Effects of Processing Style and Age on Schema Acquisition

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Age differences in schema acquisition were examined using a task in which participants read paragraphs about a character and learned to predict his behavior. Successful performance depended on learning which information in the paragraphs was related to the behavior. Because these predictive traits were arbitrarily selected, prior experience was of no benefit. Twenty-eight young adults (ages 18 to 25) and 28 older adults (ages 60 to 80) participated in this experiment. The young adults performed better overall than the older adults. However, when we reexamined the data by considering processing style (i.e., whether individuals relied on a data-driven or conceptually driven processing style), we found that young and older adults who tested specific hypotheses were similar, whereas the older adults who tried to rely on general impressions performed poorly. Findings indicate that it is critical to determine how people approach cognitive tasks and that some older adults are likely to engage in conceptually driven processing regardless of its relevance to a particular task.

Knowledge structure is an interconnected set of information and concepts that is based on prior experience. Such structures allow for information to be organized and linked, as opposed to being stored in singular, unconnected nodes. Because of this organization, knowledge structures are thought to aid the understanding of events and the prediction of future events based on particular sets of circumstances and to allow for the inference of missing information. The study of the acquisition of knowledge structures or schemas is important—rarely do people learn a series of facts or lists of words in isolation from one another. Instead, in most instances they integrate and relate different pieces of information into a larger unit.

From a life span developmental perspective, there has been little systematic investigation regarding older adults’ abilities to develop new knowledge structures aside from work by Hess and his colleagues (Hess, Pullen, & McGee, 1996; Hess & Wallsten, 1987) and research on classification and categorizations done in the 1970s (e.g., Cicerelli, 1976; Kogan, 1974). An investigation of age-related differences in the acquisition of new knowledge structures will lead to a greater understanding of how older adults learn and synthesize new information. In addition, it is important to assess the manner in which people attempt to acquire new information. For example, are older adults more likely to rely on prior experience (i.e., a conceptually driven style) than young adults, who, because of greater cognitive resources and less world experience, prefer to test specific hypotheses (i.e., a data-driven style)?

In a recent study, Hess and colleagues (1996) assessed age differences in the acquisition of a schema for a social group using a technique developed by Mayer and Bower (1986). In this task, participants read short paragraphs about a series of individuals and learned to predict which of two groups each individual belonged to. The classification was based on the concurrence of particular traits within different dimensions of information (e.g., physical appearance, temperament, and family background) in the same paragraph. Successful performance depended on participants learning which of these traits predicted group membership. Hess and colleagues found no age-related declines in performance for the condition in which participants could rely on evaluative content (i.e., the positive or negative affective valence of the traits). In fact, the older adults outperformed the young adults in the positive prototype condition. However, the young adults performed better than the older adults in the arbitrary condition in which participants had to learn the particular features of each instance and could not rely on knowledge acquired outside the laboratory.

Hess and colleagues (1996) found that there were age differences in how young and older adults performed the acquisition task. This conclusion was based on (a) an age-related decline in performance for the arbitrary but not for the evaluative conditions and (b) self-report data indicating that many of the older adults approached the task differently from the young adults. After completing the task, participants reported whether they relied on general impressions or tested specific hypotheses to make the prediction. Older adults were more likely to report that they relied on general impressions to perform the task, whereas young adults were more likely to report testing specific hypotheses. Therefore, the evaluative condition facilitated older adults’ performance because forming a general impression was an effective technique, whereas it was not an effective style when the predictive information was arbitrary.

Several researchers have suggested qualitative differences in processing styles between young and older adults. Older adults may tend to rely on general impressions or conceptually driven processing regardless of task relevance, whereas young adults may engage in a more analytical or data-driven approach (Hess, 1990; Hess et al., 1996; Labouvie-Vief & Schell, 1982; Willis, 1996). The basis for this
hypothesized processing style shift varies from it being a consequence of declining cognitive abilities to the argument that the change is the result of increased experience over the life span (see Willis, 1996, for a review). However, there is little research on the likelihood or prevalence of this processing style change. Nor is there an understanding of how processing style differences may mediate age-related performance differences on cognitive tasks.

