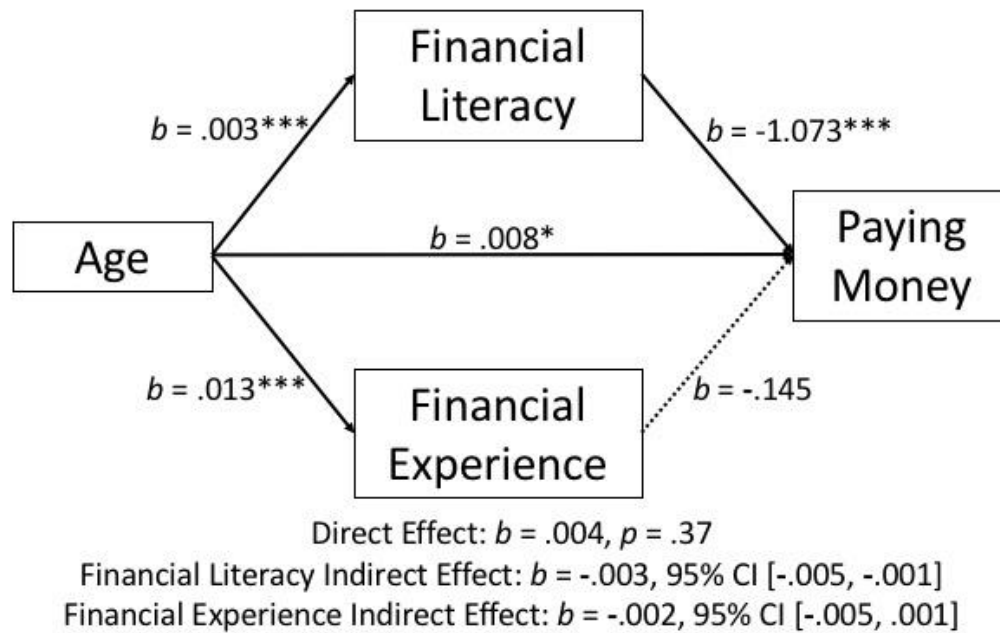
Figure 2. Direct association between age and preferences for receiving money, and indirect associations through financial literacy and financial experience.



* $p < .05$, ** $p < .01$, *** $p < .001$

Note. All coefficients are unstandardized bootstrapped effects. For age, higher values indicated older age. Greater financial literacy and financial experience were indicated by higher values. Normatively correct preferences for receiving money was shown in *lower* scores. Solid lines represent significant indirect effects. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates.

Figure 3. Direct association between age and preferences for paying money, and indirect associations through financial literacy and financial experience.



* $p = .05$, ** $p < .01$, *** $p < .001$

Note. All coefficients are unstandardized bootstrapped effects. For age, higher values indicated older age. Greater financial literacy and financial experience were indicated by higher values. Normatively correct preferences for paying money was shown in *higher* scores. Solid lines represent significant indirect effects. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates.

Appendix A

Intertemporal Sequences

(Items 1 and 5 are from Strough, Bruine de Bruine, and Parker, 2018; items 2 and 3 are from Loewenstein and Sicherman, 1991)

Instructions: For the following scenario, please indicate the response on the scale that best reflects your preference.

How would you prefer to receive the money?

1	2	3	4	5	6
Start with larger amounts first end with smaller					Start with smaller amounts first, end with larger

1) Inheritance income/Monetary Gains

Imagine you just found out that that you will receive a very large monetary inheritance from a relative that you didn't even know you had. You will be given the money in multiple installments over time. There are different ways that you can receive the money. One way would be to receive larger amounts of money early and smaller amounts of money later. Another way would be to receive smaller amounts of money early and larger amounts of money later. In all cases, the total amount of money would be the same.

How would you prefer to receive the money?

2) Wage Progression/ Monetary Gains

Imagine that you are not working now, but have been offered a five year job. You are presented with a choice of contracts with different payment options. Assume you are certain that you will work at this job during the next five years and that the payment option you select will not affect future jobs in any way. The wages from this job will be your only source of income over the next five years.

How would you prefer to receive the money?

3) Rental Income/Monetary Gains

Image that you are not working now and your only source of income is a small apartment building that you recently inherited. You have agreed to lease the building to a real estate broker for the next five years. The broker has offered you contracts with different payment options. Assume that these payments will be your only source of income during the next five years.

How would you prefer to receive the money?

4) Lottery income/Monetary Gains

Imagine that you won the lottery and you are not currently working. You won so much money that you plan to use the money as your only source of income for the next five years. You have different options for receiving the money you won.

How would you prefer to receive the money?

5) Money owed/ Monetary Losses

Imagine that you owe a very large amount of money. You will have to pay out the money in multiple installments over time. There are different ways that you could make the payments. One way would be to pay larger amounts of money early and to pay smaller amounts of money later. Another way would be to pay smaller amounts of money early and to pay larger amounts of money later. In all cases, the total amount of money would be the same. How would you prefer to pay the money?

6) Mortgage Payment/Monetary Losses

Imagine that you are buying a house. You are presented with a choice of mortgages with different options for making house payments. Assume you will live in the house for at least the next five years and you will not refinance the house or change any of the other conditions of your mortgage.

