RETIREMENT INCOME INSTITUTE
Alliance for Lifetime Income

ESSAY
NOVEMBER 2021
Retirement Income Institute Essay #006-2021

WHAT CAN SCHOLARLY RESEARCH TELL US ABOUT COGNITIVE AND BEHAVIORAL IMPEDIMENTS TO ANNUITIZATION? DO THESE IMPEDIMENTS VARY WITH RACE/ETHNICITY AND GENDER?

ABSTRACT

This essay surveys the academic literature on behavioral impediments to annuitization, and finds that the framing of annuitization as an investment or a consumption decision can affect whether households annuitize. Households struggle to compare lump sums with income streams, but appear to be able to make context-specific choices between a lump sum and lifetime income. Complexity has been shown to be a deterrent to annuitization, but the effects of financial literacy are unclear. This essay questions whether the results of laboratory experiments are predictive of real-life behavior, and identifies factors such as procrastination that are not captured by laboratory experiments but that could affect the annuitization decision. This essay concludes by proposing lessons for financial advisors and policymakers, and suggesting directions for future research.

BY ANTHONY WEBB

INTRODUCTION

This essay surveys the scholarly research on behavioral and cognitive barriers to annuitization, suggests ways in which financial advisors and plan sponsors could apply the research to obtain better household financial outcomes, and proposes directions for future research.

Annuities provide households with insurance against the risk of outliving their wealth. Theoretical calculations show that this longevity insurance is so valuable that even households with shorter-than-average life expectancies would benefit by annuitizing at least part of their wealth (Gong and Webb 2008).[1] However, few households voluntarily annuitize any of their 401(k)/IRA assets. Although some researchers have attempted to explain this annuity puzzle by proposing specifications of household preferences that put greater weight on a bequest motive or health-care cost risk, among other criteria, many other researchers consider that behavioral and cognitive biases play an important role in explaining low annuitization rates.[2]

1. This is true even though annuities are also actuarially unfair in the sense that the expected present value of the income stream, discounted by a rate of interest and population average survival probabilities, is less than the premium paid, reflecting the need for insurers to set prices that reflect the low mortality rates of typical purchasers (Mitchell et al. 1999).
2. I disregard a third and a fourth category of explanations—that households are unaware of the existence of financial products that insure against longevity risk and that the current annuity market does not offer the types of products that households would want to purchase (Beshears et al. 2014). For example, inflation-indexed immediate annuities have been withdrawn from the market and advanced life deferred annuities offer only benefits fixed in nominal terms.

We normally think of the annuity purchase decision in the context of the purchase of an annuity from an insurance company. But households also face an annuity purchase decision when deciding whether to delay claiming Social Security or when choosing between a lump sum and a lifetime income from a defined benefit retirement plan.[3] This essay therefore considers research that assesses how households approach all three decisions and finds that, on closer inspection, the annuity puzzle is even more of a puzzle than it first appears. Households do not shun annuities in all situations and their choices often seem to be context-specific. The Social Security program, an annuity in all but name, remains highly popular. Defined benefit plan participants often choose the annuity option (Bütler and Teppa 2007). In contrast, military veterans in a downsizing program shunned the annuity option even though it was a far better deal than the lump sum (Warner and Pleeter 2001).

Nonetheless, laboratory experiments yield several robust findings. Framing annuitization as an investment or an insurance decision also affects take-up, as does whether households are induced to think jointly about annuitization and asset drawdown in retirement. Complexity is a significant barrier to annuitization, and the effects of complexity vary by race, gender, and social class. My concern with these experiments is that it is unclear to what extent the behaviors observed in the laboratory can be replicated in the real world.

BEHAVIORAL AND COGNITIVE BARRIERS TO ANNUITIZATION

THE IMPACT OF FRAMING

Households have little difficulty understanding the value of insurance against a bad outcome, such as crashing one's car. Households could self-insure against this risk by setting aside money to purchase a new car, but they understand it is less expensive to buy the insurance. Similarly, households have a choice between self-insuring against the bad financial outcome of living longer than expected, setting aside money they will spend if they live to the age of 100 but will otherwise pass on as a possibly unintended bequest, and purchasing an annuity. Few choose the annuity option. The hypothesis is that households may struggle to understand the value of insurance against the financial consequences of something—enjoying a long life—that is a cause for celebration. They instead frame the annuity purchase decision not as the purchase of valuable insurance, but rather as a risky gamble they will lose if they die young. With auto insurance we often either observe or hear about accidents, and so we understand the financial risk of failing to purchase insurance. In contrast, the elevated rates of poverty among the oldest old are perceived almost as a natural state of affairs, rather than as a consequence of inadequate longevity insurance.

