

Numeracy and Medicare Part D: The Importance of Choice and Literacy for Numbers in Optimizing Decision Making for Medicare's Prescription Drug Program

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Studies on decision making have come to challenge the idea that having more choice is necessarily better. The Medicare prescription drug program (Part D) has been designed to maximize choice for the consumer but has simultaneously created a highly complex decision task with dozens of options. In this study, in a sample of 121 adults, we examined the impact that increasing choice options has on decision-making abilities in older versus younger adults. Consistent with our hypotheses, we found that participants performed better with less choice versus more choice, and that older adults performed worse than younger adults across conditions. We further examined the role that numeracy may play in making these decisions and the role of more traditional cognitive variables such as working memory, executive functioning, intelligence, and education. Finally, we examined how personality style may interact with cognitive variables and age in decision making. Regression analysis revealed that numeracy is related to performance across the lifespan. When controlling for additional measures of cognitive ability, we found that although age was no longer associated with performance, numeracy remained significant. In terms of decision style, personality characteristics were not related to performance. Our results add to the mounting evidence for the critical role of numeracy in decision making across decision domains and across the lifespan.

Keywords: decision making, health policy

In January 2006, a new prescription drug program for older adults, known as Medicare Part D, was introduced. Representing the most significant health policy change since the inception of Medicare in the mid-1960s, the Medicare Part D program offers

older adults the option of purchasing subsidized prescription drug coverage. Unlike other components of Medicare that are administered by the federal government, Part D is administered through dozens of private insurance companies. As a consequence, Medicare Part D provides an interesting, real-world problem for studying complex decision making in older adults. Indeed, a range of health care professionals have judged the program as too complicated (Kaiser Family Foundation, 2006), and it has drawn criticism over its complex design (Hanoch & Rice, 2006a). Given that enrollees in most states have approximately 50 different drug plans to choose from (Kaiser Family Foundation, 2009), choosing the best plan for them could save them hundreds or even thousands of dollars per year (Gruber, 2009). Millions of Medicare beneficiaries thus have strong incentives to make the best personal choice. The goal of our current program of research was threefold. First, we were interested in whether the number of choices affects the ability of adults to comprehend information and to correctly answer factual questions about plan features. Second, we wanted to assess whether older adults performed more poorly on these tasks relative

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to younger adults. Finally, we were interested in examining potential mediators of the decision process across the lifespan including the role of numeracy, cognitive variables, and individual differences in personality on decision quality.

Choice and Decision-Making

Work with younger populations has demonstrated that less choice can be more satisfying and lead to better performance. In a series of laboratory and field studies, Iyengar and colleagues (Iyengar, Wells, & Schwartz, 2006) show that people feel less satisfaction, a greater sense of regret, and exhibit lower decision quality when choosing from a larger compared to a smaller choice set. Sethi-Iyengar, Huberman, and Jiang (2004), likewise found that offering a larger choice of 401(k) retirement plans reduced the number of individuals who participated in one of the programs, and that having more job offers can lead to lower job satisfaction (Iyengar, Wells, & Schwartz, 2006). To our knowledge, a few studies have examined the relationship between choice size and decision making among older and younger adults (Hanoch, Rice, Cummings, & Wood, 2009; Reed, Mikels, & Simon, 2008; Tanius, Wood, Hanoch, & Rice, 2009). Those that have been completed suggest that older adults prefer less choice and perform better with fewer options. Similarly, few studies have examined the role of increasing choice in relationship to an objective measure. That is, earlier studies have focused on the relationship between choice size and subjective measures, such as motivation and satisfaction (Iyengar, Wells, & Schwartz, 2006). While previous research has set the tone, it is as vital to extend this line of investigation to include more objective measures. For example, it is possible that increasing choice size not only reduces satisfaction but increases out of pocket expenses. In fact, the two might be intimately related: an increasing sense of regret might be a direct consequence of realizing that a better item exists. Thus, our study extends earlier work by manipulating the number of options to examine how an increase in the number of choices affects objective performance across the lifespan in light of other variables discussed below.

