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Memory and Curiosity for Free Grocery Items and Prices in Younger and Older Adults

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ABSTRACT

Background: Older adults often show memory deficits, but these deficits can be reduced when newly learned information is consistent with one's schemas (prior knowledge). For example, research has found similar memory performance for young and older adults when remembering realistic market-value grocery items and prices; however, age-related differences are more prominent for overpriced items, which are inconsistent with schemas. In the present work, we examined how labelling items as free may impact memory for prices, and if curiosity may influence how younger and older adults remember price information. Experiment 1 investigated young and older adults' memory for free, market-priced, and overpriced items. In Experiment 2, participants' curiosity for learning the items and their prices was investigated to see if curiosity can be predictive of performance accuracy for information that is consistent and inconsistent with their schemas.

Methods: In Experiment 1, participants were shown grocery store items and were tested on the exact prices of these items and the categories they belong to. In Experiment 2, participants were first shown items and asked how curious they were to learn the price of the item. Participants were then shown the grocery item's price and category label, and were later tested on the associations of these items.

Results: Across both experiments, older adults were more accurate in recalling market-priced and free items compared to overpriced items. In contrast, younger adults did not show significant differences across price conditions. In Experiment 2, state curiosity significantly predicted accuracy in recalling exact prices, with this relationship being particularly strong among older adults.

Conclusion: Findings suggest that older adults benefit more from schematic support when remembering price information and that state curiosity enhances memory accuracy, especially for older adults. Schematic support and state curiosity may help mitigate age-related memory deficits.

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Older adults may experience a variety of changes in memory. Older adults often exhibit deficits in associative memory, which is the pairing of two pieces of information in memory, such as pairing a face with a name (e.g., James, 2006; Naveh-Benjamin et al., 2004) or with new pieces of information (Castel et al., 2016; Old & Naveh-Benjamin, 2008). Research has shown that older adults have specific difficulties with name-to-face pairings (e.g., James, 2006; Naveh-Benjamin et al., 2004), face-to-face pairings (e.g., Rhodes et al., 2008), and

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unrelated units of information (e.g., Castel, 2007; Naveh-Benjamin, 2000), suggesting that older adults may be deficits in remembering links between unrelated units of information.

People generally rely on schematic information rather than details when trying to retrieve information (Alba & Hasher, 1983). Schemas help people remember newly learned information, especially when trying to remember larger amounts of information (e.g., Castel, 2005). Schemas are thought to provide support by new information activating a prior schema before encoding, which then leads to better memory of that information if it is consistent with that prior schema (Besken & Gülgöz, 2009; Whatley & Castel, 2022). Some research has shown that both young and older adults can benefit from schematic support, as it can help reduce effortful processing at encoding (Castel et al., 2013; McGillivray & Castel, 2010; Soederberg Miller, 2009). Other research suggests that people benefit from schematic support because prior knowledge can be perceived as more meaningful than new information (Fung et al., 2018; Hess, 2014). However, despite the many potential benefits of schematic support, schemas can also lead to memory errors (Alba & Hasher, 1983; Brewer & Treyens, 1981). These errors are prevalent in both age groups (Alberts & Castel, 2025; Brainerd & Reyna, 2004; Braun LaTour et al., 2004; Schacter et al., 1997). Older adults are particularly prone to these errors and primarily rely on gist-based memory when needing to retrieve information (e.g., Devitt & Schacter, 2016) because older adults tend to misremember verbatim details (e.g., Brainerd & Reyna, 2004). These errors can also be more prevalent with increased memory demands, such as longer delays between learning and retrieval (Flores et al., 2017). These errors may be detrimental when individuals view detailed information that is framed for individuals to only get the main message of information, such as scams, sweepstakes, and advertisements (Braun LaTour et al., 2004).

Schemas can help both younger and older adults remember schema-specific information (Arbuckle et al., 1994; Craik & Bosman, 1992; Hess & Slaughter, 1990). Castel (2005) aimed to investigate schematic information further by examining how young and older adults remember price information that is consistent and inconsistent with prior schematic information. Castel (2005) showed participants grocery items (e.g., beans, potatoes) that were accompanied by a price that was either market-priced, underpriced, or overpriced for the specific items. They found that participants overall had better memory for market-priced items, or items that were consistent with prior schemas, than for the other categories. Young adults also showed more accurate recall of the item prices than older adults. This was thought to be the case because older adults relied more on prior schemas than young adults when retrieving information from memory, and therefore rely on prior knowledge of grocery store prices when retrieving information from memory. These findings have been replicated in a variety of similar studies (Bermingham et al., 2016; Castel et al., 2013; Kan et al., 2009; Whatley & Castel, 2022). Whatley and Castel (2022) were able to replicate these findings when they conducted a self-paced version of this paradigm. They also found that despite both young and older adults studying the overpriced items for longer, participants gave higher judgments of learning (JOLs) for market-priced than for overpriced items, meaning that they were more confident in their learning of market-priced items. Studies have found that differences in confidence are important for shifting retrieval strategies (Kuhns & Touron, 2020). Thus, there may be a variety of reasons that older adults can remember schema-consistent associative information, and we examined these issues further in the present study, specifically in terms of how labeling items as free, and how curiosity to learn their prices may impact memory.

Curiosity is a motivator for learning and can enhance memory performance (Hargis et al., 2020; Zacks & Hasher, 2006). Curiosity is defined as the desire to acquire new knowledge (Berlyne, 1960). Curiosity is often investigated in two forms, state and trait curiosity. State curiosity refers to a specific feeling of curiosity when responding to information in a situation, while trait curiosity refers to a person's tendency to learn and seek out new information overall (Kashdan et al., 2018; Peters, 1978; Whatley et al., 2025). While some studies have found that types of curiosity are found to generally decline as we age, trait curiosity is important for older adults, as it is often a motivator for older adults to learn (Kim & Merriam, 2004; Robinson et al., 2017; Xiong & Zuo, 2019). It has also been found to help people age successfully by being a protective factor, which includes benefits in mitigating age-related declines in cognitive abilities and is associated with greater cognitive reserve (Hargis et al., 2020; Park et al., 2014; Sakaki et al., 2018; Wiegand et al., 2025). State curiosity has also been found to boost memory, and age-related memory differences can be decreased when older adults are interested in the topic of learning (Hargis et al., 2020; Sobczak et al., 2025; Zacks & Hasher, 2006), and if the topic has some personal relevance (Chu & Fung, 2022). In addition, older adults' accuracy for remembering answers to trivia questions has been found to increase as curiosity increases. For example, McGillivray et al. (2015) found that older adults' accuracy for remembering trivia answers after a delay was predicted by interest in learning the answers.

While curiosity can be beneficial in many ways, curiosity may also be potentially dangerous when people are being targeted by scams (Hargis et al., 2020). Curiosity can lead to people trying to engage more with a potential "opportunity" or the potential for getting a "free" product could lead to increased victimization by scams/fraud (Yoon et al., 2009). Curiosity for "free" products has not been studied before. In addition, curiosity has not been explored using the grocery prices paradigm to see if curiosity impacts one's memory for the prices of the items (Castel, 2005), serving as a mechanism that guides attention and memory in this context.

Experiment 1

In Experiment 1, we examined how labeling items as free may impact memory for the items' prices. At a practical level, free items may carry consumer interest, as some promotions are "buy one, get one free" or are given to consumers as a free promotion of a new product. Thus, the value of a free item may be important to remember, and is often consistent with one's schemas and expectations. At a theoretical level, free items may garner attention toward prices, as one may want to learn the value of the free item and compare it with prior knowledge, leading to episodic memory formation. However, free labels may also guide people to forget the price, much like a directed forgetting cue, where participants may think they will be getting the item for free and therefore do not need to remember the price of the item (e.g., Bowen et al., 2020; Hennessee et al., 2024; Sahakyan et al., 2008). In the present study, we conceptualize "free" primarily as a categorical label rather than as a numeric value to be remembered. Therefore, memory for free items in this task is intended to reflect schematic and motivational influences on price memory, rather than everyday encoding strategies of the numeric cost of a free item (i.e., $0).

Experiment 1 used a paradigm similar to Castel (2005) and Whatley and Castel (2022) while also investigating young and older adults' memory for items that are labeled as "free."

