

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES

Issue: *Decision Making Over the Life Span***Aging and consumer decision making**

Stephanie M. Carpenter and Carolyn Yoon

University of Michigan, Ann Arbor, Michigan

Address for correspondence: Carolyn Yoon, University of Michigan, Ross School of Business, 701 Tappan St., Ann Arbor, MI 48109. yoonc@umich.edu

Research on consumer decision making and aging is especially important for fostering a better understanding of ways to maintain consumer satisfaction and high decision quality across the life span. We provide a review of extant research on the effects of normal aging on cognition and decision processes and how these age-related processes are influenced by task environment, meaningfulness of the task, and consumer expertise. We consider how research centered on these topics generates insights about changes in consumption decisions that occur with aging and identify a number of gaps and directions for future research.

Keywords: aging; decision making; consumers

Introduction

The number of individuals over the age of 65 continues to grow dramatically and is projected to increase to 72 million (or over 20% of the U.S. population) by 2030 (U.S. Census Bureau). A better understanding of how consumer decision making changes across the life span is thus increasingly more relevant to older people themselves, as well as to their families, to businesses, and to public policy makers. Accordingly, investigations of age-related changes in decision-making processes employed across a variety of consumption domains constitute a vital area of study. Despite the clear importance of such studies for understanding the aging process and developing better ways to serve older consumers, research on aging and consumer decision making has been relatively limited.

In this paper, we provide a review of findings from extant literatures on consumer behavior, psychology, and decision making that inform our present understanding of older consumers' decision making. We begin by discussing the effects of normal aging on cognition and decision processes. We then focus on how aging effects are influenced by several key factors: task environment or context, meaningfulness or personal relevance of the task, and consumer expertise. We conclude by identifying current gaps in knowledge and suggesting directions for future research.

Effects of age on cognition and decision processes

Aging generally leads to systematic declines in cognitive processing. Evidence suggests that age-related declines in working memory and executive functioning begin as early as the mid-20s and grow steeper as people advance into their 70s.¹ In particular, speed of processing, which is assessed by how quickly one is able to conduct mental operations, such as pattern matching, shows reliable declines with age.² Speed of processing is frequently correlated with working memory capacity, and research also suggests that many age-related differences in cognitive processing are attributable to declines in processing speed.²

Cognition and memory

Different types of memory processes are influenced in different ways, with working memory being more sensitive to cognitive decline than long-term memory, and explicit memory processes (i.e., memory for information that people consciously intend to recollect, such as information recall) being more affected than implicit (i.e., nonconscious) memory processes.^{3,4} Research has shown that working memory is particularly vulnerable to aging effects, such that tasks that rely heavily on working memory exhibit the greatest age-related performance declines.⁵ Diminished working memory may be

especially problematic when older decision makers need to compare a number of alternatives.^{6,7} Similarly, age-related impairments in general executive functioning, such as the ability to shift between task goals, update the contents of working memory, and inhibit irrelevant information, can pose difficulties for decision making.^{8,9}

The robust declines in explicit memory observed across the life span¹⁰ include worse source memory (e.g., for physical setting, specific context, speaker^{11,12}) and greater difficulty in locating relevant information in complex contexts¹³ among older adults. By contrast, long-term semantic memory, which is associated with general knowledge, and is not tied to episodic events, is relatively resistant to the effects of aging.⁴

Systematic versus heuristic decision-making strategies

Research on decision making has frequently focused on the types of strategies, including cognitive heuristics and biases, used by individuals when making decisions.¹⁴ Prior research suggests that there may be changes in the use of decision strategies as people age; in particular, older adults may be more likely to use heuristic or biased strategies in their decision making than younger adults.¹⁵

Older adults have also been shown to exhibit more “satisficing” tendencies (which aim at adequate rather than maximum satisfaction) than younger adults.^{16–18} For example, older adults examine information about an option only until they deem the amount of information sufficient and therefore acceptable. This satisficing strategy can be considered a more heuristic form of decision making, in contrast to maximizing utility, which relies on systematic and deliberative processing.¹⁹ Satisficing may thus be adopted as a decision strategy by older adults in order to decrease the amount of effort required during tasks involving more elaborate forms of cognitive processing.

The notion that older adults rely more on heuristics than younger adults is also supported by suggestions that decision modes and susceptibility to biases (e.g., overconfidence) may change over the adult life span. For instance, older adults rely more on cognitive biases that allow them to make a decision quickly and efficiently.²⁰ Such reliance on heuristics may be adaptive in daily situations where quickly choosing an appealing product contributes to greater satisfac-

tion with the consumption decision (e.g., grocery purchases). However, it can also be a detriment in situations when systematic processing of information is much more important, such as for health care or financial decisions in which a large amount of complicated information may need to be considered in order to make the best decision.

Although older adults tend to rely more on schema-based or heuristic processing than their younger counterparts, and will do so spontaneously when the presentation of information is framed more heuristically, they can be induced to take a more systematic approach to decision making in some situations, for instance, when they are asked to consider the reasons for their decisions.¹⁵

Older adults are also better able to process information systematically under certain conditions. For example, older consumers are able to engage in detailed processing of information during their peak times of day.²¹ Specifically, individual differences in circadian arousal patterns have been found to influence memory and decision-making performance across the life span.^{21,22} Peak circadian arousal tends to occur at different, yet predictable, times of day for older and younger adults. Older adults tend to reach this level of circadian arousal, and thus peak performance, in the morning, whereas younger adults tend to reach it in the afternoon or evening.^{21,22} It may, therefore, be adaptive for older adults to engage in complex tasks that require more detailed or elaborate information processing in the morning, and for younger adults to engage in similar tasks later in the day. This also suggests that comparisons of performance between younger and older adult populations may need to account for time of day.