The primary focus of the present experiment was to develop a more detailed understanding of age differences in processing style and in the acquisition of a new knowledge structure using an arbitrary-type experiment similar to that of Hess and colleagues (1996) and originally developed by Mayer, Rapp, and Williams (1993). The arbitrary condition has one important advantage over the evaluative condition, which is that the role of prior knowledge can be minimized by randomly selecting what information is predictive of the classification. This ensures that successful performance is based on the learning and integration of new information. In fact, reliance on prior experience will, in all likelihood, interfere with learning to make the prediction. The arbitrary condition was used to examine whether there are age differences in schema acquisition and whether an age-related shift in processing style could be responsible for such differences.

We adapted the personal-action schema task developed by Mayer and colleagues (1993) for use in the present experiment. In the Mayer and colleagues paradigm, participants read short paragraphs about a male character and learned to use this information to predict his future actions, such as starting an argument or watching television, based on the particular features presented in the narration. The paragraphs contained dimensions that described such aspects as the character’s appearance, gestures, and expressions. Each dimension could be expressed by one of four traits. For example, for a dimension referring to the character’s hands, the traits might be “are by his side,” “are in his pockets,” “are nervous,” or “are fidgeting.” One trait was selected arbitrarily for each dimension as being predictive of the target behavior. The other three traits for each dimension were then designated as distractors and did not predict the behavior. In this way, a particular paragraph may contain a varying number of predictive traits. However, there were no necessary and sufficient traits that predicted the target behavior. Instead, the behavior occurred when over half of the dimensions contained predictive traits. This meant that on some occasions, there were predictive traits, but no occurrence of the behavior because the threshold was not met. Mayer and his colleagues used this fuzzy category technique to parallel the underlying nature of real-life judgments, because people often predict events based on the interplay of multiple traits rather than on a single trait.

We adapted the Mayer and colleagues (1993) protocol to have 5 dimensions (instead of 16), with four traits per dimension. Thus, the decision rule required three or more predictive traits to appear in a paragraph for the character to watch television. We opted to use only the television scenario, and we also provided 20 more schema acquisition trials, for a total of 80. Our adaptation of the Mayer and colleagues paradigm was designed to better assess schema acquisition for older adults by reducing the task demands and providing many acquisition trials.

Performance during acquisition was only one of the dependent measures in our study. We also assessed the degree of schema detail acquired by examining the ability to discriminate between predictive traits and nonpredictive traits and the ability to select the predictive trait from among all traits with each dimension on a multiple-choice test. These measures provide indices regarding the nature of the developed schema and accessibility of detail. Thus, the schema detail tests enabled us to determine the quality of the schemas acquired by young and older adults.

We also investigated age differences in the processing styles used during the schema acquisition task. Participants described in their own words how they performed the schema acquisition task, and these responses were coded according to whether the responses were based on a data-driven style, a conceptual style, or a combination of both styles. This allowed us to test Hess and colleagues’ (1996) finding that older adults may tend to perform a task by relying on general impressions rather than analytical methods. In addition, we developed a critical extension of the Hess and colleagues research by reexamining the schema data to determine whether self-reported processing style was actually related to performance. It is insufficient to examine whether there are self-reported age differences in processing style without considering how processing style affects performance. A more complete picture will emerge by testing whether individuals who reported a data-driven style actually performed better than those adults who relied on a conceptually driven style or general impressions, as would be predicted. Further, do older adults who evidence a data-driven processing style look more like older adults who use a conceptually driven style or like young adults who use a data-driven style? One possibility is that processing style could emerge as a more informative and meaningful predictor of performance than age.

We hypothesized, based on Hess and colleagues’ (1996) earlier findings, that (a) overall, young adults would perform better than older adults on the schema acquisition task and schema detail tests; (b) older adults would be more likely than young adults to rely on general impressions to make predictions (i.e., a conceptually driven style); and (c) data-driven processing, regardless of age, would be associated with better performance on the schema tasks than would conceptually driven processing.