Aging and Medical Decision-Making

There is evidence that age is associated with poorer performance on medical decision-making tasks. Hibbard, Slovic, Peters, Finucane, and Tusler (2001) examined decision making in the financial and medical domain by looking at younger and older adults' understanding of health care plans. Older individuals were found to be three times more likely to make errors on tasks than younger adults (9 percent and 25 percent, respectively). In another study, Finucane, Mertz, Slovic, & Schmidt (2005) investigated the relationship between age and competence by increasing task complexity of health, financial, and nutritional information, focusing on personal variables that may affect decision-making competence. Individuals performed significantly better on simple rather than complex tasks and made more comprehension errors as complexity increased. At the same time, no significant age-by-complexity interaction with this task was found. Processing speed accounted for a significant amount of the variance on this set of tasks, as assessed by a digits comparison task. Based on the above research,

we predict a main effect for age on the Medicare Part D task, with older adults performing worse.

Role of Numeracy in Decision-Making and Aging

In one review, Reyna, Nelson, Han, & Diekman (2009) have provided comprehensive and insightful data about numeracy. Their work highlights a number of issues with regard to numeracy. First, a number of definitions exist. Second, a range of measures are available to study numeracy skills. As with other instruments, not a single one seems to triumph over others. One measure that has been used in a range of medical decision making is the one by Lipkus and colleagues (Lipkus, Samsa, & Rimer, 2001). Our decision to use this instrument was based largely on two factors. First, the instrument has been widely used among other studies evaluating comprehension of health insurance (Peters, Diekman, Dixon, Hibbard, & Mertz, 2007; Hibbard, Peters, Dixon, & Tusler, 2007). Second, it has been extensively used to compare numeracy abilities between young and older adults (Galesic, Gigerenzer, & Straubinger, 2009; Peters, Slovic, Västfjäll, & Mertz, 2008).

The topic of numeric ability—usually defined as the ability to understand basic mathematical concepts (Schwartz, Woloshin, Black, & Welch, 1997) and aging has received some attention in recent years, notably as health authorities have come to recognize that health numeracy is essential to successfully navigating the health care system, adequately evaluating medical information, and making sound medical decisions (e.g., U.S. Department of Health and Human Services, 2000). Findings from the Seattle Longitudinal Study (Schaie, 1993) indicate that numeric ability demonstrates a hyperbolic function, with a peak in midlife and declines beginning in the 60's. There are some notable cohort differences, with older cohorts demonstrating stronger numeric abilities than younger cohorts, but over time, performance on tasks of numeric ability decreases as age increases within each cohort. In these studies, numeric abilities are typically assessed by asking participants to make simple calculations. Existing research on the related concept of numeracy across the lifespan suggests that older adults as a group evidence lower levels of numeracy than younger groups (Peters, Hibbard, Slovic, & Dieckmann, 2007; Banks & Oldfield, 2007; Tanius, Wood, Hanoch, & Rice, 2009). As such, the current design of Medicare Part D may place older adults in a decision environment that exploits their weaknesses rather than their strengths in crystallized knowledge. Indeed, while Reyna et al. (2009) have identified numeracy skills as one factor that might have impeded older adults' abilities to make good choices, we know of no earlier study that has investigated this idea.

Factors such as mathematical ability might play a critical role in explaining age difference in choice performance that requires the processing of numeric information. Peters et al. (2006; 2007) argue that numeracy levels, or literacy for numbers, are correlated with decision quality, such that low (vs. highly) numerate people are more "influenced by competing, irrelevant affective considerations" (Peters et al., 2006; p. 407). Indeed, numeracy levels have been shown to be strongly related to the capacity to comprehend and evaluate health insurance plans (Hibbard, Jewett, Engelmann, & Tusler, 1998) and to making medical decisions (Woloshin, Schwartz, Black, & Welch, 1999). Moreover, Hibbard, Peters, Dixon, & Tusler (2007) have shown that numeracy levels are the