How would you prefer to pay the money?

7) Car Payments/Monetary Losses

Imagine that you are buying a car. You are presented with a choice of loans with different options for making car payments. Assume you will be driving the car and making payments for the next five years. During the five years, you will not sell the car or give it away; the car will not be damaged in an accident.

How would you prefer to pay the money?

8) Loan Payments/Monetary Losses

Imagine that you are consolidating all of your credit-card debt into a single loan and you are presented with a choice of loans with different options for making payments. Assume that you will be paying on the loan for the next five years. During the five years you will not consolidate this debt again or change any of the conditions of the loan.

How would you prefer to pay the money?

Appendix B

Financial Literacy

(Compilation of 13 items from Fernandes, Lynch, & Netemeyer, 2014; items 1 and 2 from Lusardi and Mitchell (2011); items 3, 4, 5, 10, 11, and 12 from van Rooij, Lusardi, and Alessie (2011); item 6 from Agnew and Szykman (2005); items 7 and 8 from Hung, Meijer, Mihaly, and Yoong (2009); item 9 from Lusardi (2010); and item 13 from Lusardi and Tufano (2009)).

Instructions: Please respond honestly to the following set of questions.

Correct responses in italics

- 1) Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy:
 - More than today with the money in this account
 - Exactly the same as today with the money in this account
 - *Less than today with the money in this account*
 - Don't know
 - Refuse to answer
- 2) Do you think that the following statement is true or false? "Bonds are normally riskier than stocks."
 - True
 - *False*
 - Don't know
 - Refuse to answer
- 3) Considering a long time period (for example, 10 or 20 years), which asset described below normally gives the highest return?
 - Savings accounts
 - *Stocks*
 - Bonds
 - Don't know
 - Refuse to answer
- 4) Normally, which asset described below displays the highest fluctuations over time?
 - Savings accounts
 - *Stocks*
 - Bonds
 - Don't know
 - Refuse to answer
- 5) When an investor spreads his money among different assets, does the risk of losing a lot of money:
 - Increase
 - *Decrease*
 - Stay the same

- Don't know
 - Refuse to answer
- 6) Do you think that the following statement is true or false? "If you were to invest \$1,000 in a stock mutual fund, it would be possible to have less than \$1,000 when you withdraw your money."
- *True*
 - False
 - Don't know
 - Refuse to answer
- 7) Do you think that the following statement is true or false? "A stock mutual fund combines the money of many investors to buy a variety of stocks."
- *True*
 - False
 - Don't know
 - Refuse to answer
- 8) Do you think that the following statement is true or false? "After age 70 1/2, you have to withdraw at least some money from your 401(k) plan or IRA."
- *True*
 - False
 - It depends on the type of IRA and/or 401(k) plan
 - Don't know
 - Refuse to answer
- 9) Do you think that the following statement is true or false? "A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less."
- *True*
 - False
 - Don't know
 - Refuse to answer
- 10) Suppose you have \$100 in a savings account and the interest rate is 20% per year and you never with- draw money or interest payments. After 5 years, how much would you have in this account in total?
- *More than \$200*
 - Exactly \$200
 - Less than \$200
 - Don't know
 - Refuse to answer
- 11) Which of the following statements is correct?
- Once one invests in a mutual fund, one cannot with-draw the money in the first year
 - *Mutual funds can invest in several assets, for example invest in both stocks and bonds*
 - Mutual funds pay a guaranteed rate of return which depends on their past performance
 - None of the above

- Don't know
 - Refuse to answer
- 12) Which of the following statements is correct? If somebody buys a bond of firm B:
- He owns a part of firm B
 - *He has lent money to firm B*
 - He is liable for firm B's debts
 - None of the above
 - Don't know
 - Refuse to answer
- 13) Suppose you owe \$3,000 on your credit card. You pay a minimum payment of \$30 each month. At an annual percentage rate of 12% (or 1% per month), how many years would it take to eliminate your credit card debt if you made no additional new charges?
- Less than 5 years
 - Between 5 and 10 years
 - Between 10 and 15 years
 - *Never*
 - Don't know
 - Refuse to answer

Appendix C

Financial Experience
(Li, Gao, Enkavi, Zaval, Weber, & Johnson, 2015)

Instructions: How experienced are you with the following types of financial products or services?

- 1 = Never Heard of it
- 2 = Heard of it, but not sure what it is
- 3 = Have some idea of what it is, but no actual experience.
- 4 = Have some idea of what it is and indirect experience (e.g., through family or friends)
- 5 = Have personal experience with it
- 6 = Have a lot of personal experience with it

- 1) Savings account
- 2) Checking account
- 3) Money market account
- 4) Certificate of deposit
- 5) 401(k), 403(B), or 457 (b) plans
- 6) IRA plan
- 7) Bonds
- 8) Stock
- 9) Mutual Fund
- 10) Exchange-traded Fund
- 11) Variable Annuity
- 12) Fixed Annuity
- 13) Credit Card
- 14) Debit Card
- 15) Mortgage
- 16) 2nd Mortgage or Home-equity Line of Credit
- 17) Auto Loan
- 18) Student Loan
- 19) Payday Loan
- 20) Car Title Loan

Appendix D

Demographic Questionnaire

What is your gender?