Methods

Participants

Twenty-eight young college students (age 18–25 years; 11 men, 17 women) and 28 community-dwelling older adults (age 60–80 years; 12 men, 16 women) participated. Young adults received course credit, and older adults received $25. All participants had at least 20/40 corrected vision. The self-ratings for health (on a scale ranging from 1 = poor to 6 = excellent) for both age groups were in the good to excellent range, with mean ratings of 5.04 (SD = 0.69) for the young adults and 4.32 (SD = 1.54) for the older adults, although this age difference was significant, t(54) = 2.27, p < .05.
Younger respondents completed more items on the Digit Symbol Substitution test (Wechsler, 1981; \( M = 72.86, SD = 8.45 \)) than the older adults (\( M = 48.93, SD = 8.27 \)), \( t(54) = 2.24, p < .05 \). The young adults (\( M = 40.26, SD = 11.03 \)) also had higher absolute working memory spans as measured by the alphabet span test (Craik, 1986) than the older adults (\( M = 24.14, SD = 8.11 \)), \( t(53) = 6.19, p < .05 \). The older adults, however, had higher scores on a vocabulary test (Ekstrom, French, Harman, & Dermen, 1976; \( M = 28.82, SD = 8.91 \)), than the young adults (\( M = 21.32, SD = 8.03 \)), \( t(54) = 3.31, p < .05 \), and more years of education, \( t(53) = 2.01, p < .05 \) (older adults: \( M = 15.78, SD = 3.68 \); young adults: \( M = 14.29, SD = 1.33 \)).

Procedure
Participants were tested in one session that lasted approximately 90 min for young adults and 2 hr for older adults. One to four participants were tested in each session. Participants first completed demographic information and the ability tests listed above before performing the schema tasks. Each of the schema-related tasks is described below. The schema acquisition task was performed first, followed by the trait test, the decision rule questionnaire, and finally the multiple-choice test.

Apparatus
The schema acquisition and trait tests were administered on IBM-compatible personal computers. The tests were programmed in MEL (Micro-Experimental Laboratory; Schneider, 1988). Participants responded yes or no for the schema acquisition test by using the \( y \) and \( s \) keys, which had been relabeled \( Y \) and \( N \), respectively, on an extended keyboard. Responses on the trait test were made by using the number keys, 1 through 6, at the top of the keyboard.

Schema Acquisition
The schema acquisition task was adapted from Mayer and associates (1993). Participants read 80 short paragraphs about a fictitious character, A.L., with the goal of learning to predict whether he would watch television. The experimenter read the following instructions along with each participant:

Your job in this experiment will be to learn about a person named A.L. We will show you some examples of A.L., and in the examples, A.L. sometimes watches television and sometimes does not. We would like you to learn enough about A.L. to predict when he will watch television. So each time you read about A.L. we want you to try to guess whether he will watch TV. The first few times you will really be guessing because you won’t know anything about A.L. at all. We will tell you each time whether A.L. watched television. So after a while you really will be able to make a prediction. Try to learn as much as you can and don’t worry how well you are doing, but try to do your best. You will read 80 paragraphs and have an opportunity to take a short break after each 10 paragraphs. Accuracy is more important than speed so please take your time in making a decision.

The paragraphs were presented individually on a computer screen, along with the question “Is A.L. going to watch television? (Yes or No).” Participants selected their response by pressing the \( Y \) or \( N \) key. After each trial, the participants’ response selection and accuracy were presented on the screen.

One trait within each dimension was selected arbitrarily as predictive of watching television. The decision rule was that when at least three predictive traits appeared in a paragraph, the character watched television (i.e., the behavior was present).

Paragraphs were constructed in blocks of 20, with 10 being behavior-present and 10 being behavior-absent. For the behavior-present paragraphs, one contained all five predictive traits, four contained four predictive traits, and five contained three predictive traits. For the behavior-absent paragraphs, one contained no predictive traits, four contained one predictive trait, and five contained two predictive traits. Presentation order within a block was randomized. According to this technique of stimulus design, each predictive trait occurred in 72% of the behavior-present paragraphs and 28% of the behavior-absent paragraphs. In contrast, the nonpredictive traits each occurred in 9% of the behavior-present paragraphs and 24% of the behavior-absent paragraphs. All paragraphs were unique except for the one containing all five predictive traits because it could not vary.

To minimize the likelihood of effects on learning caused by particular traits being more or less salient than others, four counterbalanced groups were developed for the experiment by rotating the predictive traits. For Group 1, the predictive traits were the first trait in each dimension shown in the paragraph skeleton below. For Group 2, the predictive traits were the second trait within each dimension, and so on, through Group 4. Seven young adults and seven older adults were in each group. The paragraph skeleton was as follows:

A.L.’s hands are [by his side/fidgeting/in his pockets/nervous]. His eyes are [blinking/glazed/shifty/sparkling]. It is [Monday/Tuesday/Wednesday/Thursday] [late morning/afternoon/evening/late at night]. He has had a(n) [uneventful/hectic/lousy/great] day.