Decision contexts in which older consumers are encouraged to elaborate on the task at hand have been found to reduce the negative effects of aging on cognition. When instructed to form a mental image of brand claims, older adults exhibited improved ability to process detail.²³ The benefits of mental imagery on detailed processing seem to be above and beyond the benefits that result from instructing older consumers to justify their decisions¹⁵ or to think deeply about the information while making their decisions.⁷ These findings suggest that providing older adults with cues to engage in imagery may be an effective method for inducing more systematic processing in decision situations that call for careful deliberation and analytical thinking.

Choice and decision-making processes

How older adults make choices and construct their choice options is of importance to understanding consumer decision making. Older adults have been shown to prefer purchasing brands that have been established for a long time.²⁴ This is likely due to a number of factors, including experience with products, attachment to products, nostalgia, habit, and possible aversion to change.²⁵

The number of options available in one's choice context is also an important consideration for older adults' decision making.²⁵ Within the context of health decisions, a number of studies have recently examined the consequences of the Medicare prescription drug program (Part D).^{26–28} The Medicare Part D program was created with the intention of maximizing the number of prescription drug choices that would be available to older adults. Research has shown, however, that participants make better decisions with fewer choice options, and that this effect is particularly prominent in older adults.²⁷ Further, Abaluck and Gruber²⁶ indicated that older adults tend to focus specifically on a narrow range of dimensions, and that a better way to present medical information may be to restrict the choice set size to a few options with the lowest average costs. In general, prior studies suggest that older consumers should be presented with fewer choice options (assuming the choice options are acceptable along dimensions of importance to older adults) and that choice information presented in simpler formats leads to improvements in their decision performance.

Searching for new information is a cognitively taxing process, and older adults tend to engage in less of it when making decisions. When making consumption decisions, older adults tend to construct smaller consideration sets,²⁴ which is a direct result of their limited time spent searching for brand information.²⁹ This reduction in consideration set size is posited to be the result of a "shrinkage" effect, whereby the decrease in information searched for and obtained also leads to the consideration of fewer options.²⁵ Additional evidence from a political domain suggests that older adults engage in noncompensatory choice strategies whereby they eliminate alternatives immediately following the presentation of negative information about the alternatives.³⁰ Other research indicates that older adults are more likely to engage in repeat purchasing, especially if their consideration sets are smaller.²⁴

When comparing relatively complex options involving many kinds of information, such as decisions related to apartments, health care plans, or cars, older adults have been found to be more feature oriented, while younger adults are more option oriented.³¹ In this case, the tendency of older adults to reduce options and reduce the cognitive effort involved in a decision may translate into a greater focus on the essentials of the decision, that is, experiential benefits offered by the features.

Research on decision competence across the life span further supports the notion that simpler decisions, such as those made among options comprising fewer attributes, improve older adult decision making.³² Examining performance on a number of real world decision tasks, including health, financial, and nutrition decisions, Finucane *et al.*³² suggest that with greater age and task complexity, older adults are more inconsistent in their decisions and make a greater number of comprehension errors.

Moderating influences on aging and decision making

Age-related changes in cognition and decision processes can be influenced by a variety of factors. We review three broad sets of such factors. First, the task environment or context can have a profound effect on older consumers. Whereas a difficult task environment can be particularly challenging for older consumers, support in the form of environmental cues or decision aids can serve to bolster task performance that leads to more effective decisions. Second, the meaningfulness or personal relevance of the task can aid older consumers insofar as they are inherently more interested in the task domain and motivated to make appropriate decisions. Third, consumer expertise can potentially buffer the effects of age and facilitate effective decision making, although there are some pitfalls associated with overreliance on experience and familiarity. We now turn to a discussion of each of these factors.

Task environment or context

The environment in which a decision is made often has important implications for how satisfactory or unsatisfactory the outcome is perceived to be by the older decision maker.⁴ In particular, time pressure, distraction, irrelevant information, and environmental support or decision aids can have an influence on older adults' decision making. Some of

these task factors may have detrimental effects, while others may serve to enhance decision performance.

Time pressure

Presence of time pressure in a decision environment has been found to have a detrimental influence on the decision making abilities of consumers, particularly as they age.^{33,34} For example, consumers under time pressure, especially if they are in unfamiliar settings, are less likely to be able to locate their preferred brand and end up purchasing brands they did not intend to purchase.³⁴ Further, time pressure has also been shown to magnify decrements in recall by older adults, as compared to younger adults. A potential explanation that has been offered to account for this difference in older adults is that time pressure activates negative stereotypes about aging, resulting in increased anxiety.³³

Distraction and irrelevant information

Prior findings have documented robust age-related increases in vulnerability to distraction across a variety of tasks.³⁵ For example, older adults report difficulty in locating an object in a cluttered visual field,³⁶ have slower responses, and commit more errors in search tasks when larger numbers of distracters are present in the selection environment.^{37,38} In previous studies of divided attention, age differences in dual-task performance have also been typically found, especially with increases in difficulty of the constituent tasks.

Environmental primes, or information automatically activated by environmental context, may be especially relevant when considering decisions that older adults encounter in daily life. Older adults are more susceptible than younger adults to the disruptive effects of distraction from task-irrelevant sources, which can include events from the recent past.³⁹ This is due to a general inability of older adults to inhibit irrelevant environmental primes. Diminished inhibitory control by older adults means that irrelevant information remains active in their memory when engaging in subsequent unrelated tasks. It has been shown that this inhibitory deficit among older adults can hurt their immediate task performance, as well as their downstream performance for up to 15 to 20 minutes after initial exposure to the distraction.³⁹

However, emerging evidence suggests that older adults' greater sustained activation of irrelevant past information may also lead to positive downstream

consequences. For example, Kim, Hasher, and Zacks⁴⁰ reported superior performance by older adults compared to younger adults on a Remote Associates Task (RAT) after exposure to distracting information on a preceding task.⁴¹ Samanez-Larkin, Wagner, and Knutson⁴² also found that distracting tasks may have less of an influence when the critical information is presented in a simplified format; providing simple expected value information for financial decisions improved older adults' decision quality, even when a distracter task was presented. Hence, future research is needed to further examine how distraction and inhibitory failures lead to performance costs as well as benefits for older adults in consumption domains.