- Woman
- Man
- Transgender woman
- Transgender man
- Other _____

What is your age in years?

What is your marital status?

- Single
- Married
- Separated
- Divorced
- Widowed

What is your race/ethnicity? (check all that apply)

- White/Caucasian
- Hispanic/Latino(a)
- African-American/Black
- Asian
- Native American
- Other- please list: _____

What is your highest level of education?

- Did not receive high school diploma or GED
- High school diploma or GED
- Vocational training (e.g. electrician, plumber, mechanic, beautician, L.P.N., etc.)
- Some college (but no degree)
- Associate's degrees or equivalent (2-year degree)
- Bachelor of arts (B.A.) or bachelor of science (B.S.) degree
- Some graduate work (but degree not completed)
- Master's degree (e.g., M.A., M.S., M.S.W., M.B.A., M.L.S., etc.)

- Completion of a Ph.D. or professional degree requiring at least 3 years of full-time graduate work (e.g., M.D., O.D., D.D.S., J.D., L.L.D.)
- Other: ____

What is your current employment status?

- Employed full time
- Employed part-time
- Not employed and looking for work
- Not employed and not seeking work
- Retired
- Other (please specify) _____

What is your household income?

- 0-\$19,999
- \$20,000-\$39,999
- \$40,000-\$59,999
- \$60,000-\$79,999
- \$80,000-\$99,999
- \$100,000-\$119,999
- \$120,000-\$139,999
- \$140,000 or more

How would you characterize your hometown (where you currently live)?

- Rural (unincorporated)
- Small town (village or town)
- Suburban (metropolitan area of a large city)
- Small city (population < 30,000)
- Medium-sized city (population 30,000 - 100,000)
- Large city (population > 100,000)

Appendix E

Exploratory Mediation Models

Age and Preferences for Sequences for Receiving Money**Simple Mediation Models**

Financial literacy. To determine whether financial literacy statistically accounted for older adults' preferences to receive larger amounts of money sooner than smaller amounts, a mediation model using Hayes' (2017) bootstrapping procedure with 5,000 resamples was used. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 23.8% of the variance in preferences for sequences to receive money, $F(8, 585) = 4.40, p < .001$. There was a significant indirect effect of age on preferences for sequences of receiving money through financial literacy ($b = -.002, 95\% \text{ CI } [-.005, -.001]$). After including the significant indirect path through financial literacy, the direct effect ($b = -.012, p = .008$) of age on preferences for sequence of receiving money was reduced ($b = -.009, p = .03$)⁶. Therefore, older adults' greater financial literacy partially accounted for their normatively correct preferences for sequences to receive money.

Financial experience. To determine whether financial experience statistically accounted for older adults' preferences to receive larger amounts of money sooner than smaller amounts, a mediation model using Hayes' (2017) bootstrapping procedure with 5,000 resamples was used. Participant gender, race/ethnicity, education, income, employment, and marital status were

⁶ The pattern of results remained the same when demographic characteristics were not included as covariates. However, the indirect path was no longer significant when controlling for both demographic characteristics and financial experience. The indirect path through financial literacy was also no longer significant when controlling for only financial experience.

entered as covariates. The overall model explained 24.3% of the variance in preferences for sequences to receive money, $F(8, 585) = 4.58, p < .001$. There was a significant indirect effect of age on preferences for sequences of receiving money through financial experience ($b = -.005$, 95% CI $[-.008, -.002]$). After including the significant indirect path through financial experience, the direct effect ($b = -.012, p = .008$) of age on preferences for sequences of receiving money was no longer significant ($b = -.006, p = .16$)⁷. Therefore, older adults' greater financial experience accounted for their normatively correct preferences for sequences to receive money.

Serial Mediation Models

Financial literacy leading to greater financial experience. Next, the following directional chain was tested: age → financial literacy → financial experience → preferences for sequences of receiving money. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 25.8% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.61, p < .001$. There was a direct effect of age on preferences for sequences of receiving money ($b = -0.012, p = .008$), which was no longer significant when both financial literacy and experience were included in the model ($b = -0.006, p = .17$). The indirect effect was significant ($b = -0.008, CI 95\% [-.002, -.0002]$)⁸. An examination of the coefficients revealed that age was related to greater financial literacy, greater financial literacy was related to greater financial experience, and greater financial experience was related to preferences to receive money larger amounts of money

⁷ Pattern of results remained the same when demographic characteristics were not included as covariates. When controlling for both demographic characteristics and financial literacy, the pattern of results remained the same. However, the indirect path through financial experience was no longer significant when controlling for only financial literacy and not demographics.

⁸ When demographic characteristics were not controlled for, the indirect effect was not significant.

sooner than larger. In other words, older adults had greater financial literacy, those with greater financial literacy had greater financial experience, and greater financial experience was related to normatively correct preferences for sequences to receiving money.

