Golden Or Graying? Cognitive Ability and Experience Predict Financial Outcomes Across the Lifespan

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Greater crystallized intelligence in older adults may compensate for their declining fluid intelligence for decision-making. We explore whether this interaction extends to real-world financial behaviors by combining measures of cognitive ability and knowledge with credit report data. We find support for the positive roles of fluid intelligence and domain-specific expertise.

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Paper #1: Golden or Graying? Cognitive Ability and Experience Predict Financial Outcomes Across the Lifespan
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Paper #2: Brand Memory and Aging: Accounting for Specific Age Reveals Superior Memory for Older Compared to Young Consumers
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Paper #3: Aging and Product Choice: The Effects of Feel-Age and Social Context
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Paper #4: The Age of Materialism: Age, Period, & Cohort Effects Across the Life Cycle
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SESSION OVERVIEW
Worldwide population is undergoing a significant shift with the increasingly growing proportion of older adults. Thus older consumers are of key interest to academics and practitioners. More work on older consumers is needed, especially at the conceptual level, given the relative paucity of prior research. This session aims to address this deficiency by tackling two overarching questions. While chronological age is obviously a critical variable in investigations of older consumers, what other age-related variables play a mediating role between chronological age and behavior? What are some explanatory variables and moderators to consider in combination with chronological age?

The four papers offer innovative approaches to these questions. The first two papers show the importance of taking into account, in addition to a consumer’s current age and abilities, the experience, capabilities and knowledge accumulated over the consumer’s lifetime as well as the age at which they were acquired. The third paper demonstrates the need to consider how feel-age in addition to chronological age affect product choice, and further reveals that a consumer’s feel-age varies as a function of social context. The fourth paper tackles the ever thorny problem of disentangling the effects of age, cohort, and period. It demonstrates, using the example of materialism, an approach that combines a new statistical method with a sound theoretical approach.

The first paper, “Golden or Graying? Cognitive Ability And Experience Predict Financial Outcomes Across the Lifespan,” focuses on the complementary capabilities of fluid intelligence and crystallized intelligence. It shows how older adults may compensate for the decline in the former with the latter: domain-specific expertise acquired over the lifetime, such as financial literacy. The authors utilize measures of consumer current cognitive ability and accumulated knowledge with real-world financial behaviors in the form of credit report data.

The second paper, “Brand Memory And Aging: Accounting For Specific Age Reveals Superior Memory For Older Compared to Young Consumers,” shows how both a consumer’s chronological age today and specific age (defined as the consumer’s age when a brand was initially launched) affect memory of brands learned over one’s lifetime, and how this relationship is mediated by cognitive ability. Compared with young consumers, older consumers have worse memory for recent brands, but equivalent or better memory for brands encountered before age 30. Hence older consumers hold a biased perception of the market.

The third paper, “Aging And Product Choice: The Effects of Feel-Age And Social Context,” focuses on older consumers’ tendency to feel younger than they actually are. It reveals that this feeling varies as a function of social context, namely of the presence of young versus older people. It then investigates how older consumers choose more youthful products in the presence of young people as a way to feel more at ease.

The fourth paper, “The Age of Materialism: Age, Period, & Cohort Effects Across the Life Cycle,” applies a new statistical approach (Multilevel Latent Growth model) to disentangle age, period, and cohort effects. Application to variations in materialism across the life cycle using a panel of 4700 consumers across eight waves reveals that younger and older people are more materialistic, which is partly due to younger birth cohorts being more materialistic. The statistical approach has potentially very broad applications beyond this specific case.

Golden or Graying? Cognitive Ability And Experience Predict Financial Outcomes Across the Lifespan

EXTENDED ABSTRACT
One in five Americans will be over 65-years-old by 2030. This demographic shift will be accompanied by two trends: The first is that people accumulate wealth up to retirement and subsequently face decisions about how to spend that wealth while guarding against the possibility of running out of money. Moreover, as companies shift from defined benefit retirement plans (pensions) to defined contribution plans (e.g., 401(k)s), individuals face an increasing number of important and often complex financial choices later in life.