Decision aids

Decision aiding is another important topic frequently discussed within the decision-making literature, although the extent to which decision aids can help older consumers has not received adequate research attention. Decision aids for older adults can take several forms, including simply writing down information,⁴³ crossing out irrelevant information from preexisting lists of information,¹³ or using visual symbols to supplement information.⁴⁴ The limited empirical evidence regarding this topic suggests that older adults with higher (versus lower) crystallized and fluid intelligence make greater overall use of aids.⁴⁵ Further, memory aids are used more toward the middle of a decision-making process by younger adults, and toward the end, just prior to the decision, by older adults. Such findings highlight the importance of providing decision makers with memory aids during stages of the decision-making process that maximize the likelihood they will be used.

Cole and Balasubramanian⁴³ found that older consumers did not search nutritional information as intensively as younger consumers when shopping for cereal in a grocery store setting and subsequently chose less appropriate cereals. However, when study participants were encouraged to write down information acquired during the search process, age-related differences disappeared. Writing information down is an important decision aid for older adults.

Meaningfulness or personal relevance

Meaningfulness or personal relevance of a decision is another important factor that can moderate the

effects of age on consumer decision making. In particular, there is evidence to support the notion that older adults are more focused on affective and value-based information than younger adults.^{46,47} Consistent with this, a greater reliance on affective, experiential, and heuristic forms of processing has been well documented to occur as people age.⁴⁸

Deliberative and affective processing

Decision making literature has largely relied on a strong assumption that deliberative processing abilities are of utmost importance to good decision making,¹⁸ and predictable declines in deliberative processing have been found to occur with age, largely due to declines in cognitive functioning.⁴⁹ This is thought to influence overall decision quality. Older adults rely more on affect than deliberation when making choices⁵⁰ and focus on information that has personal meaning. This is exemplified by older adults' ability to process information presented in a numeric format. Numeracy, which is a measure of one's ability to understand and use numerical information,⁵⁰ shows predictable patterns whereby individuals who are high in numeracy pay more attention to and derive more meaning from information presented in a numeric format, as compared to those lower in numeracy.

One study described by Peters⁵⁰ indicated that older adults who were low in numeracy were the most unlikely, as compared to high numerate older adults and to all younger adults, to report their intent to consume a prescription medication when the information for the prescription was presented numerically, as opposed to nonnumerically. The observed reduction in willingness to consume the prescription was interpreted as reflecting decreases in deliberative processing associated with aging, which likely made it more difficult for the low numerate older adults to process the numeric information. Research examining the Medicare Part D plan decisions have also suggested that numeracy is related to decision performance across the life span:²⁷ when controlling for cognitive ability, numeracy was more predictive of decision performance than age.²⁸ These findings may highlight one particular type of deliberation where certain (i.e., low numerate) older adults show lower decision quality.

Research on use of the "affect heuristic" is of relevance to the study of consumer decision making and aging.⁴⁸ The theory underlying the affect heuristic

is that representations of objects and events are tagged with affect to varying degrees for each individual. In the process of making either a judgment or decision, people have a tendency to consult or refer to their general affect pool, which contains all positive or negative tags. These tags can be either conscious or unconscious, and can serve as a cue to the decision maker as to how they feel about the target objects and decision problem. As older adults are more likely to rely on affective processing, one might expect that they would also be more likely to use strategies like the affect heuristic to guide their decisions and simplify the decision process.⁴⁸

Despite challenges to good decision making due to declines in deliberative processing, older adults have been found to rely on a number of strategies to maintain high levels of decision quality.⁵⁰ Admittedly, there are circumstances in which the greater reliance of older adults on affect when making choices leads to consequences that may not be positive. For example, older adults may be especially susceptible to affective appeals in advertising and marketing campaigns that do not provide any useful information, or are deceptive and increase the likelihood that older adults will fall victim to scams. However, this reliance on affect can lead to a number of positive outcomes for older adults as well.

A greater reliance on affect can help older adults make better decisions in the face of declining deliberative processing when affect is sufficiently complemented by cognitive information, such as knowing the reasons for a decision.⁵⁰ These findings about age-related shifts toward affective processing provide potential guidelines for conveying information to an older population. Presenting information in more emotion-focused contexts has been found to benefit performance on certain types of information processing tasks. Research on changes in working memory ability across the life span suggests that, despite declines in working memory among older adults, working memory for emotional information remains selectively unimpaired.⁵¹

Mikels *et al.*⁵¹ examined whether framing health care information as more informational versus affective would have a differential influence on consumption choices across the life span. Younger and older adult participants were asked to make health care choices that required they hold in mind and consider a range of information related

to the choice options. Participants were given instructions that were either an information-focused or emotion-focused condition, or received no instructions (control condition). Participants with information-focused instructions were asked to remember the details about each option, while participants with emotion-focused instructions were told to form a general affective impression of each option. Results indicated that younger adults had higher decision quality when given information-focused task instructions (e.g., deliberative condition), while older adults had higher decision quality when given emotion-focused instructions (e.g., affective condition). These findings suggest that one potentially useful way to frame product and service information for older adults is to provide content in a format that encourages more general affective impressions of options, as opposed to one that encourages individuals to remember specific option details.