Financial experience leading to greater financial literacy. Next, the following directional chain was tested: age → financial experience → financial literacy → preferences for sequences of receiving money. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 25.8% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.61, p < .001$. There was a direct effect of age on preferences for sequences of receiving money ($b = -0.012, p = .008$), which was no longer significant when both financial experience and literacy were included in the model ($b = -0.006, p = .76$). The indirect effect was significant ($b = -0.001, CI\ 95\% [-.003, -.0002]$)⁹. An examination of the coefficients revealed that age was related to greater financial experience, greater financial experience was related to greater financial literacy, and greater financial literacy was related to preferences for sequences to receive larger amounts of money sooner than later. In other words, older adults had greater financial experience, those with greater financial experience had greater financial literacy, and greater financial literacy was related to normatively correct preferences for sequences of receiving money.

Moderated Mediation Models

Using model 8 on the PROCESS macro for SPSS, a moderated mediation was conducted to test whether the indirect effect of age on preferences for sequences of receiving money through financial literacy was moderated by financial experience. Participant gender,

⁹ When demographic characteristics were not controlled for, the pattern of results remained the same.

race/ethnicity, education, income, employment, and marital status were entered as covariates. No significant moderated mediation was found¹⁰.

Additionally, a moderated mediation was conducted to test whether the indirect effect of age on preferences for sequences of receiving money through financial experience was moderated by financial literacy. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. No significant moderated mediation was found¹¹.

Age and Preferences for Sequences of Paying Money

Simple Mediation Models

Financial literacy. The indirect effect of age on preferences for sequences to pay money through financial literacy was examined. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 25.4% of the variance in preferences for sequences to receive money, $F(8, 585) = 5.03, p < .001$. There was a significant indirect effect of age on preferences for sequences of paying money through financial literacy ($b = -.003, 95\% \text{ CI } [-.006, -.001]$). After including the significant indirect path through financial literacy, the direct effect ($b = .004, p = .37$) of age on preferences for sequences of paying money was *stronger* than when not taking the path into account ($b = .007, p = .09$)¹².

That is, there was a suppressor effect, where controlling for the path through financial literacy

¹⁰ Pattern of results was similar when demographic characteristics were not included as covariates.

¹¹ Pattern of results was similar when demographic characteristics were not included as covariates.

¹² The pattern of results remained the same when demographic characteristics were not included as covariates. However, the indirect path was no longer significant when controlling for both demographic characteristics and financial experience. The indirect path through financial literacy was also no longer significant when controlling for only financial experience.

amplified the association between age and preferences for sequences to pay money. Hence, older age was associated with reporting preferences to pay smaller amounts of money sooner than larger amounts when accounting for older adults' greater financial literacy. This is the normatively correct decision.

Financial experience. The indirect effect of age on preferences for sequences to pay money through financial experience was examined. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 20.6% of the variance in preferences for sequences to receive money, $F(8, 585) = 3.25, p = .001$. There was a significant indirect effect of age on preferences for sequences of paying money through financial experience ($b = -.004, 95\% \text{ CI } [-.007, -.002]$). After including the significant indirect path through financial experience, the direct effect ($b = .004, p = .37$) of age on preferences for sequences of paying money was *stronger* than when not taking the path into account ($b = .008, p = .06$)¹³. That is, there was a suppressor effect, where controlling for the path through financial experience amplified the association between age and preferences for sequences to pay money. Hence, older age was associated with reporting preferences to pay smaller amounts of money sooner than larger amounts when accounting for older adults' greater financial experience. This is the normatively correct decision.

Serial Mediation Models

Financial literacy leading to greater financial experience. The following directional chain: age -> financial literacy -> financial experience -> preferences for sequences of paying

¹³ The pattern of results remained the same when demographic characteristics were not included as covariates. However, the indirect path was no longer significant when controlling for both demographic characteristics and financial literacy. The indirect path through financial experience was also no longer significant when controlling for only financial literacy.

money. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 25.9% of the variance in preferences for sequences to pay money, $F(9, 584) = 4.66, p < .001$. After including the significant indirect path through financial literacy and experience, the direct effect ($b = .004, p = .37$) of age on preferences for sequence of paying money was *stronger* than when not taking the path into account ($b = .008, p = .05$). The indirect effect was not significant ($b = -0.004, CI\ 95\% [-.001, .0001]$)¹⁴.

Financial experience leading to greater financial literacy. Next, the following directional chain was tested: age → financial experience → financial literacy → preferences for sequence of paying money. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 25.9% of the variance in preferences for sequences to pay money, $F(9, 584) = 4.66, p < .001$. After including the significant indirect path through financial experience and literacy, the direct effect ($b = .004, p = .37$) of age on preferences for sequences of paying money was *stronger* than when not taking the path into account ($b = .008, p = .05$). The indirect effect was significant ($b = -0.002, CI\ 95\% [-.004, -.001]$)¹⁵. An examination of the coefficients revealed that age was related to greater financial experience, greater financial experience was related to greater financial literacy, and greater financial literacy was related to preferences to pay larger amounts of money sooner than later. In other words, older adults had greater financial experience, those with greater financial

¹⁴ When demographic characteristics were not controlled for, the pattern of results remained the same.

¹⁵ When demographic characteristics were not controlled for, pattern of results remained the same.

experience had greater financial literacy, and greater financial literacy was related to preferences to non-optimal preferences for sequences of paying money.