The second age-related trend is one of the most replicable and sizeable in psychology: the brain slows with age. Studies have shown that fluid intelligence (Gf)—the set of abilities related to generating, transforming, and manipulating novel information—falls by nearly two standard deviations from age 20 to 70 (Salithouse 2010; Schae 1993). Given mounting evidence that cognitive ability is a key determinant of decision-making (Agarwal et al. 2010; Agarwal and Mazumder 2013; Burks et al. 2009; Mani et al. 2013; McArdle, Smith, and Willis 2011), age-related deterioration of Gf raises the specter that people with major responsibility for financial decisions may be increasingly unable to make them. Fortunately, declining Gf is accompanied by increasing crystallized intelligence (Gc) (Carroll 1993; Carroll and Willis 2013; Burks et al. 2009; Mani et al. 2013; McArdle, Smith, and Willis 2011).
Cattell 1987), i.e., the accumulation of knowledge and experience that increases with age into the 60s and plateaus thereafter (Horn and Cattell 1967; Li et al. 2004; Salthouse 2004, 2010). $G_i$ may therefore represent a kind of intellectual capital that may circumvent declining $G_c$, producing sharp-minded octogenarians.

Importantly, the effect of age on decision quality also depends on the relative impact of the two types of intelligence required for the decision. Deficits in $G_i$ might be compensated for only in situations in which the decisions can rely on the accumulated $G_c$. If $G_i$ is a more important determinant of decision performance than $G_c$, we might even expect older adults to perform better. The opposite would be true for tasks requiring more $G_c$. For decisions made equally well using either or both pathways, we may see no net age effect on decision quality.

We examine whether this interaction between $G_i$ and $G_c$, which we term Complementary Capabilities (Li et al. 2013)—affects the ability to make good financial decisions. We use a unique data set that combines extensive measurements of cognitive ability and economic phenotypes (i.e., risk, loss, and time preferences) with field observations of those same individuals’ economic performance.

Our cognitive data comes from a four-part study in which 478 U.S. residents between 18 and 86 completed a battery of cognitive, decision-making, and demographic measures. We obtained credit report data for these participants from a major credit bureau. Maintaining high credit scores reflects sustained ability to make good financial decisions and brings substantial benefits increased likelihood of obtaining loans at lower interest rates. To the best of our knowledge, this study is the first to combine credit report data with multiple standard measures of $G_i$, $G_c$, and economic phenotype assessments.

We conducted all analyses using structural equation modeling but present, for simplicity, the results of linear regressions using the factor scores from the SEM. We conducted multiple regressions of credit score on age and other demographic variables (Model 1), cognitive ability (Model 2), and a number of other control variables.

Model 1 shows that credit scores increase by an average of 13 points per decade of age, comparable to the effect of an additional year of education or a doubling of income. Model 2 verifies the positive relationship between credit scores and $G_i$ but suggests that domain-general $G_i$ is unrelated to financial decision-making ability.

We replaced the general $G_i$ measures with a domain-specific measure of financial $G_i$ in Model 3 and all subsequent analyses, specifically, financial literacy ($G_{f,FL}$), or the ability to understand financial information and decisions (Lusardi and Mitchell 2007). Model 3 shows that even after controlling for demographics, credit scores positively relate to $G_i$ and $G_{f,FL}$. One standard deviation increase in $G_i$ (equivalently 15 points of IQ) corresponds to a credit score increase of 18 points, whereas one standard deviation of $G_{f,FL}$ corresponds to an increase of 66 points. In addition, the reduced age coefficient in Model 3 suggests that $G_i$ and $G_{f,FL}$ partly explain the effect of chronological age on credit scores.

Model 4 controls for financial experience as self-reported on 20 different financial instruments (e.g., credit cards, mortgages, mutual funds, etc.). The fact that the effect of $G_{f,FL}$ remains significant suggests that good financial decisions require understanding financial products, not just experience using them.

We also measured individual differences in risk, loss, and time preferences using state-of-the-art adaptive measurement tasks (Toubia et al. 2013). Model 5 adds model estimates for these preferences as covariates in Model 3. Consistent with recent findings (Meier and Sprenger 2012), credit scores were higher for people with more patient time preferences. Importantly, the effect of $G_i$ is no longer significant after controlling for time preference, consistent with a positive relationship between $G_i$ and patient time preferences (Dohmen et al. 2010; Li et al. 2013). That is, part of the reason that people with higher $G_i$ have higher credit scores is that they exhibit more patience in financial decisions.

Finally, we control for other important psychological factors known to influence a wide range of behaviors. Model 6 controls for the DOSPERT risk-taking scale (Weber, Blais, and Betz 2002), which has been shown to correlate with many real-world risk-taking behaviors (Brown and Braver 2007; Harrison et al. 2005; Markiewicz and Weber 2013). Model 7 controls for Big Five personality measures (Digman 1990). Both Models 6 and 7 find similar results for the effects $G_i$ and $G_{f,FL}$ even after controlling for these other important psychological variables.