Several papers report the results of experiments that appear to show that framing influences the value that households place on annuities. Framing is perhaps most salient in the context of the Social Security claiming decision where delay is often framed not as the purchase of additional longevity insurance but rather in terms of the number of years the worker must survive to recoup the benefits forgone through delay.[4] The break-even age is an irrelevant piece of information because it tells the retiree nothing about whether delay (the purchase of additional longevity insurance) will enable the household to enjoy greater lifetime consumption.

Framing studies have used laboratory experiments in which participants play a retirement game (Agnew et al. 2008) and have conducted surveys of intentions and preferences (Brown, Kapteyn, and Mitchell 2016; Brown et al. 2008, 2013). In Agnew et al. (2008), participants were first tested for financial literacy and risk aversion; as expected, the women were more risk averse than the men and also scored lower on the test of financial literacy. Participants were given $60 that they could use to purchase an annuity, withdraw, or invest in either the "stock market" or a "risk-free asset." If they purchased the annuity, they received $16.77 each round of the game until they "died." Participants who did not annuitize kept money they withdrew and forfeited any remaining money once they "died."

The two main treatment variables in the investment experiment were whether there was a default choice (investment, annuity, or none) and whether the infor-

3. Delayed claiming of Social Security is equivalent to an additional purchase of the Social Security annuity. A worker who delays claiming can be thought of as purchasing an increased monthly benefit for life in return for the benefit checks forgone.
4. In April 2021 a Google search for "Social Security break even calculator" yielded 13,400 responses.

mation provided to subjects was biased toward one of or neither of the options. The authors found that the more risk-averse were more likely to choose the annuity, as were women, even after controlling for risk aversion. The more financially literate were more likely to choose the investment option. The default option had little effect, a finding that is inconsistent with previous research into 401(k) participation that showed defaults can have a powerful effect.[5] Framing mostly had an effect. Negative framing of the annuity option decreased annuity take-up of the annuity by both men and women, but negative framing of the investment option increased annuity take-up only by women.

My concern with the study is whether the behavior observed in the game will be, or even should be, replicated in real life. To illustrate, the finding that women and the more risk-averse are more likely to choose the annuity is consistent with previous studies into attitudes toward risk. But should people be risk averse in a game with only $60 at stake, a trivial amount of money? The fact that the more financially literate were more likely to choose the investment option could indicate nothing more than that the financially literate were better able to figure out how to play the game. Perhaps some participants treated the exercise as nothing more than a game that did not reflect real life and others treated the exercise as mirroring real life, as the researchers had intended.

In Brown, Kapteyn, and Mitchell (2016), survey participants were asked when they expected to claim Social Security. The authors exposed the participants to additional information and then repeated the question. Consistent with Agnew et al. (2008), these authors found that a break-even frame encouraged participants to report an earlier expected claim age. But they also found that participants were more likely to delay claiming Social Security when delayed claiming was framed as a gain (delaying claiming will increase benefits by $X per month) and when the claiming age was anchored at older ages.[6] The researchers found that the less financially literate were more susceptible to framing. The concern is whether the large effects observed in the study carry over to real life when social norms, mental accounting, and prior exposure to framing cues may all have an effect.[7] For example, households can and often should use their retirement plan balances to bridge the gap between retirement and delayed claiming of Social Security. But households practicing mental accounting might not even consider this possibility.

Researchers have attempted to control for household-specific characteristics that may bias responses by presenting survey participants with vignettes that avoid using the word "annuity" and asking the participant what they would recommend or which person has made the better choice. In Brown et al. (2008, 2013) participants were asked which of two people had made a better choice—the person who invested in a savings account or the person who purchased an annuity—with the two choices being described using words that elicited either a consumption or an investment framing.[8] The study found that framing had a dramatic effect on assessments of who had made the better choice.