Shifting of social and emotional goals

The observed shifts in focus from deliberative to affective modes of processing across the adult life span is corroborated by evidence that maturation brings about a shift from more deliberative-focused to more emotion-focused goals—a shift that affects the way in which older adults focus their attention and direct their goals. The socioemotional selectivity theory of aging posits that older adults focus on emotion regulation strategies that enhance positive emotion goals by directing their attention away from negative stimuli (e.g., image of a snake), and focusing on positive stimuli (e.g., image of a butterfly).^{52–54} This selective attention, however, may not occur in situations where older adults feel threatened or do not have the time to act consistently with motivational goals.^{55,56}

Older adults' memory for information also tends to skew more positive than that of younger adults (a phenomenon referred to as the “positivity effect” or “bias”) who typically show a greater skew away from positivity and toward a negativity bias.⁵⁴ Interestingly, the positivity bias is also associated with higher cognitive functioning, such that individuals with greater declines in cognitive functioning exhibit much less of the positivity bias.⁵⁵ Evidence suggests that the positivity bias in memory may be driven by cognitive control (e.g., emotion regulation) processing that happens during the encod-

ing of information, and thus may occur primarily among high-functioning older adults.⁵⁵ Among younger adults, the bias for negative over positive information does not seem to be as dependent on changes in resource-demanding processes, which have not yet undergone normative declines with age.

One frequent explanation for the change in emotion goals across the life span is that it is due to a change in one's awareness of the temporal horizon.⁵² Carstensen *et al.* posited that individuals unconsciously assess time as either limited or expansive and that this has consequences for goals. When time is viewed as limited, people tend to be present oriented, finding satisfaction in the moment, and they subsequently devote greater attention to social connectedness, feeling states, and the emotional meaning derived from experiences. Conversely, when time is perceived to be expansive, individuals tend to be future oriented, paying greater attention to planning, analytical thinking, and the pursuit of knowledge, so as to be prepared for future challenges.

Younger adults have been found to perceive the future as more expansive and thus to focus on competition and long-term achievement goals. This future-orientation may be accompanied by a more acute focus on potentially threatening information. Older adults, on the other hand, are less concerned with the future and competitive goals and instead focus on personal meaning, the importance of spending time with family, and having positive life experiences.

The influence of temporal horizon and emotion goals has been investigated in studies on information-processing responses to advertising across the adult life span. Older adults focused more on emotionally meaningful information and goals⁵⁷ and subsequently responded more positively to affective advertising appeals than younger cohorts.⁵⁸ Older consumers also showed greater liking for and increased recall of information presented in emotional advertisements, and the time horizon perspective moderated these age-related differences. Further, advertisements that were focused on avoiding negative emotions were liked and recalled more among older consumers as well as younger consumers who were induced to have a limited time horizon perspective. These findings highlight how temporal horizon perspective can be induced to alter the common positivity and

negativity biases exhibited by older and younger adults, respectively.

Observed changes in social networks across the life span can also help explain changing emotion goals, since older adults tend to have smaller, yet more selective and closer, social networks.^{52,56} Cohen and Wills⁵⁹ suggested that positive social networks lead to greater daily well-being, while Fratiglioni⁶⁰ and Hughes⁶¹ found that positive and satisfying social networks may slow age-related cognitive declines.

Consumer satisfaction across the life span

A recent examination by Yoon, Feinberg, and Schwarz¹⁷ of cross-sectional data from the American Consumer Satisfaction Index (ACSI⁶²) revealed a phenomenon referred to as the “older-and-more satisfied” effect. The ACSI is a database containing information on consumer satisfaction with products and services representing more than 200 companies in 45 industries and some government agencies. In this report, older adults (aged 65 and above) reported higher satisfaction across a variety of product and service categories.¹⁷ The reasons for this robust phenomenon are currently not well understood and are likely to be multicausal. The authors speculated a number of potential explanations, including older consumers’ extensive experience with products and services, which led to a better sense of their own preferences; use of a lower comparison standard than younger consumers who may know more about the “latest and greatest” products; and a greater likelihood to satisfice than younger consumers as long as a product or service meets their basic requirements.¹⁷ A better understanding of why this older-and-more-satisfied effect occurs would help to extend knowledge on consumer decision making and aging.

Consumer expertise

Consumer expertise is a function of both familiarity (or repeated experience) with a decision domain and increasing objective knowledge or skill.⁶³ After a long life’s experience and acquisition of more knowledge, an older adult may be viewed as having gained greater expertise in decisions involving healthcare, financial, and consumer domains. Expertise is thus an important factor to consider in understanding decision making across the life span.

Older consumers are unlikely to experience difficulties making decisions involving mundane tasks

that are highly familiar (e.g., shopping in a favorite grocery store). Familiarity often serves to facilitate ease of processing among older consumers. In general, information that is experienced repeatedly is easier to perceive, recognize, learn, and remember than unfamiliar information. Accordingly, variables that facilitate easy processing of consumer information—such as print fonts, lay-outs, and color contrast—may have a profound influence on recipients’ willingness to adopt a behavioral recommendation. This association between ease of processing and perceived familiarity has many important consequences. For instance, information that is more familiar is also more likely to be accepted as true. Numerous studies have found that repeating the same statement reliably increases its perceived truth.^{64,65} This “illusion of truth” effect is particularly pronounced among older adults,²³ and the reliance on familiarity to infer truth can lead to negative consequences. For instance, being repeatedly exposed to a false health claim can lead to misremembering that false claim as true later on.⁶⁶

Although expertise can lead to negative consequences,^{67–69} it has many benefits for decision making. Experts are often confident about their ability to make choices and find information, and this confidence may foster individuals’ feelings of self-efficacy and prompt actions or decisions.⁷⁰ Increased expertise also facilitates effective decision making, as it makes consumers more efficient in information search and learning.^{71,72} In this section, we further consider the effects of expertise on older adults’ decision making by reviewing studies in financial, health, and consumer domains.