Moderated Mediation Models

Using model 8 on the PROCESS macro for SPSS, a moderated mediation was conducted to test whether the indirect effect of age on preferences for sequence to pay money through financial literacy was moderated by financial experience. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. No significant moderated mediation was found¹⁶.

Additionally, a moderated mediation was conducted to test whether the indirect effect of age on preferences for sequences to pay money through financial experience was moderated by financial literacy. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. No significant moderated mediation was found¹⁷.

Age and Financial Literacy

Simple Mediation Model

Research that has posited that older adult's accrued life experience with financial tasks may account for greater financial literacy in old age (see Hershey et al., 2015 for a review). To determine whether financial experience statistically accounted for older adults' greater financial literacy, a mediation model using Hayes' (2017) bootstrapping procedure with 5,000 resamples was used. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. The overall model explained 55.2% of the variance, $F(8, 585) =$

¹⁶ Pattern of results was similar when demographic characteristics were not included as covariates.

¹⁷ Pattern of results was similar when demographic characteristics were not included as covariates.

32.09, $p < .001$. There was a significant indirect effect of age on financial literacy through financial experience ($b = .002$, 95% CI [.002, .003]). After including the significant indirect path through financial experience, the direct effect ($b = .003$, $p = .0002$) of age on financial literacy was no longer significant ($b = .0002$, $p = .74$)¹⁸. Therefore, older adults' greater financial experience accounted for their greater financial literacy.

¹⁸ The pattern of results remained the same when demographic characteristics were not included as covariates.

Appendix F

Principal Components Analysis of Financial Experience

Dimensional Structure of Financial Experience

To explore if the measure of financial experience was composed of distinct dimensions, a Principal Components Analyses (PCA) with varimax rotation was performed. First, a PCA was conducted on the full 20-item measure. The scree-plot and eigenvalues were examined to determine the ideal number of components. Subsequently, additional PCA's were run after removing cross-loaded items. For each PCA, the scree plot and eigenvalues were examined to determine the ideal number of components.

One cross-loaded item and one item that did not load on any of the factors were removed after the first PCA. See Table 3 for a description of these analyses. The final PCA was run on the remaining 18 items. An examination of the scree-plot and eigenvalues with the remaining items indicated a three-component solution, which accounted for 55.60% of the variance. In Table 3, extracts of varimax-rotated component loadings are listed. The first component (31.75% variance accounted for after varimax rotation) appeared to represent *advanced experience* and included the following items: money market account, IRA plan, bonds, mutual fund, variable annuity, fixed annuity, stock, certificate of deposit, and exchange-traded fund. The second component (16.66% variance accounted for) seemed to reflect *common experience* and included the following items: savings account, checking account, credit card, debit card, mortgage, auto loan, student loan. The third factor (8.81% variance accounted for) appeared to represent *costly experience* and included two items: payday loan and car title loan.

Financial Experience Items	Factor Loadings		
	Advanced	Common	Costly
Experience with...			
Savings account		.734	
Checking account		.821	
Money market account	.751		
Certificate of deposit	.669		
401(k), 403(B), or 457 (b) plans*	.562	.495	
IRA plans	.700		
Bonds	.674		
Stock	.700		
Mutual fund	.796		
Exchange-traded fund	.736		
Variable annuity	.717		
Fixed annuity	.706		
Credit card		.790	
Debit card		.776	
Mortgage		.564	
2 nd Mortgage or home-equity line of credit**	.387		.340
Auto loan		.650	
Student loan		.432	
Payday loan			.836
Car title loan			.821

Table 3. *Principal Components Analysis of Financial Experience Items*

Note. * = item that cross loaded and was dropped from the second PCA. ** = item that did not load highly on any factor and was dropped from the second PCA.

Appendix G

Correlations between Key Study Variables and Three Types of Financial Experience

To examine if age was associated with the three dimensions of financial experience, bivariate correlations were conducted. Older age was associated with greater advanced experience ($r = .28, p < .001$) and greater common experience ($r = .18, p < .001$). Age was not associated with costly experience ($r = .02, p = .71$).

	1	2	3	4	5	6	7
1. Age	-						
2. Receiving Money	-.14***	-					
3. Paying Money	.03	.03	-				
4. Financial Literacy	.18***	-.16**	-.16***	-			
5. Common Financial Experience	.18**	-.14**	-.18***	.41***	-		
6. Advanced Financial Experience	.28***	-.12**	-.04	.46***	.31***	-	
7. Costly Financial Experience	.02	-.10*	.02	.03	.12**	.19***	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix H

Mediation Models for Each Type of Financial Experience

The PCA of financial experience indicated that the measure was composed of three dimensions. Thus, three new variables were computed: 1) common experience ($\alpha = .80$), 2) advanced experience ($\alpha = .89$), and 3) costly experience ($\alpha = .67$). Variables were computed by averaging appropriate items across each of the dimensions. Higher scores indicated greater financial experience on that dimension.

Common Financial Experience

To determine whether financial literacy and common financial experience statistically accounted for age-related variance in preferences for sequences to receive and pay money, two parallel mediations were conducted. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates.