We hypothesized that young adults would be more accurate in recalling overpriced items than older adults. We predicted no age differences in recall accuracy for the market-priced and free item prices, as they are consistent with schemas. We also hypothesize that young and older adults would be more accurate at recalling prices for free and market-priced items than for overpriced items. For category recall (when participants were asked to remember the more general value category associated with the items), we predicted that young and older adults would perform similarly, consistent with older adults being able to remember gist-based information about the prices of items (Flores et al., 2017). However, we predicted that older adults would remember the items that are labeled as "free" more than items from other categories. Older adults are generally particularly prone to falling for scams relating to winning sweepstakes or free prizes (Federal Trade Commission, 2025) and are, in some cases, more motivated to save and conserve funds than young adults, and may focus on gains (e.g., Castel et al., 2016; Freund, 2006). Therefore, we predict that the free label may capture greater interest and could be considered unique for older adults.

We also asked the participants a series of questions inquiring about which categories they were trying to pay attention to more and which categories they found easier or harder to remember. In accordance with Whatley and Castel (2022), we predicted that young and older adults would report finding the overpriced items harder to remember than the other categories, and we predicted that older adults would report finding the overpriced items harder to remember than young adults. We also predicted that young adults and older adults would report paying more attention to the overpriced item prices, and older adults would pay more attention to the "free" item categories, and that this may impact memory for the prices of items in these categories.

Methods

Participants

Thirty-nine young adult participants (age range 18–36 years old; $M_{age} = 20.61$, $SD = 3.04$) were recruited through UCLA's undergraduate subject pool on SONA and participated online. Thirty-nine older adult participants (age range 65–80 years old; $M_{age} = 69.59$, $SD = 4.19$) were recruited through Prolific and participated online. Young adults received course credit for participating in the study, with 1 h of participation equaling one course credit granted. Older adults were compensated US $10 per hour. An a priori power analysis, using G*Power 3.1.7 (Faul et al., 2007), indicated that for a 2 (age: young, old) × 3 (label: market-priced, overpriced, free) mixed repeated-measures ANOVA, assuming alpha = .05 and power = .80, 54 participants would be needed to reliably detect a small to medium effect size ($n_p^2 = .03$). Informed consent was acquired, and the study was completed in accordance with the UCLA Institutional Review Board. This experiment was not formally preregistered.

Materials

The experiment included 48 common grocery store items (e.g., apples, beans). The items were split into four lists (12 items per list). Each of the items was counterbalanced and randomized across the lists. Prices for each of the items were based on real market-priced items from grocery stores. The market-priced items ranged from $0.49 to $7.99. The overpriced items' prices were created by generating a random number between $6 and $8 and adding it to the market prices for each item. Therefore, the range for the overpriced

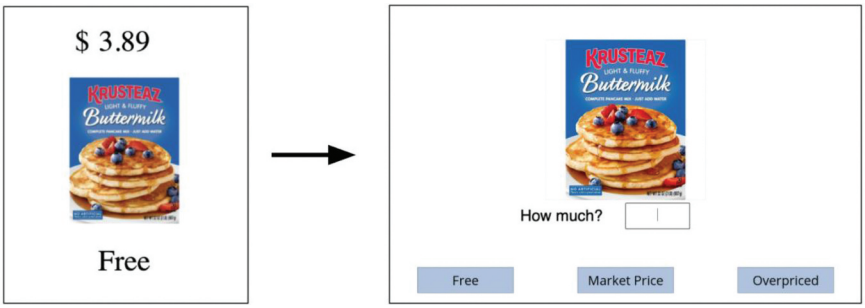

Figure 1. An example of the procedure from Experiment 1.

items' prices ended up being $8.49 to $15.09. All the items ended with the number nine, and the participants were informed of this when studying and recalling the prices.

Procedure

Participants were shown four lists with 12 items per list. Participants were tested on their memory for the items' prices after studying each list. When the participants studied the items, they were shown each item for 10 s. A picture of each item was shown with the price of the item on top of the picture, and the category label (market-priced, overpriced, or free) was under the picture of the item. After viewing the 12 items, participants were tested on the prices of the items. The participants viewed the picture of the item again and were asked to type in how much the price was. Then they were asked to press a button indicating which category the item belonged to (market price, overpriced, or free). Figure 1 shows an example of this procedure. After completing the four lists, the participants answered different questions about their attention level and perception of ease in remembering the different prices and categories. Participants were asked questions such as "Did you pay attention to any specific category more than others?" There were five questions in total. Participants responded to the questions by selecting "free," "market-priced," "overpriced," or "no preference." Participants were also asked on a scale of one (never) to ten (often), how often they shopped for grocery items in person and online. Lastly, to assess trait curiosity, participants completed the Epistemic Curiosity Scale (ECS; Litman, 2008; Litman & Spielberger, 2003). This scale includes 10 items where participants rate statements on a scale of 1 (almost never) to 4 (always). An example of these statements is, "I find it fascinating to learn new information."

Results

Recall accuracy for exact prices is shown in Figure 2. A 3 (label: market-priced, free, and overpriced) by 2 (age: young, older) mixed model ANOVA was used to analyze participants' recall of the exact prices of the grocery store items. The model revealed an effect of age, $F(1, 3723) = 22.42$, $p < .001$, $n_p^2 = .006$, where older adults ($M = .37$, $SD = .48$) were more accurate than young adults ($M = .30$, $SD = .46$). There was also a significant effect of label, $F(2, 3723) = 8.79$, $p < .001$, $n_p^2 = .005$. Participants were more accurate in recalling market-priced items ($M = .37$, $SD = .48$) than overpriced items ($M = .29$, $SD = .46$), $t(3723) = 4.19$, $p < .001$. There

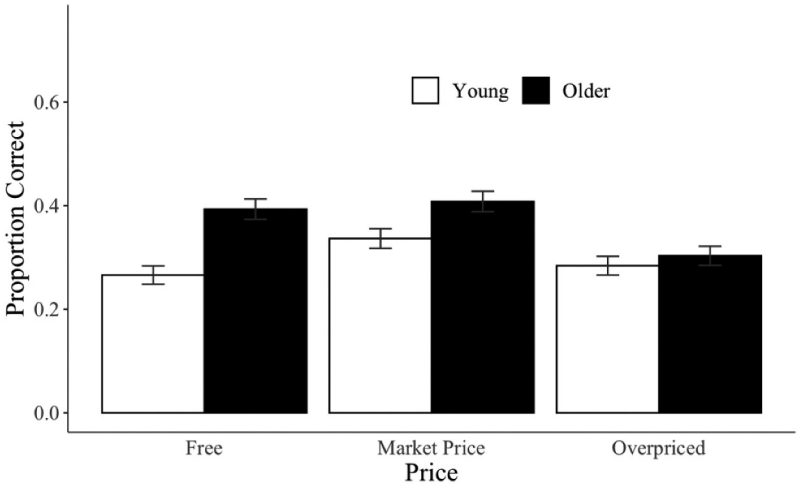

Figure 2. Participants' recall of exact grocery prices for items in Experiment 1. Error bars reflect the standard error of the mean.

was no difference in recall between market-priced and free items ($M = .33$, $SD = .47$), $t(3723) = 2.27$, $p = .07$, nor with free and overpriced items, $t(3723) = 1.91$, $p = .17$. The model also revealed a significant label by age interaction, $F(2, 3723) = 4.14$, $p = .02$, $n_p^2 = .002$. Older adults ($M = .39$, $SD = .49$) were more accurate than young adults ($M = .27$ $SD = .44$) in recalling the prices of free items, $t(3723) = 4.79$, $p < .001$. There was no difference between young ($M = .34$, $SD = .47$) and older adults' recall ($M = .41$, $SD = .49$) for market-priced, $t(3723) = 2.69$, $p = .11$, and overpriced items ($M_{young} = .28$, $SD_{young} = .45$; $M_{older} = .30$, $SD_{older} = .46$), $t(3723) = .72$, $p = 1.00$. Older adults had a more accurate recall of prices for free items, $t(3723) = 3.38$, $p = .01$, and market-priced items, $t(3723) = 3.94$, $p = .001$, than

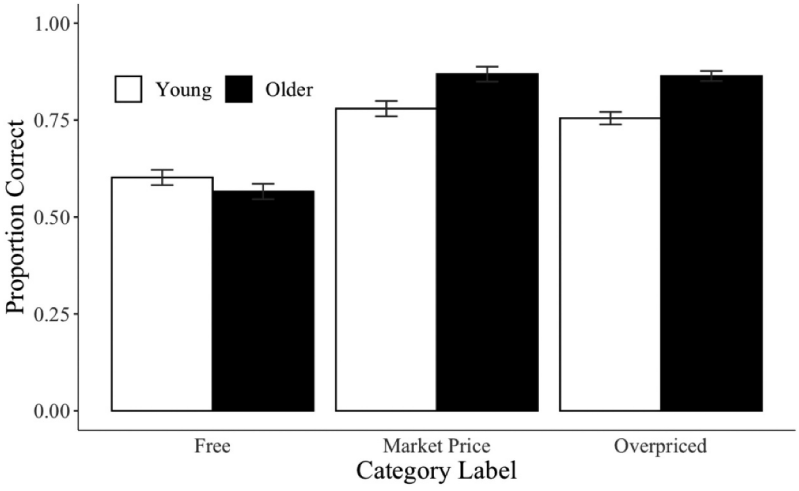

Figure 3. Participants' recall of category labels in Experiment 1. Error bars reflect the standard error of the mean.

overpriced items. There was no difference between older adults' recall for free and market-priced item prices, $t(3723) = .56$, $p = 1.00$. There was also no difference between young adults' recall of free and market-priced items, $t(3723) = 2.66$, $p = .12$, free and overpriced items, $t(3723) = .68$, $p = 1.00$, and overpriced and market-priced items, $t(3723) = 1.98$, $p = .72$.