The lesson drawn from this literature is that framing matters but that it will likely take more than a single presentation or mass mailing to overcome a lifetime of conditioning.

VALUING LUMP SUMS

Making the optimal choice between a lump sum and an income stream requires complex financial and actuarial

5. In contrast, in a similar experiment Gazzale, Mackenzie, and Walker (2012) found that defaults had a strong effect.
6. It is not possible to anchor a gain frame at age 70 or a loss frame at age 62, so to distinguish the gain/loss hypothesis from age anchoring the researchers included both gain and loss frames anchored at age 66.
7. For example, most people arriving at a movie theater planning to buy a $10 ticket would still proceed with the purchase if they discovered that there was $10 less in their wallet than they thought they had. But fewer than half would buy a new ticket if they had purchased a $10 ticket in advance and then lost that ticket. The losses are identical but are subject to different mental accounting rules—one for ticket money and the other for general spending.
8. To illustrate, when the researchers described the annuity through a consumption frame, they told participants that the choice was a product that enabled the purchasers to spend $650 each month for as long as they live, and when they die there will be no more payments. When the investment frame was used, they told participants that it was an investment that earns $650 each month for as long as they live. They can withdraw only the earnings they receive, not the invested money. When the participants die, the earnings will stop and their investment will be worth nothing.

calculations that even academic researchers find challenging.[9] One must quantify investment, longevity, and health-care cost risk; assess one's capacity and willingness to bear these risks; and think through one's preferences for level, increasing, or decreasing consumption over the course of retirement. Given generally low levels of financial literacy, especially among women (Lusardi and Mitchell 2008), many will fall back on gut feeling. The hypothesis is that households might undervalue annuitized income streams relative to lump sums. The challenge that researchers face is that almost any choice could be consistent with rational optimizing behavior, given some set of preferences. Thus, it is hard to assess whether households are exhibiting behavioral biases.

The literature yields conflicting findings. Although some studies report a willingness to take a lump sum on highly disadvantageous terms (e.g., Warner and Pleeter 2001), others report strong demand for annuitization. For example, Clark, Merrill, and Vanderweide (2014) report that fewer than a third of separating public sector employees under age 50 took the lump-sum option even though it was more advantageous than the annuity. For these public sector employees, lack of financial literacy and the power of inertia appeared to overcome any bias in favor of lump sums.

Nonetheless, some consistent patterns emerge. Households respond rationally to indicators of annuity value that are easy to interpret, such as their health status (Chalmers and Reuter 2012), but show behavioral biases, including being influenced by recent stock market returns (Agnew, Anderson, and Szykman 2015; Chalmers and Reuter 2012) defaults and influences of peer groups (Bütler and Teppa 2007).

Given that few households possess the mathematical skills to determine the optimal choice and even fewer have the level of financial literacy required to specify the problem, I suspect that choices will be highly context specific and that both the choice of default option and the form in which the choice is presented will have a strong influence on the decision made.

THE ROLE OF FINANCIAL LITERACY

The effect of financial literacy on the choice between purchasing an annuity and remaining invested in financial assets is ambiguous. Agnew and Szykman (2011) identify four possible channels: First, if the purchase of an annuity requires less effort than managing an investment portfolio throughout retirement, the less financially literate may prefer the annuity. Second, the financially literate may overestimate their investment skills and prefer the investment option. Third, if the financially literate are more familiar with investments, they may prefer the investment option. Fourth, the more financially literate may understand the value of the longevity insurance provided by annuities and choose the annuity. Although Agnew and Szykman (2011) did not discuss trust in insurance companies, it seems plausible that lack of trust could also be a barrier to annuitization among the less financially literate. Using the same data set as was analyzed in Agnew et al. (2008), Agnew and Szykman (2011) found the less financially literate were more likely to annuitize. From this finding they concluded that one or more of the first three channels were having an effect. They noted a marginally statistically significant relationship between self-reported feelings of emotional overload and annuity purchase that suggested the first channel was having an effect.