The overall model explained 24.7% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.22, p < .001$. There was a significant indirect effect of age on preferences for sequences to receive money through financial literacy ($b = -.002, 95\% \text{ CI } [-.004, -.0006], p = .01$), but not through common financial experience ($b = -.001, 95\% \text{ CI } [-.003, .0001], p = .10$). After including the significant indirect path through financial literacy, the direct effect ($b = -.011, p = .008$) of age on preferences for sequences to receive money was marginally significant ($b = -.01, p = .05$). This indicated that older adults' normatively correct preferences for sequences for receiving larger amounts of money sooner than later was partially accounted for by greater financial literacy.

Next, indirect effects of age on preferences for sequences to pay money were examined. The overall model explained 27.3% of the variance in preferences for sequences to receive money, $F(9, 584) = 5.23, p < .001$. There were significant indirect effects of age on preferences for sequences to pay money through financial literacy ($b = -.002, 95\% \text{ CI } [-.005, -.001], p < .001$) and common financial experience ($b = -.002, 95\% \text{ CI } [-.004, -.0004], p = .01$).¹¹ After including the two significant indirect paths, the direct effect of age on preferences for sequences to pay money ($b = .004, p = .37$) was even *stronger* than when not taking the paths into account ($b = .008, p = .05$). That is, there was a suppressor effect, where controlling for the paths through financial literacy and common financial experience amplified the positive association between age and preferences for sequences to pay money. Hence, older age was associated with reporting preferences to pay smaller amounts of money sooner than larger amounts when accounting for older adults' greater financial literacy and common financial experience.

Advanced Financial Experience

To determine whether financial literacy and advanced financial experience statistically accounted for age-related variance in preferences for sequences to receive and pay money, two parallel mediations were conducted. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates.

The overall model explained 24.6% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.17, p < .001$. There was a significant indirect effect of age on preferences for sequences to receive money through financial literacy ($b = -.002, 95\% \text{ CI } [-.004, -.0006], p = .01$), but not through advanced financial experience ($b = -.002, 95\% \text{ CI } [-.005, .0006], p = .14$). After including the significant indirect path through financial literacy, the direct effect ($b = -.012, p = .008$) of age on preferences for sequences to receive money was marginally

significant ($b = -.01, p = .09$). This indicated that older adults' normatively correct preferences for receiving larger amounts of money sooner than later was partially accounted for by their greater financial literacy.

Next, indirect effects of age on preferences for sequences to pay money were examined. The overall model explained 25.4% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.47, p < .001$. There were significant indirect effects of age on preferences for sequences to pay money through financial literacy ($b = -.003, 95\% \text{ CI } [-.006, -.001], p < .001$), but not advanced financial experience ($b = -.0002, 95\% \text{ CI } [-.003, .002], p = .86$). After including the one significant indirect path, the direct effect of older age on preferences for sequences to pay money ($b = .004, p = .37$) was even *stronger* than when not taking the paths into account ($b = .007, p = .10$). That is, there was a suppressor effect, where controlling for the path through financial literacy amplified the positive association between age and preferences for sequences to pay money. Hence, older age was associated with reporting preferences to pay smaller amounts of money sooner than larger amounts when accounting for older adults' greater financial literacy.

Costly Financial Experience

To determine whether financial literacy and costly financial experience statistically accounted for age-related variance in preferences for sequences to receive and pay money, two parallel mediations were conducted. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates.

The overall model explained 25.6% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.56, p < .001$. There was a significant indirect effect of age on preferences for sequences to receive money through financial literacy ($b = -.002, 95\% \text{ CI } [-.005,$

-.001], $p < .001$), but not through advanced financial experience ($b = -.001$, 95% CI [-.002, .0001], $p = .02$). After including the significant indirect path through financial literacy, the direct effect ($b = -.012$, $p = .008$) of age on preferences for sequences to receive money was marginally significant ($b = -.01$, $p = .04$). This indicated that older adults' normatively correct preferences for receiving larger amounts of money sooner than later was partially accounted for by greater financial literacy.

Next, indirect effects of age on preferences for sequences to pay money were examined. The overall model explained 25.5% of the variance in preferences for sequences to receive money, $F(9, 584) = 4.49$, $p < .001$. There were significant indirect effects of age on preferences for sequences to pay money through financial literacy ($b = -.003$, 95% CI [-.006, -.001], $p < .001$), but not costly financial experience ($b = .0001$, 95% CI [-.0002, .001], $p = .64$). After including the one significant indirect path, the direct effect of older age on preferences for sequences to pay money ($b = .004$, $p = .37$) was even *stronger* than when not taking the paths into account ($b = .007$, $p = .10$). That is, there was a suppressor effect, where controlling for the path through financial literacy amplified the positive association between age and preferences for sequences to pay money. Hence, older age was associated with reporting preferences to pay smaller amounts of money sooner than larger amounts when accounting for older adults' greater financial literacy.

Three Dimensions of Financial Experiences

To determine whether financial literacy and the three types of financial experiences statistically accounted for age-related variance in preferences for sequences to receive and pay money, two parallel mediations were conducted. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates.