Recall accuracy for category labels is shown in Figure 3. A 3 (label: market-priced, free, and overpriced) by 2 (age: young, older) mixed model ANOVA was used to analyze participants' recall of the category labels of the grocery store items. Category labels refer to how well each participant remembered which grocery item was "free," "market priced," and "overpriced." The model revealed a significant effect of age, $F(1, 3723) = 17.10$, $p < .001$, $n_p^2 = .005$. Older adults ($M = .77$, $SD = .42$) were more accurate in recalling the category labels than young adults ($M = .71$, $SD = .46$), $t(3723) = 4.13$, $p < .001$. There was also a significant effect of label, $F(2, 3723) = 129.2$, $p < .001$, $n_p^2 = .065$. Participants were more accurate in recalling the labels of market-priced ($M = .82$, $SD = .38$), $t(3723) = 14.40$, $p < .001$, and overpriced items ($M = .81$, $SD = .40$), $t(3723) = 13.40$, $p < .001$, than free items ($M = .58$, $SD = .49$). There was no difference in recall of market-priced and overpriced category labels, $t(3723) = 1.00$, $p = .95$. There was also a significant age by label interaction, $F(2, 3723) = 10.80$, $p < .001$, $n_p^2 = .006$. Older adults were more accurate in recalling the category labels of market-priced ($M_{young} = .77$, $SD_{young} = .42$; $M_{older} = .87$, $SD_{older} = .34$), $t(3723) = 3.83$, $p = .002$, and overpriced items ($M_{young} = .75$, $SD_{young} = .43$; $M_{older} = .86$, $SD_{older} = .34$), $t(3723) = 4.70$, $p < .001$, than young adults. There was no difference in category recall for free items between young ($M = .60$, $SD = .49$) and older adults ($M = .56$, $SD = .50$), $t(3723) = 1.37$, $p = 1.00$. Older adults were more accurate in recalling the market-priced, $t(3723) = 12.76$, $p < .001$, and overpriced category labels, $t(3723) = 12.49$, $p < .001$, than free items. There was no difference in older adults' category recall of market-priced and overpriced items, $t(3723) = .27$, $p = 1.00$. Young adults were also more accurate in recalling the category labels of market-priced, $t(3723) = 7.60$, $p < .001$, and overpriced items, $t(3723) = 6.45$, $p < .001$, than free items. There was no difference in young adults' category recall of market-priced and overpriced items, $t(3723) = 1.15$, $p = 1.00$.

Questionnaires

A chi-square test of independence was conducted to examine young and older adults' category choices (free, market-priced, overpriced, no preference) when completing our questionnaire. We then computed a chi-square goodness-of-fit test to see if category selections differed when collapsed across age groups. First, we aimed to see whether participants found some prices easier to remember than others. The distribution of choices did not differ significantly across age groups, χ^2 $(3, N = 75) = 6.31$, $p = .10$, indicating that young and older adults selected the categories at similar rates. When collapsing across age groups, participants' selections of the four categories differed from chance, χ^2 $(3, N = 75) = 18.92$, $p = .006$. Standardized residuals indicated that overpriced items ($z = 3.53$) were selected more often than expected, and free items were chosen less often than expected ($z = -2.87$).

Next, we examined whether young and older adults found some categories easier to remember than others. The distribution of category choices did not differ significantly across age groups, χ^2 $(3, N = 74) = 5.31$, $p = .15$, indicating that young and older adults

selected the categories at similar rates. When collapsing across age group, participants' selections of the four categories differed from chance, χ^2 (3, $N = 74$) = 10.87, $p = .01$. Standardized residuals indicated that overpriced items ($z = 3.09$) were selected more often than expected, and market-priced items were chosen less often than expected ($z = -2.01$).

We examined whether young and older adults attended to some categories more than others. The distribution of category choices did not differ significantly across age groups, χ^2 (3, $N = 75$) = 1.63, $p = .65$, indicating that young and older adults selected the categories at similar rates. When collapsing across age groups, participants' selections of the four categories differed from chance, χ^2 (3, $N = 75$) = 20.63, $p < .001$. Standardized residuals indicated that overpriced items ($z = 3.53$) were selected more often than expected, and market-priced items were chosen less often than expected ($z = -3.13$).

We also examined whether young and older adults found some prices harder to remember. The distribution of choices did not differ significantly across age groups, χ^2 (3, $N = 75$) = 1.70, $p = .64$, indicating that young and older adults selected the price categories at similar rates. When collapsing across age groups, participants' selections of the four price categories differed from chance, χ^2 (3, $N = 75$) = 9.96, $p = .02$. Standardized residuals indicated that "no preference" ($z = 3.0$) was selected more than expected.

We examined whether young and older adults found some price categories harder to remember. The distribution of category choices did not differ significantly across age groups, χ^2 (3, $N = 75$) = 1.11, $p = .78$, indicating that young and older adults selected the categories at similar rates. When collapsing across age groups, participants' selections of the four categories differed from chance, χ^2 (3, $N = 75$) = 15.40, $p = .002$. Standardized residuals indicated that "no preference" ($z = 3.27$) was selected more than expected, and free ($z = -3.13$) was selected less than expected.

Lastly, an independent t-test was conducted to examine the differences between the grocery shopping habits of young and older adults. We found that older adults ($M_{in\text{-}store} = 8.30$, $SD_{in\text{-}store} = 2.44$; $M_{online} = 4.58$, $SD_{online} = 3.43$) shopped in-store, $t(76) = 4.91$, $p < .001$, and online, $t(76) = 2.21$, $p = .03$, more than young adults ($M_{in\text{-}store} = 5.56$, $SD_{in\text{-}store} = 2.49$; $M_{online} = 3.09$, $SD_{online} = 2.42$). Participants' grocery shopping habits and how they relate to recall of exact prices and category labels were analyzed by fitting logistic mixed-effects models using the *glmer* function in R Version 4.3.1 (R Core Team, 2021). The models included a two-way interaction for age (young vs. old) X grocery shopping habits. We calculated participants' overall grocery store habits by adding each participant's in-store and online shopping scores. Age was dummy coded with "older adults" as the comparison group. We also included random intercepts for participants and grocery items. The model for exact prices revealed that shopping habits were not a significant predictor of price results, $b = .08$, $SE = .05$, $z = 1.75$, $p = .08$. There was also no significant interaction between age group and shopping habits, $b = .11$, $SE = .07$, $z = -1.53$, $p = .13$, for recall of exact prices. The model for category labels did reveal a significant effect of shopping habits where the more participants indicated shopping the more accurate they were in their recall of category labels, $b = .07$, $SE = .03$, $z = 2.10$, $p = .04$. There was no significant interaction between age group and shopping habits, $b = .06$, $SE = .05$, $z = -1.32$, $p = .19$, for memory for category labels.

Discussion

In the present study, older adults were overall more accurate than young adults when recalling the exact prices of items. More specifically, we found that older adults were more accurate in recalling the prices of free items than young adults. There was no difference in age group in recalling the prices of market-priced and overpriced items. Consistent with our hypothesis, older adults were more accurate in recalling free and market-priced items than overpriced item prices. However, we did not find any difference in the recall of prices for young adults. When investigating category recall, older adults were also overall more accurate than young adults. More specifically, older adults were more accurate in remembering the category labels for market-priced and overpriced items than young adults. We initially hypothesized that older adults would be more accurate in recalling free items than other categories. However, young and older adults were also more accurate in recalling market-priced and overpriced items than free items, which was inconsistent with our hypothesis.