I view the results more cautiously. First, we cannot rule out any of the four factors. It is entirely possible that the more financially literate better understand the value of annuities but that this effect is more than offset by one or more of the other factors. Second, given that the annuity game was a game of pure chance, it is not clear why participants should believe that their investment skills should affect the outcome. Third, in this game the annuity was the simpler option. In real life, annuities can appear to be complicated, with the purchaser confronted with a variety of immediate, variable, and deferred products from competing manufacturers. It is not clear whether the authors would obtain the same results if the annuity choice were more complex, for example if households were required to choose between

9. The problem is solved numerically, working back from the last period of the household's life and calculating the optimal strategy in each period, given that the household will also choose the optimal strategy in each subsequent period. With many choices and outcomes, even a simplified model quickly becomes analytically intractable, which necessitates simplification of assumptions

multiple annuity types. Fourth, the game omitted what I suspect could be the most important barrier to annuitization: the tendency of some households to procrastinate. Delaying annuitization for a short period is almost costless; all that is lost is the mortality credits, the excess of the return on an annuity over that on similar unannuitized investments.[10] If the annuitization decision imposes high psychological costs, especially for the financially illiterate, and if the financially illiterate are fearful of making an incorrect choice, it would hardly be surprising if the financially illiterate procrastinated.

As previously mentioned, financial literacy appears to narrow the gap between the prices at which households are willing to purchase and sell the Social Security annuity, a finding the authors of the study attribute to a greater willingness to back their judgment. But research also shows that financial literacy and confidence in one's financial skills are positively associated with participation in the stock market (Cupak et al. 2020). If households mistakenly believe that annuitization precludes participation in the stock market, their financial literacy and confidence in their financial skills might be associated with a reduced willingness to annuitize.

THE ROLE OF COMPLEXITY

Research shows that complexity can adversely affect individuals' ability to value an annuity. In Brown et al. (2021) individuals were asked to advise a hypothetical individual to choose whether to first buy and then sell small tranches of the Social Security annuity.[11] A larger gap between the buy and sell prices indicates greater difficulty in valuing the annuity. The researchers found that additional complexity, achieved by adding extraneous information, increased the buy-sell spread.[12] I see the influence of complexity as more pernicious in that it could induce procrastination, especially among the financially illiterate.

THE ROLE OF RACE/ETHNICITY, AND GENDER

Most of the literature does not specifically study the relationship between race, gender, and behavioral impediments to annuitization. Race/ethnicity and gender are both correlated with financial literacy, with women and Black or Hispanic households having lower levels of financial literacy, lower levels of trust in financial institutions, and less experience with stock market investing. It follows that behavioral barriers to annuitization will be greater for these groups.

CONCLUSIONS

LESSONS FOR FINANCIAL ADVISORS AND PLAN SPONSORS

Financial advisors can draw the following lessons from the research. First, financial advisors can influence decisions simply by how they present information. Advisors have a responsibility not only to give sound advice, but also to avoid unintentional bias. Advisors should remember that wealth accumulation is not an end in itself. The purpose of wealth accumulation is to finance one's own consumption, avoiding an undue drop late in life, and perhaps also to finance the consumption of those to whom one may wish to leave a bequest. Framing wealth accumulation and drawdown over the life cycle as an investment decision can risk losing sight of this goal. Second, studies highlight the deleterious effects of the effort involved in making the annuity purchase decision. Given that the annuitization choice is largely irreversible, has large and lifelong financial consequences, and is a choice with which few purchasers have prior experience, it would not be surprising if even those aware of the benefits of annuitization were to procrastinate. Defaults and simplification can help overcome these barriers.[13] But, in the real world, simple and complex products coexist—401(k) plan participants can

10. Annuities are able to offer a higher return than bonds because money is reallocated from those who die to those who live. The advantage of annuities over bonds increases with age as mortality rates increase.
11. To avoid the results being contaminated by status quo bias, meaning a preference for entitlements even when some alternative might be objectively superior, the tranche was in addition to existing benefits.
12. Brown et al. (2021) show that lower cognitive ability is associated with a higher buy-sell spread.
13. The impact of choice overload may be context-specific. Besedeš et al. (2012) found in a laboratory setting that older adults responded to choice overload not by giving up, but rather by increasing the number of heuristics they bring to the task.

choose life-cycle funds or tailor-made portfolios. The evidence suggests that households have an awareness[14] of their level of financial sophistication and select accordingly (Carvalho and Silverman 2019), so perhaps the lesson is that the message must be tailored to the recipient. Third, most households that possess economically significant financial assets hold most of their financial assets in a retirement account, and plan sponsors can play a key role in promoting annuitization. The employer has a fiduciary obligation toward 401(k) participants; even if the participant does not understand the nature of that obligation, the employer is often seen as a trusted provider of financial advice.