Financial decisions

Research on older adult financial decision making has suggested interactions between the benefits of experience and the costs of aging on older adults’ abilities to make investment decisions.⁷³ Results indicated that older and more experienced investors were more likely to employ useful “rule of thumb” strategies that seemingly highlighted the importance of experience in making investment decisions. However, older adults generally, and especially those of lower socioeconomic status, lower education, or who belonged to minority groups, were less able to apply their knowledge and experience to actual investment decisions. These results suggested that the

effects of aging actually overshadowed any benefits of experience for those groups.

Predictable declines have also been shown for older adults' borrowing decisions, such as for credit card decisions. Agarwal *et al.*⁷⁴ revealed that "financial sophistication" (i.e., the tendency to borrow at lower interest rates and pay fewer fees) increases from young adulthood to middle-aged consumers. This propensity to make good financial decisions peaks at approximately age 53, and then declines into older adulthood. Older adults' abilities to make financial decisions, however, can improve if their experience and knowledge is supplemented with useful information. Recent evidence suggests that providing older adults with simpler information about expected value improves risky financial decisions and yields decision making performance levels similar to that of younger adults.⁴² The implications of these financial studies suggest that although older adults have more experience with financial decisions than their younger counterparts, due to age-related declines in cognitive functioning, the quality of unaided financial decision making still shows declines with aging.

Health decisions

Older consumers face many complex decisions surrounding health. These decisions are often characterized by multiple options, abundant information, high risk, recent innovations, uncertainty, and consequential outcomes. Prior research on aging and health-related decisions has commonly suggested that older adults are vulnerable consumers and decision makers because of cognitive, social, and financial concerns that compromise their abilities to navigate complex choices and abundant information. However, extant research on health and medical decision making has also identified a more proactive and agentic view of aging consumers. Aging patients report that they want to be active participants in medical decision making and desire more information in making those decisions.⁷⁵ Lumpkin and Festervand⁷⁶ found that older adults used more independent and marketer-supplied information than younger adults, and Boscarino⁷⁷ observed that older decision makers relied more on informal information sources. These findings appear contradictory to the earlier described research suggesting that older adults search for less information and construct smaller consideration sets than younger

adults.^{24,25,29} Hence future research is needed to examine which decision contexts lead to more or less information search among older adults, and when greater information search may be beneficial and lead to higher decision quality. The expertise that an individual has with a decision domain may reflect one such context.

To the extent that older adults have greater expertise in healthcare domains, they are also more likely to experience increased benefits and decreased costs of search. Löckenhoff and Carstensen⁷⁸ used emotion- versus information-focused instructions to examine the conditions under which older adults recall a greater proportion of positive than negative information about physicians and health care plans, as compared to younger adults. Results indicated that increasing one's motivation to engage in information search, or controlling for time perspective horizon, led to reductions in age differences in information search and memory for health information. This suggests that differences in information search tendencies and memory for health information in older, as compared to younger, adults are greatly influenced by the goals activated at the time of information search. Such findings lend support to the notion that, in many decision situations, including those involving health care, greater expertise with the domain in question allows older adults to engage in useful and adaptive decision making strategies.

Consumer decisions

Which decision strategies are adopted across the life span is also critical to good consumer decision making. Although cognitive declines can have detrimental effects on decision quality, as depicted in the realm of financial decision making, older adults are capable of adaptively selecting strategies that improve their consumption decisions. The experience that older adults acquire over the years and the prior knowledge that they bring to these decisions may, in and of itself, serve as an adaptation to declines in deliberative and cognitive functioning. In particular, it has been shown that older adults are able to remember the prices of products sold within a grocery store as well as younger adults, due to their extensive experience and familiarity with grocery shopping contexts.⁷⁹ Such experience effects likely play a large role in helping older adults make successful and satisfying consumption decisions.

Consumer experience within a number of domains also leads to the use of strategies that reduce cognitive effort during decision making. One such strategy involves the process of information search. As noted earlier, older adults, as compared to younger adults, have been found to seek out less information. They also take longer to process the information they do search for.^{29,80} A study instructing participants to make several price inferences indicated that, although older adults indeed sought out less information and took longer to process that information, they also used simpler and less cognitively demanding strategies to process the information, which, in turn, led to higher monetary payoffs.⁸⁰ Thus, as observed in a variety of information processing contexts, older adults can use adaptive decision strategies to facilitate good decision quality despite limitations.

Kirmani & Campbell⁸¹ also indicated, through in-depth surveys conducted with adults across the life span (i.e., ages 18–74), that older adults self-reported a wider range of strategies, as compared to younger adults, for dealing with attempts at persuasion. This was interpreted as a consequence of older adults having more exposure to, and thus experience with, advertising and persuasive messages. Such findings suggest that older adults' experience with persuasion attempts may actually make them relatively resistant to deceptive appeals.

In this section, we have reviewed studies that speak to how aging and expertise influence financial, health, and consumer decisions. Although financial decision making may not always benefit from experience, in decision making involving health and consumer domains, older adults are able to employ adaptive decision strategies. The findings suggest that in many cases, prior knowledge and experience can improve decision making and potentially help older adults overcome limitations imposed by age-related cognitive declines.

Summary and conclusions

In reviewing a large body of extant literature on consumer decision making, we have identified various gaps in knowledge where future research would be helpful in understanding the particular needs of older adults in making decisions. Future research should take into consideration how consumers are influenced by the task environment, the emotional content of information, and the meaningfulness

or personal relevance of tasks and decisions given to them. Detailed processing among older adult participants could be improved through attention to the environment and instructions to engage in imagery-based processing. Researchers should carefully choose decision contexts that are meaningful and relevant to older adults and remain cognizant of the transition to more affective modes of processing strategies and the goal of positive social environments.