We predicted that older adults would perceive overpriced items as harder to remember than other categories. We also predicted that older adults would find overpriced items harder to remember than young adults. Interestingly, we found no age differences in their perception of difficulty in remembering these categories. In addition, we found that young and older adults reported that they attended to overpriced items more than the other categories, possibly because they perceived this category as being costly to forget (Murphy & Castel, 2021). We also found that both age groups perceived overpriced items as easier to remember than other categories. Therefore, despite older adults recalling overpriced items worse than other categories, older adults perceived them as easier to remember. This could possibly be due to participants attending to these items more than others; however, this closer attention to these items did not seem to show a benefit in the actual task. This finding highlights the impact of recalling information that aligns with prior schematic information on one's accuracy in recall.

Experiment 2

In Experiment 2, participants' curiosity for learning the prices of the items was also investigated to see if curiosity can be predictive of performance accuracy for information that is consistent and inconsistent with prior schemas. We predicted that both young and older adults' accuracy in recall for the item's prices would be more accurate for items that they were more curious to learn the price of. This type of finding would extend prior work that suggests that curiosity guides older adults' memory, such that healthy older adults selectively remember information that they are particularly curious about (Castel, 2008, 2024; McGillivray et al., 2015). We were also interested in whether there would be differences based on the item categories, and if older adults would show a stronger relationship between curiosity and memory for the general category information, suggesting that curiosity also guides how gist-based information is retained. In addition, we hypothesize that higher levels of trait curiosity in individuals will be related to higher accuracy in individuals.

Figure 4. An example of the procedure from Experiment 2.

Methods

Participants

Forty-two young adult participants (age range 18–23 years old; $M_{age} = 20.10$, $SD = 1.11$) were recruited through UCLA's undergraduate subject pool on SONA and participated online. Forty-two older adult participants (age range 55–79 years old; $M_{age} = 68.64$, $SD = 4.69$) were recruited through Prolific and participated online. Young adults received course credit for participating in the study, with 1 h of participation equaling one course credit granted. Older adults were compensated US $10 per hour. An a priori power analysis, using G*Power 3.1.7 (Faul et al., 2007), indicated that for a 2 (age: young, old) × 3 (label: market-priced, overpriced, free) mixed repeated-measures ANOVA, assuming alpha = .05 and power = .80, 54 participants would be needed to reliably detect a small to medium effect size ($n_p^2 = .03$). Informed consent was acquired, and the study was completed in accordance with the UCLA Institutional Review Board. This experiment was not formally preregistered.

Procedure and Materials

Experiment 2 included the same materials as Experiment 1. The procedure also closely resembled that of Experiment 1. Participants were shown four lists, which included 12 items per list. Participants were tested on their memory for the price of the items after studying each list. When the participants studied the items, they were first shown an image of an item for 5 s. They were then asked on a scale of one to ten, how curious they were to learn the price of the item (1 = not interested at all, 10 = very interested). Then a picture of each item was shown with the price of the item on top of the picture. The category label (market-priced, overpriced, or free) was shown under the picture of the item for 10 s. After viewing the 12 items, participants were tested on the prices of the items. The participants viewed the picture of the item again and were asked to type how much the price was. Then they were asked to press a button indicating which category the item belonged to (market-priced, overpriced, or free). Figure 4 shows an example of this procedure. After completing four lists, the participants answered the same questions about their attention level for the different prices and categories, and prevalence for grocery shopping that were asked in Experiment 1. Participants then completed the Epistemic Curiosity Scale (Litman, 2008; Litman & Spielberger, 2003).

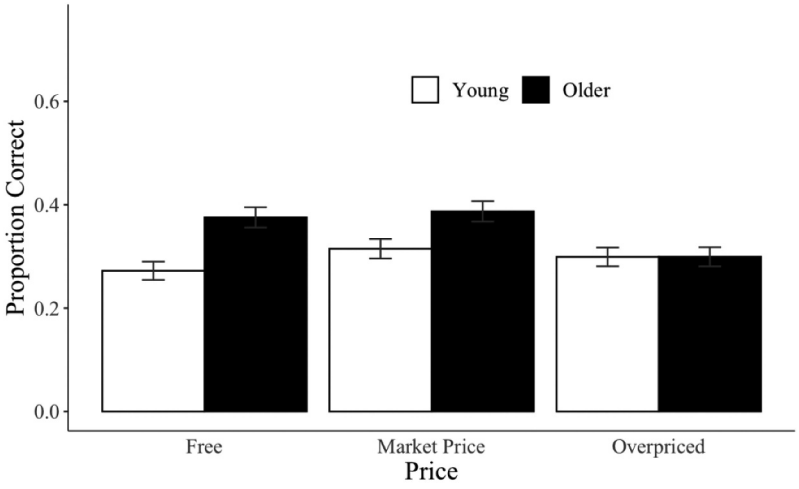

Figure 5. Participants' recall of exact grocery prices for items in Experiment 2. Error bars reflect the standard error of the mean.

Results

Exact Price Recall

Recall accuracy of exact prices is shown in Figure 5. In addition, the relationship between accuracy and curiosity when young and older adults recalled exact prices is shown in Figure 6. In terms of overall ratings of state curiosity for the prices provided by participants, older adults had higher average state curiosity ratings ($M = 6.65$, $SD = 2.59$) than young adults ($M = 4.89$, $SD = 2.61$), $t(5370) = 23.95$, $p < .001$. Participants' curiosity about grocery store item prices and how they relate to recall of exact prices was analyzed by fitting a logistic mixed-effects model using the *glmer* function in R Version 4.3.1 (R Core Team, 2021). The model included a three-way interaction for age (young vs. old) X label (market-priced, free, overpriced) X state curiosity. The model also included trait curiosity as a predictor. Continuous variables (state curiosity, trait curiosity) were standardized (z-scored) within participants before analysis to help facilitate interpretation. All variables were dummy coded with "older adults" as the comparison for age and "free" as the comparison for label. We also included a random intercept for participants and grocery items. To test the simple effects of the model, we compared the estimated marginal means and trends of the full model using *emmeans, emtrends*, and *pairs* functions from Version 1.8.4 of the *emmeans* R package (Lenth, 2023).

The model revealed a significant effect of state curiosity, which indicated a positive association between state curiosity and accuracy, $b = .36$, $SE = .10$, $z = 3.46$, $p < .001$. The model also revealed a slightly significant effect of trait curiosity; however, it indicated a negative association between trait curiosity and accuracy, $b = -.03$, $SE = .02$, $z = -1.98$, $p = .048$. There was also a main effect of age, where older adults ($M = .35$, $SD = .48$) were more accurate than young adults ($M = .30$, $SD = .46$), $b = .59$, $SE = .28$, $z = 2.10$, $p = .04$. The model revealed a significant effect of label. Participants were more accurate in recalling the prices of market-priced ($M = .35$, $SD = .48$) items than overpriced items ($M = .30$, $SD = .46$), $b = .35$, $SE = .10$, $z = 3.54$, $p = .001$. There was no difference in the recall of prices between