Trait Test
The trait test was a computerized presentation of each trait (e.g., “His eyes were blinking”), and participants were asked to judge its relatedness to watching television. Each trait was rated on a scale ranging from 1 (not related to watching television) to 6 (definitely related to watching television). The 20 individual traits (i.e., 4 traits for each of the five dimensions) were presented in random order. There was no time limit for this task.

Decision Rule Questionnaire
Participants were provided with the question “What was the rule you used for deciding when A.L. would watch television?” on a sheet of paper. They were asked to describe in their own words how they made decisions and were provided as much time as they needed.
Multiple-Choice Test

In this paper-and-pencil test, each dimension (e.g., “His eyes were...”) was presented along with its four possible traits listed alphabetically. The instructions stated that for each dimension, one trait was predictive of A.L.’s watching television. Participants were asked to select the predictive trait.

RESULTS AND DISCUSSION

Schema Acquisition

The left panel of Figure 1 presents the percentage of correct responses by age and practice set for Experiment 1. Because there were no significant differences among the counterbalanced groups within each age group, the data have been combined for analyses. An Age × Practice Set analysis of variance (ANOVA) revealed that the performance of the young adults was significantly better than that of the older adults, \(F(1, 54) = 4.60, p < .04, \text{MSE} = .13\). Performance also improved with practice, \(F(3, 162) = 5.33, p < .01, \text{MSE} = .07\). Although the Age × Practice Set interaction was not significant \((p = .09)\), post hoc comparisons between initial performance (i.e., Practice Set 1) and final performance (i.e., Practice Set 4) revealed significant improvements for the young adults, \(t(27) = 3.51, p < .01\), but not the older adults \((p = .52)\).

This analysis of the acquisition data suggests that the young adults performed better than the older adults did overall. In fact, the older adults showed little evidence of improving from the first practice set to the final practice set. On a surface level, an age difference favoring young people on a cognitive task is not especially surprising. The question becomes whether the findings from these data truly represent older adults as a whole or if the poor performance of some older adults is skewing the group average. As discussed previously, researchers (e.g., Hess, 1990) have proposed that processing style may play a role in age differences on cognitive tasks (see also Rogers & Gilbert, 1997). Therefore, the possibility that the older adults may have shifted to a more conceptual, experienced-based style merits consideration. Given that the construction of this task did not allow for a benefit of prior experience for acquiring an appropriate schema, a conceptual approach would not result in a performance improvement. The primary means to successful performance would be a data-driven approach in which the specific relationships among the traits in the paragraphs are examined. The decision rule questionnaire allowed us to examine differences in processing style and to compare individual differences in processing style to success in performing the task.

Decision Rule Questionnaire

Participants’ responses on the questionnaire were coded by two judges, who were unaware of the ages of the participants. The judges assessed whether participants listed any characteristics of a data-driven processing style (e.g., testing specific hypotheses about when A.L. would watch television) as well as whether they listed any characteristics of a conceptually driven processing style (e.g., basing a decision on information not provided in the paragraphs, such as trying to determine A.L.'s mood in each situation). The processing style classification was made without consideration of whether the rule participants provided was accurate. Participants were considered to be using data-driven processing if they cited using specific information (i.e., the traits or dimensions presented in the paragraphs) to make a prediction (e.g., “When it was Tuesday, I said yes, and when his hands were nervous I said no.”). Participants were considered to be using conceptually driven processing if they cited using inferences about the character’s general state or motivation.
(e.g., “when he feels depressed”) to make a prediction. This processing style classification was modeled after a procedure used by Mayer and colleagues (1993), while also considering the processing style distinction of Hess and associates (1996) with regard to testing specific hypotheses versus forming general impressions. The processing style classification for a given participant could be coded as both data and conceptually driven. That is, it was possible for participants to have demonstrated aspects of both styles if they made inferences about behavior and noted using specific traits to make a decision. The percentage agreement between the judges for each of the categorizations was 96% for whether the response was indicative of data-driven processing and 86% for whether it was indicative of conceptually driven processing. After the initial phase of coding, the judges reached a consensus on all discrepancies.