Research should also take into consideration the importance of familiarity and expertise in older adults' financial, medical, and consumer decisions as aspects of adaptive strategies to complement deliberation. In general, researchers should seek to uncover factors that lead to systematic positive or negative effects on older consumers' decision making.

Specific knowledge gaps that would benefit from further research include the following:

- How do older adults adapt their decision and choice strategies to maintain high decision quality and satisfaction?
- Under what conditions does the preference of older adults for small consideration sets serve better decision making, and under what conditions does it lead to poor decision making?
- How do distraction and inhibitory failures lead to performance costs as well as benefits for older adults in various domains?
- How can decision aids and environmental supports help older consumers in their decision making and reduce the negative impacts of aging?
- Can emotion-focused instructions compensate more widely for some of the cognitive deficits observed in older people?
- Why does the observed older-and-more-satisfied effect occur?
- Do older adults rely more on independent and marketer-supplied information, more on informal information sources, or both? Does the decision context or importance influence what information older adults ultimately rely on? How does this relate to the decreased information search often observed among older adults in general?
- What factors lead certain groups of people to be unable to compensate for cognitive declines

due to aging with experience in the financial domain? Can these be mitigated in some way?

The discussion within this paper is by no means exhaustive, and many other areas of potential interest to aging and consumer decision making certainly exist. These include investigations of changes in risky decision making across the life span, changes in goals and motivations that consumers face as they age, and how cultural influences modulate age-related changes in consumer decision making. Further research on these topics will add to the literature on decision quality and provide insights into how decision making can be maintained, or even improved, across the adult life span.

Conflicts of interest

The authors declare no conflicts of interest.

References

- Park, D.C., G. Lautenschlager, T. Hedden, *et al.* 2002. Models of visuospatial and verbal memory across the adult life span. *Psychol. Aging* **17**: 299–320.
- Salthouse, T.A. 1996. The processing-speed theory of adult age differences in cognition. *Psychol. Rev.* **103**: 403–428.
- Hess, T.M. 2005. Memory and aging in context. *Psychol. Bull.* **13**: 383–406.
- Yoon, C., C.A. Cole & M.P. Lee. 2009. Consumer decision making and aging: current knowledge and future directions. *J. Consum. Psychol.* **19**: 2–16.
- Moscovitch, M. & G. Winocur. 1995. Frontal lobes, memory, and aging. *Ann. N.Y. Acad. Sci.* **789**: 119–150.
- Roedder John, D. & C.A. Cole. 1986. Age differences in information processing: understanding deficits in young and elderly consumers. *J. Consum. Res.* **13**: 297–315.
- Cole, C.A. & M.J. Houston. 1987. Encoding and media effects on consumer learning deficiencies in the elderly. *J. Market. Res.* **11**: 551–563.
- Hedden, T. & C. Yoon. 2006. Individual differences in executive processing predicts susceptibility to interference in verbal working memory. *Neuropsychology* **20**: 511–528.
- West, R.L. 1996. An application of prefrontal cortex function theory to cognitive aging. *Psychol. Bull.* **120**: 272–292.
- Fleischmann, D.A., R.S. Wilson, J. Gabrieli, *et al.* 2004. A longitudinal study of implicit and explicit memory in old persons. *Psychol. Aging* **19**: 617–625.
- MacIntyre, J.S. & F.I. Craik. 1987. Age differences in memory for item and source information. *Can. J. Psychol.* **41**: 175–192.
- Spencer, W.D. & N. Raz. 1995. Differential effects on memory for content and context: a meta-analysis. *Psychol. Aging* **10**: 527–539.
- Cole, C.A. & G.J. Gaeth. 1990. Cognitive and age-related differences in the ability to use nutritional information in a complex environment. *J. Market. Res.* **27**: 175–184.
- Tversky, A. & D. Kahneman 1974. Judgment under uncertainty: heuristics and biases. *Science* **185**: 1124–1131.
- Kim, S., D. Goldstein, L. Hasher & R.T. Zacks. 2005. Framing effects in younger and older adults. *J. Gerontol. B Psychol. Sci. Soc. Sci.* **60B**: 215–218.
- Chen, Y. & Y. Sun. 2003. Age differences in financial decision-making: using simple heuristics. *Educ. Gerontol.* **29**: 627–635.
- Yoon, C., F. Feinberg & N. Schwarz. 2010. Older consumers and satisfaction. In *The Aging Consumer: Perspectives from Psychology and Economics*. A. Drolet, N. Schwarz & C. Yoon, Eds.: pp. 209–227. Taylor and Francis. London.
- Peters, E. 2010. Age related changes in decision making. In *The Aging Consumer: Perspectives from Psychology and Economics*. A. Drolet, N. Schwarz & C. Yoon, Eds.: 75–101. Taylor and Francis. London.
- Schwartz, B., A. Ward, J. Monterosso, *et al.* 2002. Maximizing versus satisficing: happiness is a matter of choice. *J. Personality Soc. Psychol.* **83**: 1178–1197.
- Yates, J.F. & A.L. Patalano. 1999. Decision making and aging. In *Processing of Medical Information in Aging Patients: Cognitive and Human Factors Perspectives*. D.C. Park, R.W. Morrell & K. Shifren, Eds.: pp. 31–54. Lawrence Erlbaum Associates Publishers. Mahwah, NJ.
- Yoon, C. 1997. Age differences in consumers' processing strategies: an investigation of moderating influences. *J. Consum. Res.* **24**: 329–342.
- May, C.P., L. Hasher & E.R. Stoltzfus. 1993. Optimal time of day and the magnitude of age differences in memory. *Psychol. Sci.* **4**: 326–330.
- Law, S., S.A. Hawkins & F.I.M. Craik. 1998. Repetition-induced belief in the elderly: rehabilitating age-related memory deficits. *J. Consum. Res.* **25**: 91–107.
- Lambert-Pandraud, R., G. Laurent & E. Lapersonne. 2005. Repeat purchasing of new automobiles by older consumers: empirical evidence and interpretations. *J. Market.* **69**: 97–103.
- Lambert-Pandraud, R & G. Laurent. 2010. Impact of age on brand choice. In *The Aging Consumer: Perspectives from Psychology and Economics*. A. Drolet, N. Schwarz & C. Yoon, Eds.: 191–208. Taylor and Francis. London.
- Abaluck, J.T. & J. Gruber. 2009. Choice inconsistencies among the elderly: evidence from plan choice in the Medicare Part D Program. Working Paper No. 14759, The National Bureau of Economic Research.
- Tanius, B.W., S. Wood, Y. Hanoch & T. Rice. 2009. Aging and choice: applications to Medicare Part D. *Judgm. Decis. Mak.* **4**: 92–101.
- Wood, S., Y. Hanoch, A. Barnes, *et al.* 2011. Numeracy and Medicare part D: the importance of choice and literacy for numbers in optimizing decision making for Medicare's prescription drug program. *Psychol. Aging* **26**: 295–307.
- Johnson, M.M.S. 1990. Age differences in decision making: a process methodology for examining strategic information processing. *J. Gerontol. B Psychol. Sci. Soc. Sci.* **45**: 75–78.
- Riggle, E.D.B. & M.M.S. Johnson. 1996. Age differences in political decision making: strategies for evaluating political candidates. *Polit. Behav.* **18**: 99–118.