In summary, decreasing fluid intelligence does not spell doom for older adults’ decision-making. Instead, their improved crystallized intelligence, particularly in the financial domain, seems to provide an alternative pathway to making good financial decisions. These complementary pathways cannot be explained by other demographic differences, financial experience, economic phenotypes, or personality variables.

**Brand Memory and Aging: Accounting For Specific Age Reveals Superior Memory For Older Compared to Young Consumers**

**EXTENDED ABSTRACT**

Chronological age has a major and complex effect on the brands that a consumer knows (i.e., recognizes) and those that a consumer spontaneously recalls. These two forms of brand memory are important determinants of the composition of consideration sets, whether consumers engage in memory-based choice or stimulus-based choice. Building on previous experimental research, the present paper investigates memory for real-world brands (radio stations) that older consumers have learned about over the course of their lives.

We examine the impact of chronological age at two different times: the consumer’s age today and the consumer’s “specific age” relative to a brand (defined as one’s age when the brand was first launched in the marketplace). Our hypotheses rely on previous research regarding age-related impairments in both encoding and retrieval processes, such as in spontaneous recall (Park et al. 2002); poorer lexical knowledge by older people of “contemporary” words compared with their knowledge of “dated” words (Worden and Sherman-Brown 1983); and declining memory of autobiographical events that occurred after the age of 30 years (Janssen, Chessa, and Murre 2005). Although our present work focuses on cognitive explanations, we acknowledge the potential effect of affective factors demonstrated in previous research that older people like older brands more (Holbrook and Schindler 1994). We do so by controlling for the differential liking of older brands and report its significant impact in many of our analyses.

Age today is important because it affects the probability that consumers spontaneously recall brands they know (i.e., recognition in an aided brand recall task). On the basis of the age-related decline in cognitive ability, we hypothesize that (H1), compared to young consumers, older consumers are less likely to spontaneously recall the brands they know, and that (H2), among the brands they know, older consumers are more likely to recall spontaneously those that were introduced when they were younger. Consistent with H1, older consumers recall a smaller percentage of the stations they know. But the support for H2 is so strong that it leads to a result that stands in contrast to H3, depending on the age of the brand. Compared with young consumers, older consumers are less likely to spontaneously
recall the recent radio stations they know, but more likely to spontaneously recall old radio stations they know. Thus, empirical support for \( H_1 \) when analyzing overall brand recall does not seem to apply to recall of old brands for which older consumers do better than young consumers. This result challenges the common view that older people always exhibit poorer performance on memory tasks.

Regarding the underlying process, we hypothesize \( H_1 \) that cognitive ability today (speed of treatment) mediates the impact of age on spontaneous recall. This hypothesis holds for recent stations but not for old stations. We find no impact of cognitive decline in this latter case which constitutes another counterintuitive result.

Specific age for a given brand is important because it determines the probability of knowing that brand today (assessed via recognition). We hypothesize \( H_3 \) that recognition should be highest among consumers who were in their 20s when the brand was launched, whereas \( H_4 \) among consumers in their 30s or older at launch time, the probability of knowing the brand today should decrease monotonically with their specific age. The results are mixed. First, for 6 of the 20 leading stations, there is no impact of specific age on current knowledge. These stations (5 old, 1 recent) include 4 of the 5 leading stations, known by almost everyone (<97.6%). Here, older listeners perform as well as younger ones. Second, for the other 14 stations, we always obtain a strong decline of current knowledge for high values of specific age, with typically low knowledge for a specific age of 60 years. Recent stations targeting older listeners are no exceptions in this regard.

We further hypothesize that the total numbers of known brands \( H_4 \) and spontaneously recalled brands \( H_5 \) should decrease with a consumer’s age today, and that the average age of known brands \( H_6 \) and spontaneously recalled brands \( H_7 \) should increase with consumer’s age today. Because we found such notable differences between old and recent stations in our previous analyses, we assessed their knowledge and recall separately, and again, find mixed results. Both \( H_4 \) and \( H_5 \) received support with respect to recent stations: Knowledge and spontaneous recall were worse among older respondents. However, these hypotheses are found not to hold for old stations, for which, compared with young consumers, older consumers know more and exhibit better spontaneously recall. Finally, we confirm that the average age of known stations \( H_6 \) and spontaneously recalled stations \( H_7 \) increase with consumer age today.