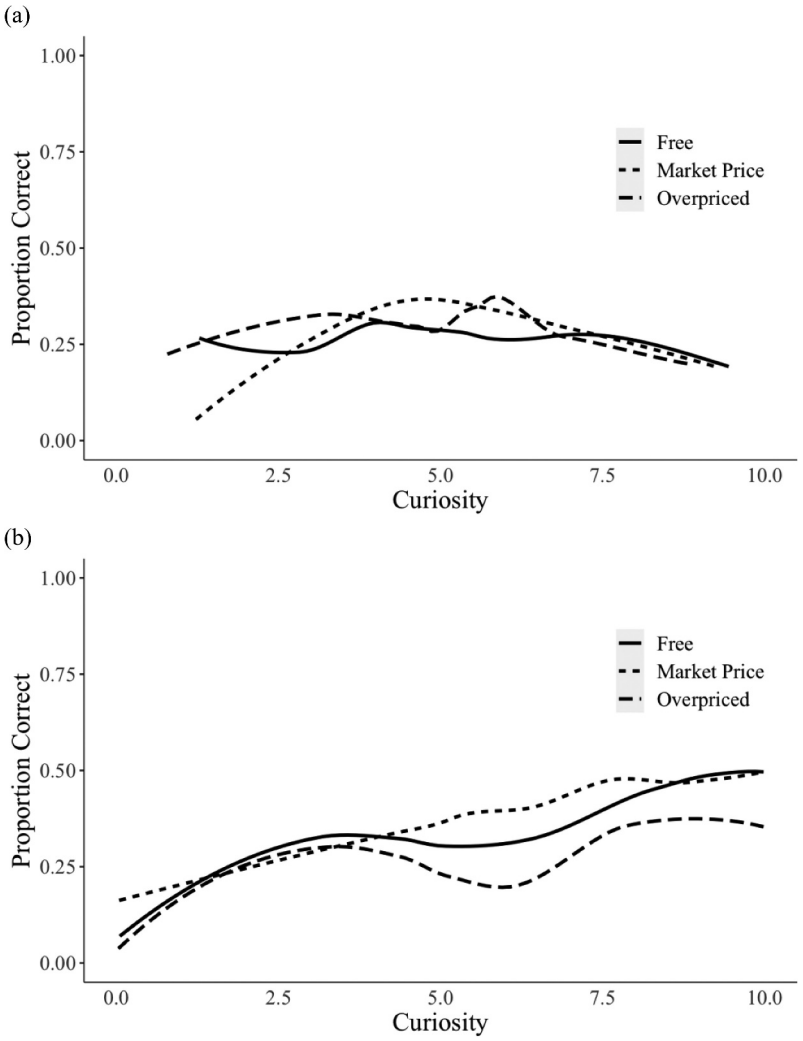

Figure 6. The relationship between young (a) and older (b) adults' curiosity and accuracy in remembering the exact prices of grocery items in Experiment 2.

free ($M = .33$, $SD = .47$) and market-priced items, $b = .15$, $SE = .10$, $z = 1.56$, $p = .26$, nor free and overpriced items, $b = .20$, $SE = .10$, $z = 1.97$, $p = .12$.

The model also revealed a significant label by age interaction. Older adults were less accurate in their recall of overpriced item prices ($M = .30$, $SD = .46$) than free item prices ($M = .38$, $SD = .46$), $b = .43$, $SE = .14$, $z = 3.12$, $p = .02$, and market-priced item prices ($M = .39$, $SD = .49$), $b = .53$, $SE = .14$, $z = 3.85$, $p = .002$. There was no difference in older adults' recall of free and market-priced item prices, $b = .10$, $SE = .13$, $z = .75$, $p = .98$. There was also no difference in young adults recall of free ($M = .27$, $SD = .45$) and market priced items ($M = .32$, $SD = .47$), $b = .20$, $SE = .14$, $z = 1.45$, $p = .70$, free and overpriced items ($M = .30$, $SD = .46$), $b = .04$, $SE = .14$, $z = .28$, $p = 1.00$, nor market-priced and overpriced items, $b = .16$, $SE = .14$, $z = 1.17$, $p = .85$. There was also no difference in young and older adults recall of free item prices, $b = .59$, $SE = .28$, $z = 2.10$, $p = .29$, market priced item prices,

$b = .49$, $SE = .28$, $z = 1.74$, $p = .51$, nor overpriced item prices, $b = .13$, $SE = .29$, $z = .44$, $p = 1.00$. There was no label by curiosity or age by curiosity intervention.

The model revealed a significant label by age by curiosity interaction. There was a significant positive association between curiosity and accuracy when older adults recalled the prices of free items, $\beta = .36$, $SE = .10$, 95% CI [.15, .56], market-priced items, $\beta = .29$, $SE = .09$, 95% CI [.09, .49], and overpriced items, $\beta = .32$, $SE = .11$, 95% CI [.11, .53]. There was also a positive association when young adults recalled the prices of free items, $\beta = .16$, $SE = .12$, 95% CI [−.07, .39], yet not significant. There was a non-significant negative association when young adults recalled the prices of market-priced, $\beta = -.04$, $SE = .12$, 95% CI [−.27, .20]. There was a significant negative association when young adults recalled overpriced items, $\beta = -.28$, $SE = .12$, 95% CI [−.51, −.05]. There was no difference in the strength of the relationship between accuracy and curiosity for older adults' recall of free and market-priced item prices, $b = .07$, $SE = .13$, $z = .52$, $p = .86$, free and overpriced items, $b = .03$, $SE = .13$, $z = .25$, $p = .97$, market priced and overpriced items, $b = .03$, $SE = .13$, $z = .26$, $p = .96$. There was no difference in strength of the relationship between accuracy and curiosity for young adults' recall of free and market priced items, $b = .20$, $SE = .16$, $z = 1.25$, $p = .43$, nor market-priced and overpriced, $b = .24$, $SE = .15$, $z = 1.55$, $p = .27$. There was a stronger relationship for young adults' recall of free item prices than overpriced items, $b = .44$, $SE = .16$, $z = 2.81$, $p = .01$. There was no difference in the strength of relationship for young and older adults when recalling free items, $b = .20$, $SE = .16$, $z = 1.25$, $p = .21$. However, there was a stronger relationship between accuracy and curiosity for older adults than young adults when recalling market-priced item prices, $b = .33$, $SE = .16$, $z = 2.04$, $p = .04$, and overpriced item prices, $b = .60$, $SE = .16$, $z = 3.76$, $p < .001$.

Category Label Recall

Recall accuracy of category labels is shown in Figure 7. In addition, the relationship between accuracy and curiosity when young and older adults recalled category labels is shown in Figure 8. Participants' curiosity about grocery store item categories and how it impacts

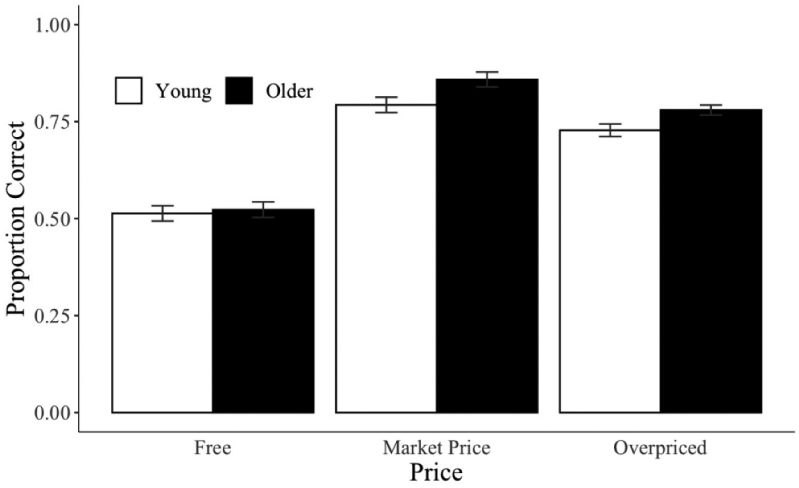

Figure 7. Participants' recall of category labels in Experiment 2. Error bars reflect the standard error of the mean.

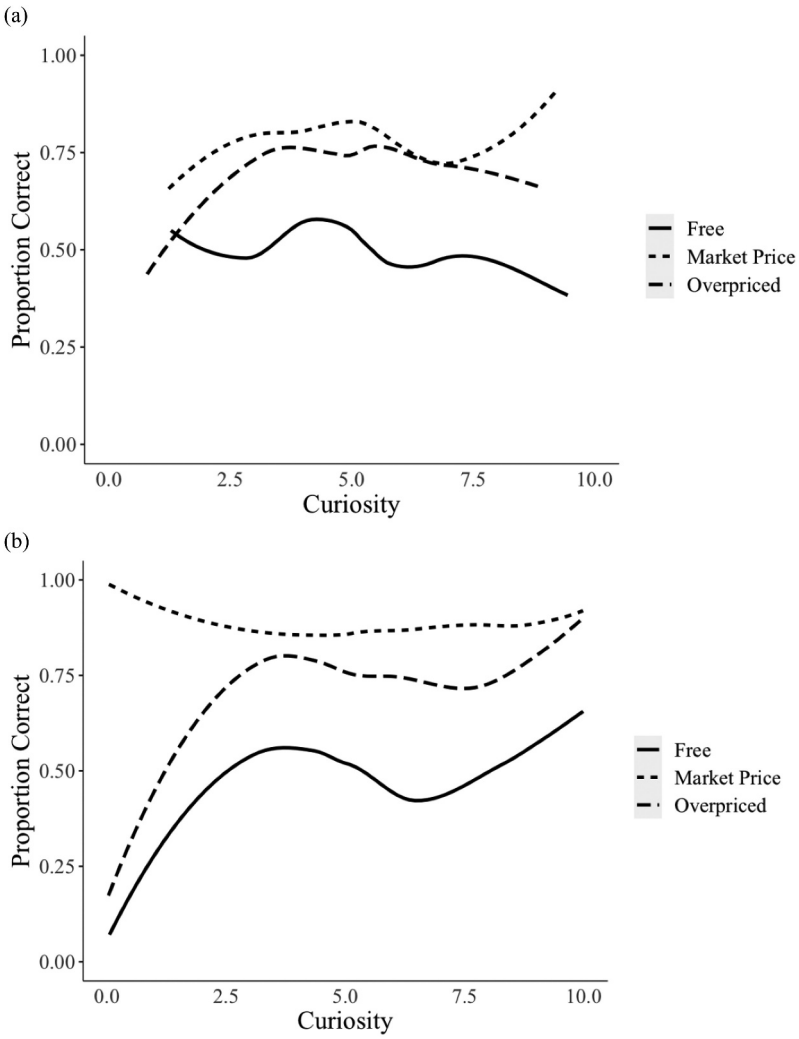

Figure 8. The relationship between young (a) and older (b) adults' curiosity and accuracy in remembering the category labels of grocery items in Experiment 2.