31. Mather, M., M. Knight & M. McCaffrey. 2005. The allure of the alignable: younger and older adults' false memories of choice features. *J. Exp. Psychol. Gen.* **134**: 38–51.
32. Finucane, M.L., C.K. Mertz, P. Slovic & E.S. Schmidt. 2005. Task complexity and older adults' decision-making competence. *Psychol. Aging* **20**: 71–84.
33. Earles, J. L., A.W. Kersten, B.B. Mas & D.M. Miccio. 2004. Aging and memory for self-performed tasks: effects of task difficulty and time pressure. *J. Gerontol. Psychol. Sci.* **59B**: 285–293.
34. Park, C. W., E.S. Iyer & D.C. Smith. 1989. The effects of situational factors on in-store grocery shopping behavior: the role of store environment and time available for shopping. *J. Consum. Res.* **15**: 422–433.
35. McDowd, J.M. & D.L. Filion. 1992. Aging, selective attention, and inhibitory processes: a psychophysiological approach. *Psychol. Aging* **7**: 65–71.
36. Kosnik, W., L. Winslow, K. Rasinski & R. Sekuler. 1988. Visual changes in daily life throughout adulthood. *J. Gerontol. Psychol. Sci.* **43**: P63–P70.
37. Madden, D.J. 1983. Aging and distraction by highly familiar stimuli during visual search. *Develop. Psychol.* **19**: 499–507.
38. Plude, D.J. & W.J. Hoyer. 1986. Age and the selectivity of visual information processing. *Psychol. Aging* **1**: 4–10.
39. Hasher, L., C. Lustig & R. Zacks. 2007. In *Variation in Working Memory*. A. Miyake, A.R.A. Conway, C. Jarrold, M. J. Kane & J. N. Towse, Eds.: pp. 227–249. Oxford University Press. New York, NY, US.
40. Kim, S., L. Hasher & R.T. Zacks. 2007. Aging and benefit of distractibility. *Psychon. Bull. Rev.* **14**: 301–305.
41. Mednick, S.A. 1968. The remote associates task. *J. Creat. Behav.* **2**: 213–214.
42. Samanez-Larkin, G.R., A.D. Wagner & B. Knutson. 2011. Expected value information improves financial risk taking across the adult life span. *Soc. Cognit. Affect. Neurosci.* **6**: 207–217.
43. Cole, C. A. & S.K. Balasubramanian. 1993. Age differences in consumers' search for information: public policy implications. *J. Consum. Res.* **20**: 157–169.
44. Morrow, D.G., H. Ridolfo, W. Menard, et al. 2003. Environmental support promotes expertise-based mitigation of age differences on pilot communication tasks. *Psychol. Aging* **18**: 268–284.
45. Johnson, M.M.S. 1997. Individual differences in the voluntary use of a memory aid during decision making. *Exp. Aging Res.* **23**: 33–43.
46. Labouvie-Vief, G. & F. Blanchard-Fields. 1982. Cognitive ageing and psychological growth. *Ageing Soc.* **2**: 183–209.
47. Rahhal, T.A., C.P. May & L. Hasher. 2002. Truth and character: sources that older adults can remember. *Psychol. Sci.* **13**: 101–105.
48. Slovic, P., M.L. Finucane, E. Peters & D. G. MacGregor. 2002. The affect heuristic. In *Heuristics and Biases: The Psychology of Intuitive Judgment*. T. Gilovich, D. Griffin & D. Kahneman, Eds.: pp. 397–420. Cambridge University Press. New York.
49. Mather, M. 2006. A review of decision making processes: weighing the risks and benefits of aging. In *When I'm 64*. L.L. Carstensen & C.R. Hartel, Eds.: 145–173. The National Academic Press. Washington DC.
50. Peters, E., T.M. Hess, D. Västfjäll & C. Auman. 2007. Adult age differences in dual information processes. *Perspect. Psychol. Sci.* **2**: 1–23.
51. Mikels, J.A., C.E. Lockenhoff, S.J. Maglio, et al. 2010. Following your heart or your head: Focusing on emotions versus information differentially influences the decision of younger and older adults. *J. Exp. Psychol. Appl.* **16**: 87–95.
52. Carstensen, L.L. 1992. Social and emotional patterns in adulthood: support for socioemotional selectivity theory. *Psychol. Aging* **7**: 331–338.
53. Carstensen, L.L., D.M. Isaacowitz & S.T. Charles. 1999. Taking time seriously: a theory of socioemotional selectivity. *Am. Psychol.* **54**: 165–181.
54. Mather, M. & L.L. Carstensen. 2005. Aging and motivated cognition: the positivity effect in attention and memory. *Trends Cognit. Sci.* **9**: 496–502.
55. Mather, M. & M.R. Knight. 2005. Goal-directed memory: the role of cognitive control in older adults' emotional memory. *Psychol. Aging* **20**: 554–570.
56. Charles, S.T. & L.L. Carstensen. 2009. Social and emotional aging. *Ann. Rev. Psychol.* **61**: 383–409.
57. Fung, H.H. & L.L. Carstensen. 2003. Sending memorable messages to the old: age differences in preferences and memory for advertisements. *J. Person. Soc. Psychol.* **85**: 163–178.
58. Williams, P. & A. Drolet. 2005. Age-related differences in responses to emotional advertisements. *J. Consum. Res.* **32**: 343–354.
59. Cohen, S. & T.A. Wills. 1985. Stress, social support, and the buffering hypothesis. *Psychol. Bull.* **98**: 310–357.
60. Fratiglioni, L., H.X. Wang, K. Ericsson, et al. 2000. Influence of social network on occurrence of dementia: a community-based longitudinal study. *Lancet* **355**: 1315–1319.
61. Hughes, T.F., R. Andel, B.J. Small, et al. 2008. The association between social resources and cognitive change in older adults: evidence from the Charlotte County healthy aging study. *J. Gerontol. B Psychol. Sci. Soc. Sci.* **63**: 241–244.
62. Fornell, C., M.D. Johnson, E.W. Anderson, et al. 1996. The American Consumer Satisfaction Index: nature, purpose, and findings. *J. Market.* **60**: 7–18.
63. Alba, J. W. & J.W. Hutchinson. 1987. Dimensions of consumer expertise. *J. Consum. Res.* **13**: 411–454.
64. Begg, I.M., A. Anas & S. Farinaccon. 1992. Dissociation of processes in belief: source recollection, statement familiarity, and the illusion of truth. *J. Exp. Psychol. Gen.* **12**: 446–458.
65. Hasher, L., D. Goldstein & T. Toppino. 1977. Frequency and the conference of referential validity. *J. Verbal Learn. Verbal Behav.* **16**: 107–112.
66. Skurnik, I., C. Yoon, D.C. Park & N. Schwarz. 2005. How warnings about false claims become recommendations. *J. Consum. Res.* **31**: 713–724.
67. Camerer, C.F. & E.J. Johnson. 1991. The process-performance paradox in expert judgment: How can experts know so much and predict so badly? In *Toward a General Theory of Expertise: Prospects and Limits*. K. Anders Ericsson & Jacqui Smith, Eds.: 195–217. Cambridge University Press. New York.
68. Shanteau, J. 1992. Competence in experts: the role of task characteristics. *Organ. Behav. Hum. Decis. Process.* **53**: 252–266.