The overall model explained 26.4% of the variance in preferences for sequences to receive money, $F(11, 582) = 3.96, p < .001$. There was a significant indirect effect of age on preferences for sequences to receive money through financial literacy ($b = -.002, 95\% \text{ CI } [-.004, -.0003], p = .02$). There was not a significant indirect effect through common experience ($b = -.001, 95\% \text{ CI } [-.003, .0006], p = .22$), advanced experience ($b = -.001, 95\% \text{ CI } [-.004, .001], p = .40$), nor costly experience ($b = -.0004, 95\% \text{ CI } [-.002, .0001], p = .06$). After including the significant indirect path through financial literacy, the direct effect ($b = -.012, p = .008$) of age on preferences for sequences to receive money was no longer significant ($b = -.01, p = .10$). This indicated that older adults' normatively correct preferences for receiving larger amounts of money sooner than later was accounted for by greater financial literacy.

Next, indirect effects of age on preferences for sequences to pay money were examined. The overall model explained 27.5% of the variance in preferences for sequences to receive money, $F(11, 582) = 4.34, p < .001$. There were significant indirect effects of age on preferences for sequences to pay money through financial literacy ($b = -.002, 95\% \text{ CI } [-.004, -.001], p < .001$) and common experience ($b = -.002, 95\% \text{ CI } [-.004, -.001], p = .01$). There was not a significant indirect effect through advanced financial experience ($b = .0001, 95\% \text{ CI } [-.003, .002], p = .98$) nor costly experience ($b = .0002, 95\% \text{ CI } [-.0002, .001], p = .40$). After including the two significant indirect paths, the direct effect of older age on preferences for sequences to pay money ($b = .004, p = .37$) was even *stronger* than when not taking the paths into account ($b = .008, p = .06$). That is, there was a suppressor effect, where controlling for the path through financial literacy and common experience amplified the positive association between age and preferences for sequences to pay money. Hence, older age was associated with reporting

preferences to pay smaller amounts of money sooner than larger amounts when accounting for older adults' greater financial literacy and common financial experience.

Appendix I

Age Differences in Choosing “Don’t Know” as a Response on Financial Literacy Items

To examine if there were age differences in choosing “don’t know” as a response to the financial literacy items, each financial literacy item was recoded such that 1 = “don’t know” and 0 = all other responses. Then, a composite score was created by summing the 13-items.

To examine if age was associated with choosing “don’t know” as a response to financial literacy items, a bivariate correlation was conducted. There was a negative association ($r = .17, p < .001$) such that younger age was associated with choosing “don’t know” as a response more often.

Appendix J
Correlations between Age and Each Monetary Vignette

	1	2	3	4	5	6	7	8	9
1. Age	-								
2. Receiving Inheritance	-.13*	-							
3. Receiving Job Income	-.07	.48**	-						
4. Receiving Leasing Income	-.12*	.52**	.55**	-					
5. Receiving Lottery	-.002*	.67**	.50**	.55**	-				
6. Paying Money Owed	.04	.01	.01	.002	-.03	-			
7. Paying for a House	.04	-.03	.04	.06	.01	.53**	-		
8. Paying for a Car	.01	.03	.01	.05	.01	.53**	.51**	-	
9. Paying to Consolidate Credit Card Debt	.01	.05	.03	.06	.02	.56**	.54**	.61**	-

Appendix I
Means and Standard Deviations of each Monetary Vignette

Vignettes	<i>M</i>	<i>SD</i>
Receive Money		
Inheritance	2.90	1.90
Income from Job	3.59	1.76
Income from Leasing Building	3.23	1.77
Lottery	2.99	1.91
Pay Money		
Owe money	2.65	1.75
Buying a House	2.75	1.68
Buying a Car	2.59	1.62
Consolidating Credit Card Debt	2.62	1.66

Note. 1 (start with **larger amounts** first, end with the smaller) to 6 (start with **smaller amounts** first, end with the larger).

Appendix J New Financial Literacy Variables

The original financial literacy variable in the main analyses was scored based on correct (1) and incorrect (0) responses. Participants had the option of selecting ‘don’t know’ or ‘refuse to answer’ on items, which were also scored as an incorrect response.

To further explore the incorrect responses, only items where participants actively choose the wrong answer were coded, and responses of ‘don’t know’ and ‘refuse to answer’ were excluded. Thus, there were correct (1) and incorrect (e.g., only responses that participants actively choose the wrong answer) (0). Scores were then averaged across all items, and higher scores indicated greater financial literacy ($M = .70$, $SD = .19$). Age was associated with greater financial literacy ($r = .14$, $p = .001$). When controlling for financial experience, age was no longer associated with financial literacy ($r = .01$, $p = .83$). Financial literacy was negatively associated with both preferences to receive ($r = -.16$, $p < .001$) and pay money ($r = -.19$, $p < .001$). Thus, greater financial literacy was associated with normatively correct preference to receive money, but non-normative preferences to pay money. When controlling for financial experience, financial literacy remained significantly associated with preferences to receive ($r = -.10$, $p = .01$) and pay money ($r = -.16$, $p < .001$).