recall of category labels was analyzed by fitting a logistic mixed-effects model using the *glmer* function in R Version 4.3.1 (R Core Team, 2021). The model included a three-way interaction for age (young vs. old) X label (market-priced, free, overpriced) X state curiosity. The model also included trait curiosity as a predictor. Continuous variables (state curiosity, trait curiosity) were standardized (z-scored) within participants before analysis to help facilitate interpretation. All variables were dummy coded with "older adults" as the comparison for age and "free" as the comparison for label. We also included a random intercept for participants and grocery items. To test the simple effects of the model, we compared estimated marginal means and trends of the full model using *emmeans, emtrends*, and *pairs* functions from Version 1.8.4 of the *emmeans* R package (Lenth, 2023).

The model revealed no significant effect of age, $b = .19$, $SE = .22$, $z = .86$, $p = .39$. There was also no main effect of state curiosity, $b = .04$, $SE = .10$, $z = .45$, $p = .65$, nor a main effect

of trait curiosity, $b = .22$, $SE = .14$, $z = 1.58$, $p = .11$. There was a significant effect of label. Participants were more accurate in recalling the market-priced category labels ($M = .83$, $SD = .38$) than the free item labels ($M = .52$, $SD = .50$), $b = 1.76$, $SE = .10$, $z = 17.37$, $p < .001$, and the overpriced item labels ($M = .76$, $SD = .43$), $b = .38$, $SE = .09$, $z = 4.01$, $p < .001$. Participants were also more accurate in recalling overpriced category labels than free category labels, $b = 1.27$, $SE = .08$, $z = 15.05$, $p < .001$. The model also revealed a significant label by age interaction. Older adults were more accurate in recalling market-priced ($M = .86$, $SD = .35$), $b = 2.02$, $SE = .15$, $z = 13.89$, $p < .001$, and overpriced category labels ($M = .78$, $SD = .42$), $b = 1.35$, $SE = .13$, $z = 10.46$, $p < .001$, than free category labels ($M = .52$, $SD = .50$). Older adults were also more accurate in recalling market-priced category labels than overpriced category labels, $b = .67$, $SE = .15$, $z = 4.49$, $p < .001$. Young adults were more accurate in recalling market-priced ($M = .79$, $SD = .41$), $b = 1.50$, $SE = .14$, $z = 10.70$, $p < .001$, and overpriced ($M = .73$, $SD = .45$) labels than free category labels ($M = .51$, $SD = .50$), $b = 1.01$, $SE = .13$, $z = 7.89$, $p < .001$. Young adults were also more accurate in recalling market-priced than overpriced category labels, $b = .49$, $SE = .14$, $z = 3.39$, $p = .009$. There was no difference in young and older adults' recall for free labels, $b = .19$, $SE = .22$, $z = .86$, $p = .96$, or with overpriced category labels, $b = .53$, $SE = .23$, $z = 2.32$, $p = .18$. However, older adults were more accurate in recalling market-priced category labels than young adults, $b = .71$, $SE = .24$, $z = 2.92$, $p = .04$.

The model also revealed a significant label by age by curiosity interaction. There was a positive, but not significant, association between accuracy and curiosity when older adults recalled free category labels, $\beta = .04$, $SE = .10$, 95% CI [−.14, .23]. There was a significant positive association when older adults recalled overpriced items, $\beta = .24$, $SE = .11$, 95% CI [.02, .46]. There was a negative, but not significant, association when older adults recalled market-priced items, $\beta = -.15$, $SE = .13$, 95% CI [−.40, .10]. The model revealed a significant positive association when young adults recalled market-priced category labels, $\beta = .33$, $SE = .13$, 95% CI [.09, .58]. There were positive, non-significant associations between accuracy and curiosity, when young adults recalled free, $\beta = .03$, $SE = .10$, 95% CI [−.16, .23], and overpriced category labels, $\beta = .03$, $SE = .11$, 95% CI [−.19, .24]. There was a stronger association between accuracy and curiosity for older adults recalling overpriced item labels than market-priced labels, $b = .39$, $SE = .15$, $z = -2.67$, $p = .02$. There was no difference in the strength of the association between older adults recalling free and market-priced category labels, $b = .19$, $SE = .14$, $z = 1.39$, $p = .34$, nor free and overpriced category labels, $b = .20$, $SE = .12$, $z = 1.61$, $p = .24$. There was also no difference in association for young adults recalling free and market-priced items, $b = .30$, $SE = .15$, $z = 2.00$, $p = .11$, free and overpriced items, $b = .006$, $SE = .14$, $z = .044$, $p = 1.00$, and market-priced and overpriced items, $b = .30$, $SE = .16$, $z = 1.96$, $p = .12$. The model also revealed there was a stronger association between accuracy and curiosity for young adults than older adults when recalling market-priced items, $b = .48$, $SE = .18$, $z = 2.71$, $p = .007$. There was no difference in the strength of association for young and older adults when recalling free, $b = .009$, $SE = .14$, $z = .07$, $p = .95$, or overpriced category labels, $b = .21$, $SE = .16$, $z = 1.37$, $p = .17$.

Questionnaires

A chi-square test of independence was conducted to examine young and older adults' category choices (free, market-priced, overpriced, no preference) when completing our questionnaire. We then computed a chi-square goodness-of-fit test to see if category

selections differed when collapsed across age groups. First, we aimed to see whether participants found some prices easier to remember than others. The distribution of choices did not differ significantly across age groups, χ^2 (3, $N = 81$) = 3.80, $p = .28$, indicating that young and older adults selected the categories at similar rates. When collapsing across age groups, participants' selections of the four categories differed from chance, χ^2 (3, $N = 81$) = 16.43, $p < .001$. Standardized residuals indicated that overpriced items ($z = 3.02$) were selected more often than expected, and free items were chosen less often than expected ($z = -3.40$).

Next, we examined whether young and older adults found some categories easier to remember than others. The distribution of category choices did not differ significantly across age groups, χ^2 (3, $N = 81$) = 5.03, $p = .17$, indicating that young and older adults selected the categories at similar rates. When collapsing across age groups, participants' selections of the four categories differed from chance, χ^2 (3, $N = 81$) = 25.42, $p < .001$. Standardized residuals indicated that overpriced items ($z = 2.76$) and no preference ($z = 3.02$) were selected more often than expected. Market-priced ($z = -3.40$) and free items ($z = -2.37$) were chosen less often than expected.

We examined whether young and older adults attended to some categories more than others. The distribution of category choices did not differ significantly across age groups, χ^2 (3, $N = 82$) = 4.84, $p = .18$, indicating that young and older adults selected the categories at similar rates. When collapsing across age groups, participants' selections of the four categories differed from chance, χ^2 (3, $N = 82$) = 20.88, $p < .001$. Standardized residuals indicated that overpriced ($z = 2.76$) and no preference ($z = 2.50$) were selected more often than expected. Market-priced ($z = -2.89$) and free items ($z = -2.37$) were chosen less often than expected.