69. Wood, S.L. & J.G. Lynch. 2002. Prior knowledge and complacency in new product learning. *J. Consum. Res.* **29**: 416–426.
70. Bandura, A. 1976. Self-reinforcement: theoretical and methodological considerations. *Behaviorism* **4**: 135–155.
71. Brucks, M. 1985. The effects of product class knowledge on information search behavior. *J. Consum. Res.* **12**: 1–16.
72. Johnson, E.J. & J.E. Russo. 1984. Product familiarity and learning new information. *J. Consum. Res.* **11**: 542–550.
73. Komiotis, G.M. & A. Kumar. 2009. Do older investors make better investment decisions? *Rev. Econ. Stat.* **93**: 244–265.
74. Agarwal, S., J.C. Driscoll, X. Gabaix & D. Laibson. 2009. The age of reason: decisions over the life-span with implications for regulation. *Brookings Pap. Econ. Activ.*
75. Chang, S.J., K.J. Lee, I.S. Kim & W.H. Lee. 2008. Older Korean people's desire to participate in health care decision making. *Nursing Ethics* **15**: 73–86.
76. Lumpkin, J.R. & T.A. Festervand. 1988. Purchase information sources of the elderly. *J. Advert. Res.* **27**: 31–43.
77. Boscarino, J. & S.R. Steiber. 1982. Hospital shopping and consumer choice. *J. Health Care Market.* **2**: 15–23.
78. Löckenhoff, C.E. & L.L. Carstensen. 2007. Aging, emotion, and health-related decision strategies: motivational manipulations can reduce age differences. *Psychol. Aging* **22**: 134–135.
79. Castel, A.D. 2005. Memory for grocery prices in younger and older adults: the role of schematic support. (Special Issue: Emotion–Cognition Interactions and the Aging Mind) *Psychol. Aging* 718–721.
80. Mata, R., L.J. Schooler & J. Rieskamp. 2007. The aging decision maker: cognitive aging and the adaptive selection of decision strategies. *Psychol. Aging* **22**: 796–810.
81. Kirmani, A. & M.C. Campbell. 2004. Goal seeker and persuasion sentry: how consumer targets respond to interpersonal marketing persuasion. *J. Consum. Res.* **31**: 573–582.