Next, to explore the responses of ‘don’t know’ and ‘refuse to answer,’ another variable was created. This variable of financial literacy was coded as correct = 1 and both ‘don’t know’ and ‘refuse to answer’ = 0. Scores were then averaged across all items, and higher scores indicated greater financial literacy ($M = .80$, $SD = .25$). Age was associated with greater financial literacy ($r = .17$, $p < .001$). When controlling for financial experience, age was no longer associated with financial literacy ($r = .06$, $p = .15$). Financial literacy was negatively associated

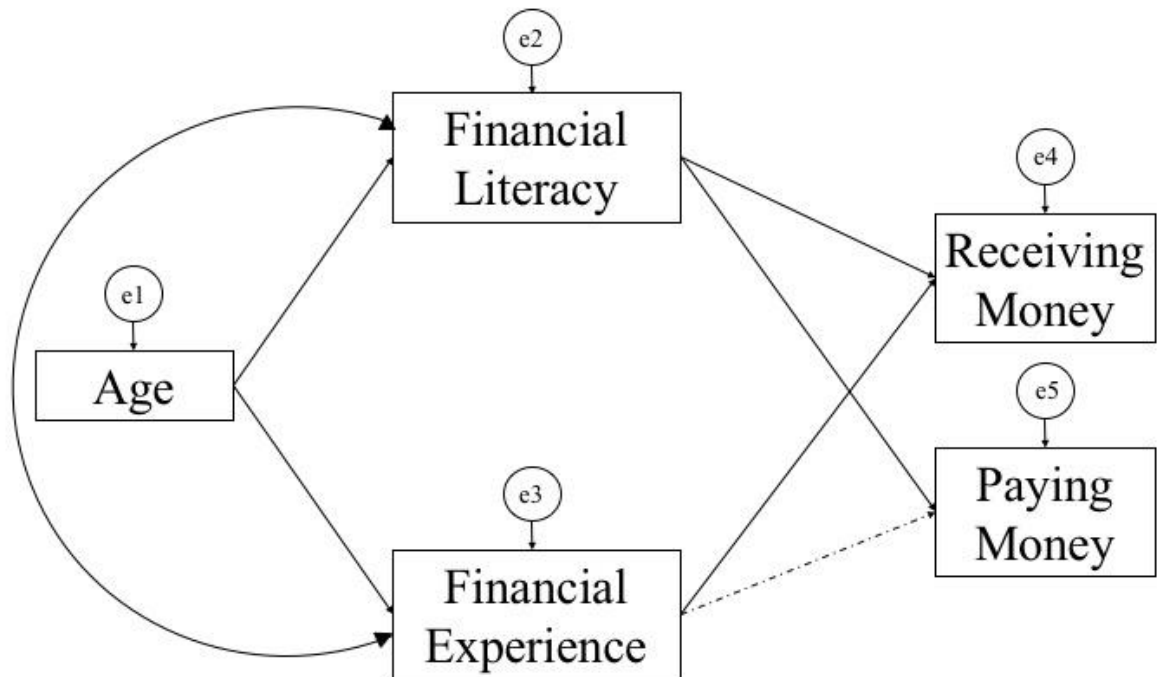
with both preferences to receive ($r = -.12, p = .004$) and pay money ($r = -.11, p = .006$). Thus, greater financial literacy was associated with normatively correct preference to receive money, but non-normative preferences to pay money. When controlling for financial experience, financial literacy was no longer significantly associated with preferences to receive ($r = -.05, p = .19$) or pay money ($r = -.07, p = .08$).

Appendix K

Structural Equation Model of the Relation between Age and Monetary Sequence Preferences

A structural equation model was performed to examine a model of age and monetary sequence preferences. Participant gender, race/ethnicity, education, income, employment, and marital status were entered as covariates. Data were analyzed using structural equation modeling (SEM) in SPSS Amos 24.0. Significant paths were interpreted after achieving acceptable model fit ($\chi^2/df < 3.00$, CFI $> .90$, RMSEA $< .08$; Kline, 2005).

Because financial literacy and financial experience were positively correlated, these two mediators were allowed to covary in the model. The proposed model provided an adequate fit to the data (CMIN/DF = 1.929, CFI = 0.996, RMSEA = 0.04). Significant direct effects were found, such that older age was associated positively with financial literacy ($\beta = 0.002$, SE = .001, $p < .001$) and financial experience ($\beta = 0.013$, SE = .002, $p < .001$). Financial literacy was negatively associated with both receiving ($\beta = -0.64$, SE = .29, $p = .03$) and paying money ($\beta = -1.05$, SE = .27, $p < .001$). Thus, greater financial literacy was related to preferences to receive larger amount of money sooner than later, but to also pay larger amounts of money sooner than later. As such, greater financial literacy was associated with normatively correct preferences for receiving, but not paying money. Financial experience was negatively associated with receiving money ($\beta = -0.33$, SE = .11, $p = .003$), but not paying money ($\beta = -0.08$, SE = .10, $p = .44$). Thus, greater financial experience was related to the normatively correct preference to receive larger amount of money soon than later.



Note. Solid lines represent significant direct effects. Demographic covariates were included in the model (e.g., gender, race/ethnicity, education, income, employment, and marital status).