We also examined whether young and older adults found some prices harder to remember. The distribution of choices did not differ significantly across age groups, χ^2 (3, $N = 82$) = .86, $p = .83$, indicating that young and older adults selected the price categories at similar rates. When collapsing across age groups, participants' selections of the four price categories did not differ from chance, χ^2 (3, $N = 82$) = 7.05, $p = .07$, so participants selected the categories similarly. We then examined whether young and older adults found some price categories harder to remember. The distribution of category choices did not differ significantly across age groups, χ^2 (3, $N = 81$) = 7.12, $p = .07$, indicating that young and older adults selected the categories at similar rates. When collapsing across age groups, participants' selections of the four categories also did not differ from chance, χ^2 (3, $N = 81$) = 4.58, $p = .21$, so participants selected the categories similarly. In terms of trait curiosity, as assessed using the five item Epistemic Curiosity Scale, we found no significant differences in young ($M = 26.90$, $SD = 5.56$) and older adults' ($M = 29.88$, $SD = 9.35$) trait curiosity, t (80) = 1.56, $p = .08$. An independent t-test was conducted to examine the differences between the grocery shopping habits of young and older adults. We found no difference between the self-reported amount that young ($M = 7.14$, $SD = 3.12$) and older adults ($M = 6.40$, $SD = 2.54$) shop in stores, $t(82) = 1.20$, $p = .23$. However, older adults ($M = 5.26$, $SD = 3.45$) indicated that they shopped online more than young adults ($M = 2.94$, $SD = 2.88$), t (82) = 3.36, $p = .001$. Participants' grocery shopping habits and how they relate to their recall of exact prices and category labels were analyzed by fitting logistic mixed-effects models using the *glmer* function in R Version 4.3.1 (R Core Team, 2021). The models included a two-way interaction for age (young vs. old) X grocery shopping habits. We calculated

participants' overall grocery store habits by adding each participant's in-store and online shopping scores. Age was dummy coded with "older adults" as the comparison group. We also included random intercepts for participants and grocery items. The model for recall of exact prices revealed that shopping habits were not a significant predictor of price results, $b = .06$, $SE = .05$, $z = 1.18$, $p = .24$. There was also no significant interaction between age group and shopping habits, $b = .10$, $SE = .07$, $z = -1.34$, $p = .18$. The model for the recall of category labels did reveal a significant effect of shopping habits where the more participants indicated shopping, the more accurate they were in their recall of category labels, $b = .06$, $SE = .04$, $z = 1.57$, $p = .12$. There was no significant interaction between age group and shopping habits, $b = .07$, $SE = .05$, $z = -1.46$, $p = .15$.

Discussion

Experiment 2 revealed that higher rates of state curiosity did predict higher rates of recall accuracy of exact prices overall, which is consistent with our hypotheses. For exact price recall, older adults' curiosity more strongly predicted recall accuracy for market-priced and overpriced items than young adults. We found the opposite effect with trait curiosity, where trait curiosity was negatively associated with recall accuracy of exact prices, so the more trait curious participants were, the worse they were at recalling prices. This finding was inconsistent with our hypothesis and previous findings that trait curiosity can provide protective benefits in age-related declines in cognitive abilities (Hargis et al., 2020; Park et al., 2014; Sakaki et al., 2018).

Consistent with Experiment 1, older adults were more accurate in recalling the exact prices of items than young adults. We also found that older adults were more accurate in recalling the exact prices of market-priced and free items than overpriced items, and young adults did not show these differences. There was no difference between older adults and young adults when recalling specific category items. Thus, despite older adults being more accurate in recalling item prices than young adults overall, we did not see these differences when looking at categories, suggesting both groups remember the value categories, consistent with prior work (e.g., Castel, 2005; Flores et al., 2017).

For category label recall, state curiosity and trait curiosity overall did not predict accuracy in Experiment 2. This finding could be explained by participants not having a particular interest or curiosity in whether the items were paired with a specific category label. We speculate that participants would be more interested in learning the exact prices of the items since the prices reflect real prices in the real world and are potentially personally relevant to the participant than whether the experiment arbitrarily paired the items with different category labels (Abele & Gendolla, 2007). Future research should investigate which items participants found most curious and why they were more curious to learn the prices of some items than others, and if curiosity may be related to memory when the value category is presented before the price. We also found no overall age differences in participants' memory of the category items. However, we did find that older adults were more accurate in recalling market-priced category labels than young adults, which was consistent with Experiment 1. Also consistent with the previous experiment, the results revealed that young and older adults recalled more market-priced and overpriced category labels than free category labels. Both age groups also recalled market-priced category labels more than overpriced ones.

Lastly, the questionnaire results showed that participants reported that overpriced item prices and categories were the easiest to remember. Participants also attended to overpriced items the most out of all the items, and this is consistent with Experiment 1. Therefore, in both experiments, participants perceived the overpriced items to be the easiest to remember, despite recalling the overpriced items the least compared to other categories. These findings further highlight the impact that prior schematic information can have on memory recall in both young and older adults, by showing that prior schematic information may be more beneficial for recall performance than one's perception and attention.

General Discussion

The present study aimed to investigate schematic support in associative memory performance by investigating young and older adults' memory for grocery items that are labeled as market-priced, overpriced, and free, and how curiosity may influence young and older adults' memory for price information. Little research has specifically investigated young and older adults' memory for free items, although older adults may show differences in motivation when faced with "free" items, due to incentive to save money and how are often victims of scams involving "free" prize winnings (Federal Trade Commission, 2022; Freund, 2006; Yu et al., 2023). In addition, free products may not always be truly "free." For example, to receive a "free" item, people often are required to provide personal information about themselves or purchase an additional product and provide personal information. This personal information could include one's name, address, e-mail, and credit card information. In some cases, companies have used this information for future promotion of their products (Haan, 2024). Grocery stores also often advertise "free" grocery store products for signing up for the grocery store's card, which often requires giving the grocery store one's personal information (Graeff & Harmon, 2002). Therefore, the framework of the present experiments seemed particularly relevant when investigating "free" items.

In both experiments, older adults were more accurate in recalling the prices of market-priced and free items than overpriced items, which is consistent with prior research (Castel, 2005; Whatley & Castel, 2022). These findings demonstrate how older adults had more accurate memories for prices that were consistent with prior schemas, such as the free and market-priced items. Memory for free items in this experiment would also reflect items that are consistent with prior schemas because, despite the items being free, they were still labeled with their market-priced price, similar to how free items are marked in the real-world. Older adults had worse memory for prices that did not match these prior schemas, such as overpriced items that were manufactured by the researchers and did not reflect actual prices in the real-world.

Overall, Experiments 1 and 2 both showed some results that were consistent with prior research, as well as results that were contrary to our initial hypothesis, such as older adults having more accurate memory performance than young adults. In both experiments, older adults were more accurate in recalling the prices of market-priced and free items than overpriced items; however, young adults did not show this difference. These results suggest that older adults benefited more from prior schematic information of prices than young adults because older adults showed boosts in recall for prices that matched their prior schematic information, and both items that were labeled as "free" and "market-priced" would fit with prior schemas. One possible

interpretation of this is that our young adult sample may not have a strong basis of prior knowledge of grocery store item prices. To examine this further, we conducted an exploratory analysis investigating whether young and older adults differ in the amount that they grocery shop in stores and online. We found that in Experiment 1, older adults shopped in-store and online more than young adults. In Experiment 2, there was no difference between the self-reported frequency in which young and older adults shop in stores. However, older adults reported shopping online more than young adults. These findings are possibly due to the young adult participants in our sample being undergraduate students who may primarily eat in UCLA's dining halls, although students do report that they engage in in-person shopping behavior near and off-campus (Baumgart & Park, 2025; UCLA Student Dining [UCLA], n.d.). Future research should be conducted, controlling for participants' frequency of going to stores and interest in prices based on generational effects and motivation.