In summary, a consumer’s age significantly affects the set of brands the consumer knows, as well as the set of brands he or she recalls spontaneously, in four ways. Older consumers know more old stations and fewer recent stations. Among the stations they know, they are more likely to spontaneously recall old stations and less likely to recall recent stations. These four effects converge to show that older consumers know and recall spontaneously fewer brands and older brands. They, in turn, develop a restricted and dated view of the market, in terms of both knowledge and spontaneous recall. This produces more limited consideration sets and choices for older consumers compared to their younger counterparts. At the same time, our results serve to challenge the intuitive notion of a general decline of brand memory with age. Although older consumers, compared to young consumers, do have poorer memory for brands that are recently introduced as would be expected, they exhibit equivalent or sometimes better memory for brands that were encountered at low specific ages (i.e., when they were younger than 30).

### Aging And Product Choice: The Effects of Feel-Age And Social Context

**EXTENDED ABSTRACT**

The increasing aging of worldwide population is an important trend for marketers. Older consumers represent a market segment that is of interest to both practitioners and academic scholars (Guido 2014; Yoon and Cole 2008; Yoon, Cole, and Lee 2009). Prior research has shown that older people systematically state they feel younger than they actually are (Barak 1987; Sherman, Schiffman, and Mathur 2001), and that this tendency may vary across contexts (Guido, Amatulli, and Peluso 2014). In the present paper, we seek to understand how the social context influences the tendency by older consumers to report a feel-age (i.e., the age one feels) that is lower than their chronological age. In three studies, we show that this tendency is magnified by the presence of young people in social contexts, and investigate how older consumers choose more contemporary versus traditional products as a way to feel greater ease in such social contexts.

Study 1 tested whether the tendency by older consumers to report a feel-age lower than their chronological one increases when they are exposed to a young social cue rather than an old one. Eighty-six consumers aged 65 and over were intercepted close to shopping sites and randomly assigned to one of two conditions: young or old social cues. The interviewers who were blind to the study hypotheses served as social cues. Respondents in the young social cue condition were interviewed by a young interviewer, whereas those in the old social cue condition were interviewed by an older interviewer. After answering some filler questions, participants reported the age they felt at that moment and their actual date of birth.

The tendency by older consumers to state a feel-age different from their chronological age was computed as a Youth Age (YA) index which is the difference between the chronological age of respondents and their stated feel-age (Barak 1987). As expected, participants in the young social cue condition reported a higher YA \( (M = 15.90) \) than those in the old social cue condition \( (M = 7.87) \), \( p = .008 \).

Study 2 investigated the mechanism that might drive this tendency. Building on prior research (Kawakami et al. 2012; Mead et al. 2011), we theorized that being exposed to a social context perceived as chronologically distant from the self may cause older consumers not to feel at ease in that context. Thus, older consumers should feel less in harmony with a context in which other people are young. Such a lower sense of harmony, in turn, might cause older consumers to adapt by reducing the perceived distance from the young people in their context. We predicted that stating a feel-age that is lower than the chronological age is a means by which older consumers adapt the self to fit with others who are young. Thus, older consumers’ sense of harmony should mediate the effect of social cue on their tendency to state they feel younger (i.e., YA). Two hundred twenty-seven older consumers participated in a field study. Respondents received a questionnaire by an interviewer, who did not interact with them, close to real shopping sites typically attended by either young or older people (e.g., disco-pubs vs. senior recreation centers). Respondents first reported their feel-age and indicated how they perceived their context (1 = most of the people around me are old, 7 = most of the people around me are young). Then, respondents reported their sense of harmony captured via three items (e.g., “I feel at ease with people around me”; 1 = strongly disagree, 7 = strongly agree; \( \alpha = .61 \), and their date of birth. After computing YA as in Study 1, we tested our prediction in a simple mediation model. We found a negative effect of social context on sense of harmony \( (p < .001) \), a negative effect of sense of harmony on youth age \( (p = .001) \), and an effect
of social context on the youth age index that became non-significant when sense of harmony was included in the model. The indirect effect of social context on youth age was positive and significant ($b = .35, p < .05$), thus confirming our prediction.