LESSONS FOR POLICYMAKERS

Both financial education and defaults have been shown to be associated with improved outcomes in other contexts. Lusardi and Mitchell (2014) caution against automatic annuitization, pointing out that it could be deleterious for some because of the interaction with means-tested programs. I believe their concerns are exaggerated; in fact, annuities are often an effective means of safeguarding assets from Medicaid. But their broader point is well taken—that defaults will lead to better financial outcomes when households are financially literate, and therefore are in a position to override the default setting knowledgeably.

I am somewhat skeptical of the potential for financial education to promote appropriate use of annuities. The difficulty is that what typically passes for financial education—understanding compound interest, the difference between stocks and bonds, and so on—is disconnected from the annuitization decision, whereas research shows that financial literacy as commonly defined is associated with lower annuitization rates. An alternative to traditional financial education is messaging that stresses the consequences of decisions through the use of vignettes (Samek, Kapteyn, and Gray 2019). Thus, in the annuity vignette the financial advisor explains, "Annuities are like insurance against outliving your money. You pay a premium up front, but then you're guaranteed a monthly payment until you die," but does not actually advise purchase. The vignettes affected what participants would recommend for a hypothetical third party but did not affect their own intentions. But I suspect a one-time exposure to a three-minute vignette is too short and too superficial to undo all the prejudices and misperceptions relating to retirement wealth drawdown.

DIRECTIONS FOR FUTURE RESEARCH

An early paper (Brown 2007) speculated as to possible behavioral impediments to annuitization. Many of these hypotheses have been investigated over the succeeding 14 years. But some promising hypotheses proposed by Brown (2007) have yet to be investigated. Specifically, I am unaware of any research into whether an association by households of insurance with payouts in the event of bad outcomes acts as a barrier to annuitization. The opportunity to procrastinate may also act as a barrier to annuitization, especially for households that both find the intellectual effort in making a decision to be costly and exhibit time-inconsistent preferences.[15] More generally, research is needed on whether the findings of laboratory experiments carry over into real life.

AUTHOR

Anthony Webb is Senior Fellow at the Schwartz Center for Economic Policy Analysis, The New School.

14. I acknowledge that, by retirement, job-hoppers will usually hold most of their retirement wealth not in 401(k)s, but instead in IRAs.
15. A household with time-inconsistent preferences (Laibson 1997) will understand the desirability of making a decision, will commit to making that decision at some point in the future, and, when the time comes, renege on that commitment. Brown and Previtero (2014) offer evidence that procrastinators are less likely to annuitize defined benefit plan balances

REFERENCES

Agnew, Julie R., Lisa R. Anderson, Jeffrey R. Gerlach, and Lisa R. Szykman. 2008. "Who Chooses Annuities? An Experimental Investigation of the Role of Gender, Framing, and Defaults." American Economic Review: Papers and Proceedings 98(2): 418–22.

Agnew, Julie R., Lisa Anderson, and Lisa Szykman. 2015. "An Experimental Study of the Effect of Prior Market Experience on Annuitization and Equity Allocations." Journal of Behavioral Finance 16(2): 120–29.

Agnew, Julie R., and Lisa Szykman. 2011. "Annuities, Financial Literacy and Information Overload" In Financial Literacy: Implications for Retirement Security and the Financial Marketplace, edited by Olivia S. Mitchell and Annamaria Lusardi, 260–97. Oxford, UK: Oxford University Press.

Besedeš, Tibor, Cary Deck, Sudipta Sarangi, and Mikhael Shor. 2012. "Decision-Making Strategies and Performance among Seniors." Journal of Economic Behavior and Organization 81: 524–33.