Interestingly, young and older adults were similarly accurate in recalling overpriced items, which potentially may represent memory that does not have prior schematic support in terms of remembering these unrealistic prices. Therefore, even when young and older adults did not have prior knowledge of the prices of the items, they performed similarly, which was inconsistent with prior research that typically shows age-related differences in these conditions (e.g., Castel, 2005; Whatley & Castel, 2022). Generally, prior research shows that older adults show associative memory deficits compared to young adults (e.g., James, 2006; Naveh-Benjamin et al., 2004). It may be that in the present study, there were age-related differences in motivation and interest, given the materials in question, and older adults receiving monetary compensation, and the young adults receiving course credit. Young and older adults may have differed in their motivation to attend to and remember the grocery items presented, due to age-related differences in preferences, dietary restrictions, or health concerns (e.g., Drewnowski et al., 1997). Although Experiment 2 included random effects for participants and grocery items to account for unexplained variability across individuals and the grocery items, these analyses do not directly assess whether item relevance differed across age groups. Therefore, we cannot rule out the possibility that age-related differences in curiosity or item relevance contributed to memory performance independently of price schemas. Future research could address this issue more directly by assessing participants' dietary preferences or the perceived relevance of items. In addition, the older adult may have been relatively high functioning and particularly interested in participating in research (e.g., Greene & Naveh-Benjamin, 2022; Hanzal et al., 2025; Ryan & Campbell, 2021). It also may be the case that there are cohort effects, as older adults focus on remembering price information due to years of shopping experience and a focus on saving money, with young adults in more recent years reporting greater memory deficits, possibly due to frequent multitasking or sleep deprivation (Tong & Ryan, 2024). In the present study, we did not include an independent assessment of baseline memory ability in young and older adults. As a result, it is unclear whether the observed age-related differences in the task reflect normative variability or individual differences in memory ability. Although the age-related results were consistent across piloting and both Experiment 1 and 2, since we did not collect independent cognitive measures in our study, this limits our interpretation of the mechanism underlying these effects. Future research should be conducted using a cognitive functioning assessment to help clarify the sources of age-related differences in price memory.

In both experiments, young and older adults reported that they attended to the overpriced item category the most out of the different categories, and they also found overpriced items easiest to recall. Whatley and Castel (2022) found that young and older adults studied overpriced items for longer than market-priced items, but study time did not relate to accuracy, which is relevant to the present study's findings. However, in Whatley and Castel's (2022) study, participants' judgments of learning were higher for market-priced than overpriced items, indicating metacognitive awareness in participants, which seems to be inconsistent with participants rating overpriced items as easier to remember than other categories in the current studies. The present study's findings represent a mismatch between memory performance and one's perception of their memory performance. In addition, participants remembering the market-priced item prices more than the overpriced item prices may show how schematic support may surpass one's attention in enhancing memory performance. Future research should further investigate the interplay between one's self-reported attention when trying to memorize information and how that compares to schematic support in memory.

When investigating category recall, Experiment 1 showed that older adults were overall more accurate than young adults, which may be consistent with older adults focusing on gist-based information (Castel, 2005; Flores et al., 2017; Gallo et al., 2019). Specifically, in Experiment 1, we found that older adults were more accurate in remembering the category labels for market-priced and overpriced items than young adults. In Experiment 2, there were no specific age differences in category recall, suggesting that both younger and older adults could remember this gist information. Future research should investigate these findings further to determine how older adults remember gist-information when schemas are, and are not, consistent with remembering prices, as well as interest in purchasing these items, which may be related to curiosity in learning the prices.

In both experiments, young and older adults were also more accurate in recalling market-priced and overpriced category labels than free category labels. These findings were inconsistent with young and older adults' questionnaire responses, as both age groups deemed overpriced items as the easiest to remember. We initially hypothesized that older adults would be more accurate in recalling free items than other categories, possibly due to older adults falling for free scams (Federal Trade Commission, 2022). However, we theorize that in this study, young and older adults may have been treating free items as a truly "free" item, meaning they would not need to attend to them as much because they would be getting the item for free. The item would not be costing them any expense; therefore, it would not be as critical to remember (Castel, 2024; Murphy & Castel, 2021). This could effectively act as a directed forgetting cue, leading people to use a strategy to forget these prices (e.g., Bowen et al., 2020; Hennessee et al., 2024; Sahakyan et al., 2008). This potential explanation may also explain why participants particularly attended to and remembered overpriced item categories more than free items, because in the real world, overpriced items may be an item you would want to avoid when looking to purchase an item, because it is expensive (Rummo et al., 2022). Therefore, overpriced items would be costly to forget. Future research should investigate these theories more by exploring participants' thought processes and motivation behind trying to remember some categories more than others.

In Experiment 2, we investigated young and older adults' curiosity in learning the prices of items and how curiosity may facilitate enhancements in memory performance and found that state curiosity was predictive of participants' accuracy in recalling the exact prices of the items. We found that older adults give higher ratings of state curiosity relative to younger adults. We

also found that older adults' curiosity was more predictive of their performance accuracy for recalling market-priced and overpriced items than that of young adults. Therefore, older adults seemed to benefit more from their heightened curiosity when viewing these items than young adults. These findings may provide further evidence that state curiosity may be a motivating factor that boosts memory and helps older adults overcome age-related cognitive deficits (Castel, 2024; Hargis et al., 2020; Zacks & Hasher, 2006). Heightened state curiosity also may be guiding older adults to selectively remember information that they are particularly curious about at the item level and also have some personal relevance (Castel, 2008, 2024; Chu & Fung, 2022; McGillivray et al., 2015). In some cases, older adults' curiosity has a greater relationship to memory performance than young adults, such as when tested after a significant delay (McGillivray et al., 2015). In general, we found that state curiosity was greater for older adults than younger adults, which may be related to motivation and interest regarding the materials and task. Overall, the findings from Experiment 2 support some prior research, and extend this area of research to show how curiosity can guide memory for prices in older age, providing a mechanism that may remain intact in older age.

Interestingly, trait curiosity was negatively associated with recall accuracy of exact prices, so the more trait-curious participants were, the worse they were at recalling prices. This finding was inconsistent with our hypothesis and previous findings that trait curiosity can provide protective benefits in age-related declines in cognitive abilities (Hargis et al., 2020; Park et al., 2014; Sakaki et al., 2018). One possible reason for this effect could be driven by age differences. Trait curiosity has been shown to decline with age, meaning that older adults are generally less trait curious than young adults (e.g., Chu et al., 2021; Whatley & Castel, 2022). Therefore, older adults' better recall accuracy in this task may help explain the negative association we observed between trait curiosity and accuracy. In other words, the negative relationship may be driven by age differences, or older adults scoring lower on curiosity, but higher on accuracy, rather than reflecting a true association between trait curiosity and accuracy. However, for exploratory purposes, we included an interaction between trait curiosity and age group and found no significant relationship between the two variables in our study ($b = -.30$, $SE = .41$, $z = -.72$, $p = .47$). We did not include this interaction in our final model, because it did not significantly improve the model, and thus we elected to use the simpler model for our analysis.

One limitation of the present study is that participants were tested in a controlled laboratory environment with fixed study time durations and immediate recall of the price information. Therefore, this study does not fully capture real-world consumer habits where price information is encoded incidentally and remembered over longer time periods. Nevertheless, the present findings may be informative for understanding memory processes when consumers deliberately attend to price information, such as comparing prices between different grocery stores or determining the potential amount saved from a sale or coupon. In this context, the results highlight both young and older adults' enhanced memory for price information that is consistent with prior schematic knowledge (market-priced and free items), as well as greater difficulty remembering prices that violate these schemas (overpriced items). The present study also conceptualized "free" as a categorical label rather than a numeric value to be encoded. Therefore, memory for free items in the task may not reflect real-world settings, as consumers are generally unlikely to encode the original market price of a free item because the free item would now be $0. Future studies could explore how participants encode the numeric value of free items more specifically. Another limitation of the present study is that we did not collect information on

participants' socioeconomic status. Participants' socioeconomic status (SES) has the potential to affect participants' perception value and sensitivity to free offers (e.g., Ajetunmobi & Laobangdisa, 2024; Larson & Story, 2009), which could affect participants' attention and memory to price-related information in the study. Since SES was not measured, we cannot determine whether individual differences in financial security moderated participants' memory performance. Future research should incorporate SES measures to examine whether socioeconomic factors influence memory performance for priced items.

The present study highlighted some important issues regarding age-related changes in attention, memory, and schematic support, as these can have important implications for how young and older adults remember information. This study showed how older adults were better at remembering the exact prices of information that were consistent with prior schematic information compared to price information that strayed from schemas. This included older adults having better memory for "free" and "market-priced" items that were paired with realistic market-priced prices and worse memory for overpriced items that were associated with arbitrary overpriced item prices. These findings may suggest that schematic support may be a more powerful resource than selective attention in aiding memory performance. The present work also showed that when young and older adults were more curious to learn the prices of items, the more accurate their memory performance was for these items in the current task. This may be especially apparent for older adults, suggesting that some forms of curiosity may be a motivating factor that can help older adults overcome age-related associative memory deficits, and when coupled with schematic support, can be a useful way to remember relevant information.

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Data Availability Statement

The stimuli, data, and analysis code are available at https://osf.io/t62fr/ on the Open Science Framework.

Originality Statement

The ideas and data appearing in the manuscript have not been disseminated before.

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