Study 3 tested whether being exposed to young people may lead older consumers to adapt their selves by choosing contemporary rather than traditional products. The study was designed as a 2 (respondent’s age: young vs. old) × 2 (social cue: young vs. old) between-subjects experiment. Four hundred participants, both young and older consumers, were first exposed to a picture displayed either a pair of young or a pair of old people, which served as the social cue. Participants were then asked to choose an option across four different choice sets. Each choice set contained a contemporary and a traditional version of the same product. The individual tendency to prefer contemporary options was captured by the percentage of times these options were chosen across the four choice sets, which ranged from 0% (the contemporary option was never chosen) to 100% (the contemporary option was always chosen), and served as dependent variable in the analysis. We found a significant interaction between respondent’s age and social cue ($p = .005$). Contrasts revealed that the tendency by old respondents to prefer contemporary options was higher when they were exposed to a young ($M = 41.55\%$) rather than an old social cue ($M = 27.91\%$), $p = .001$. The tendency by young respondents to prefer contemporary options did not vary as a function of social cue.

This present research advances our understanding of how the social context affects older consumers’ tendency to state they feel younger, and elucidates the underlying processes that affect their choice behavior. Results suggest that exposing older consumers to young social cues might prompt them to choose more youth-oriented options.

The Age of Materialism: Age, Period, & Cohort Effects
Across the Life Cycle

EXTENDED ABSTRACT

Do consumers become less materialistic when they grow older or do they actually become more materialistic? Likewise, are older birth cohorts of consumers, such as the Baby Boomers (born between 1946 and 1964), less materialistic than younger birth cohorts, such as Generation X (born between 1965 and 1981), or are they more materialistic? And finally, does the current period of global economic downturn prompt consumers to become more or less materialistic? These questions deal with three fundamental influences.

The U-shaped relationship between age and overall materialism, with the lowest levels of materialism around the age of 62, and higher levels before and after that age. In addition, the most recent birth cohorts (born after 1980) have higher levels of materialism. The influence of the current economic downturn on materialistic values depends on age. Whereas older people’s materialism declines, younger people’s materialism increases.

The present research aims to contribute to closing the knowledge gap about age, period, and cohort effects on consumer materialism. First, it extends the Motivational Theory of Life-Span Development (Heckhausen, Wrosch, and Schulz 2010) to account for and predict the influence that age, period and cohort have on materialistic values across the life cycle. Second, it estimates a Multilevel Latent Growth model that deals with the well-known limitations of APC analysis (Yang and Land 2013; Yoon et al. 2009), by identifying the separate main and interactive effects of age, period, and cohort. Recall, that in cross-sectional designs where people of different ages are observed at one point in time, age and cohort effects are confounded (Miyazaki and Raudenbush 2000). In data from multiple time periods for the same age group, period and cohort effects are confounded. In additive statistical models, each of the factors is completely defined by the other two factors (Cohort = Period – Age), which is referred to as the APC identification problem (Mason and Fienberg 1985). As a result, traditional data and regression models cannot provide a unique solution to APC models. The methodology implemented here solves this.

Using longitudinal data (2005-2013) from a representative Dutch sample (over 4700 participants) covering a broad age span (16-90 years at the start of the study), this study employs a Multilevel Latent Growth model to disentangle the effects of age, period and cohort on materialism across the life cycle. Table 1 provides summary descriptive. Individual change in materialism over time is a function of age and period. Since the economic downturn might not influence people from all ages in the same way, the model also includes an Age x Period interaction effect. Cohort effects are captured by cohort-specific intercepts. Models are estimated for overall materialism, but also for the three subtypes of materialism: acquisition centrality, possession-defined success, and acquisition as the pursuit of happiness (Richins and Dawson 1992).

The findings reveal a U-shaped relationship between age and overall materialism, with the lowest levels of materialism around the age of 62, and higher levels before and after that age. In addition, the most recent birth cohorts (born after 1980) have higher levels of materialism. The influence of the current economic downturn on materialistic values depends on age. Whereas older people’s materialism declines, younger people’s materialism increases.

The U-shaped relationship between materialism and age was found for all three materialism subtypes. However, age differences in acquisition centrality and acquisition as the pursuit of happiness become insignificant after controlling for cohort effects. The observed age differences are due to the youngest birth cohorts (born after 1970 and 1975) being most materialistic. Such cohort effects are not observed for possession-defined success. The interaction effect between age and period also differs across the subtypes. For
instance, the economic downturn increases acquisition as the pursuit of happiness among both younger and older people.

Using a Multilevel Latent Growth model, this study sheds light on the effects of age, period and cohort on materialism. It finds that age differences in materialism exist but are overestimated if cohort effects are not controlled for. The relationship between materialism and age is U-shaped and driven by the subtype possession-defined success. Age differences in acquisition centrality and acquisition as the pursuit of happiness are driven by cohort effects. The influence of the economic downturn on materialism depends on one’s age. These findings point to the importance of disentangling age, period and cohort effects in studying materialism and consumer behavior.

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