Beshears, John, James J. Choi, David Laibson, Brigitte C. Madrian, and Stephen P. Zeldes. 2014. "What Makes Annuitization More Appealing?" Journal of Public Economics 116(C): 2–16.

Brown, Jeffrey R. 2007. "Rational and Behavioral Perspectives on the Role of Annuities in Retirement Planning." Working Paper 13537, National Bureau of Economic Research, Cambridge, MA.

Brown, Jeffrey R. Arie Kapteyn, Erzo F.P. Luttmer, Olivia S. Mitchell, and Anya Samek. 2021 "Behavioral Impediments to Valuing Annuities: Evidence on the Effects of Complexity and Choice Bracketing." *Review of Economics and Statistics* 103 (3): 533–46.

Brown, Jeffrey R., Arie Kapteyn, and Olivia S. Mitchell. 2016. "Framing and Claiming: How Information Framing Affects Expected Social Security Claiming Behavior." *Journal of Risk and Insurance* 83(1): 139–62.

Brown, Jeffrey R., Jeffrey R. Kling, Sendhil Mullainathan, and Marian V. Wrobel. 2008. "Why Don't People Insure Late Life Consumption? A Framing Explanation of the Under Annuitization Puzzle." *American Economic Review* 98(2): 304–9.

<3M>. 2013. "Framing Lifetime Income." *Journal of Retirement* 1(1): 27–37.

Brown, Jeffrey R., and Alessandro Previtero. 2014. "Procrastination, Present-Biased Preferences, and Financial Behaviors." Working Paper NB14-04, Retirement Research Consortium, Washington, DC.

Bütler, Monika, and Federica Teppa. 2007. "The Choice between an Annuity and a Lump Sum: Results from Swiss Pension Funds." *Journal of Public Economics* 91(10): 1944–66.

Carvalho, Leandro, and Dan Silverman. 2019. "Complexity and Sophistication." Working Paper 26036, National Bureau of Economic Research, Cambridge, MA.

Chalmers, John, and Jonathan Reuter. 2012. "How Do Retirees Value Life Annuities? Evidence from Public Employees." *Review of Financial Studies* 25(8): 2601–34.

Clark, Robert L., Melinda S. Merrill, and David Vanderweide. 2014. "Defined Benefit Plan Distribution Decisions by Public Sector Employees." *Journal of Public Economics* 116(Aug.): 73–88.

Cupak, Andrej, Pirmin Fessler, Joanne, W. Hsu, and Piotr R. Paradowski. 2020. "Confidence, Financial Literacy, and Investment in Risky Assets: Evidence from the Survey of Consumer Finances." Working Paper, Federal Reserve Board, Washington, DC.

Gazzale, Robert, Sandy Mackenzie, and Lina Walker. 2012. "Do Default and Longevity Annuities Improve Annuity Take-Up Rates? Results from an Experiment." AARP Public Policy Institute, Washington, DC.

Gong, Guan, and Anthony Webb. 2008. "Mortality Heterogeneity and the Distributional Consequences of Mandatory Annuitization." *Journal of Risk and Insurance* 75(4): 1055–79.

Laibson, David. 1997. "Golden Eggs and Hyperbolic Discounting." *Quarterly Journal of Economics* 112(2): 443–77.

Lusardi, Anamaria, and Olivia S. Mitchell. 2008. "Planning and Financial Literacy: How Do Women Fare?" *American Economic Review* 98(2): 413–17.

<3M>. 2014. "The Economic Importance of Financial Literacy" Theory and Evidence." Journal of Economic Literature 52(1): 347–66.

Mitchell, Olivia, James Poterba, Mark J. Warshawsky, and Jeffrey J. Brown. 1999. "New Evidence on the Money's Worth of Individual Annuities." *American Economic Review* 89(5): 1299–318.

Samek, Anya, Arie Kapteyn, and Andre Gray. 2019. "Using Vignettes to Improve Understanding of Social Security and Annuities." Working Paper 26176, National Bureau of Economic Research, Cambridge, MA.

Warner John, T., and Saul Pleeter. 2001. "The Personal Discount Rate: Evidence from Military Downsizing Programs." *American Economic Review* 91(1): 33–53.