On the basis of processing style codes, there were four possible ways people could have been classified: (a) data driven alone, (b) conceptually driven alone, (c) both data driven and conceptually driven, or (d) neither processing style. The neither category pertained to respondents who did not provide enough information to make a classification (e.g., “I had no idea when A.L. would watch television.”). Table 1 presents the number of young and older respondents classified in each of the four processing style groups. Table 2 presents responses of young and older adults for the data-driven, conceptually driven, and both processing style categories. In general, older adults were less likely to cite aspects of a data-driven style than the young adults, $\chi^2(1, N = 56) = 8.31, p < .04$. When the data-driven and both style groups are combined, 27 out of 28 (96%) young adults cited aspects of data-driven processing, whereas only 19 (68%) of the older adults did so.

There were fewer self-reported data-driven processors among the older adults than among the young adults. However, many older adults appeared to have approached the task in a data-driven style. That is, over half of the older adults were engaging in a data-driven style to some degree. An important consideration is how performance is related to the reported processing style. On the basis of the processing style hypothesis, there are two questions of particular interest: (a) Did data-driven processors look alike regardless of age and (b) did older adults who reported a data-driven style outperform members of their cohort who did not? For the subsequent analyses, the participants who were categorized as using neither style were omitted from analyses because their data could not be meaningfully interpreted with respect to the processing style hypothesis. However, the data for these participants have been presented for comparison purposes for each measure.

Table 1. Frequency of Each Processing Style by Age Group Based on Qualitative Coding of the Decision Rule Questionnaire

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<thead>
<tr>
<th>Processing Style</th>
<th>Young Adults</th>
<th>Older Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data driven</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>Conceptually driven</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Both data driven and conceptually driven</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Neither data driven nor conceptually driven</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

### Schema Acquisition Revisited

The schema acquisition data are presented according to age and processing style in the right panel of Figure 1. As described above, the acquisition data revealed an overall performance advantage for the young adults. However, the omnibus analyses regarding age differences in performance did not reveal a complete picture of learning. In fact, it appears that regardless of age, participants who engaged in a data-driven processing style performed the best. This finding is supported by an Age × Set repeated measures ANOVA for data-driven processors only. There was a significant effect of set, $F(3, 26) = 6.66, p < .01, MSE = .01$, but neither the age difference ($p = .79$) nor the Age × Set interaction ($p = .79$) were significant. In fact, follow-up analyses revealed no significant differences between young and older adult data-driven processors for any of the sets ($all ps > .45$).

The second critical test was whether older adults who engaged in data-driven processing attained higher levels of performance than older adults who did not engage in this processing style. This difference was found with the older adult data-driven processors performing better than older adults who engaged in either conceptually driven processing or some combination of both styles. A Set × Processing style (data driven, conceptually driven, or both styles) repeated measures ANOVA revealed only a significant effect for processing style, $F(2, 20) = 5.85, p < .01, MSE = .03$.

We also determined how young and older adults in each processing style classification fared compared with chance performance. Young adult data-driven processors were above chance for Practice Sets 2, $t(16) = 2.69, p < .02$; 3, $t(16) = 3.82, p < .01$; and 4, $t(16) = 3.86, p < .01$. In addition, young adults in the both classification were above chance for Sets 3, $t(9) = 4.94, p < .01$, and 4, $t(9) = 2.71, p < .02$. The only older adults who performed above chance were the data-driven processors; they surpassed chance during Sets 3, $t(10) = 4.05, p < .01$, and 4, $t(10) = 2.73, p < .02$.

On the basis of a reexamination of the acquisition data, we found no support for a generalization that all older adults fail to perform as well as young adults. Instead, the processing style classification is a more useful performance predictor than age. The schema detail tests are examined next to further explore this idea.

### Schema Detail Tests (Trait Test and Multiple-Choice Test)

The schema detail tests were administered after participants had completed the 80 acquisition trials and were used to investigate whether participants had learned some of the specific roles of the traits (i.e., predictive and nonpredictive traits). In the trait test, participants rated each trait as to whether it was related to A.L.’s watching television. If participants had learned at least some of the roles of the traits, then predictive traits should have received higher ratings than nonpredictive traits because higher ratings were indicative of relatedness to watching television. Table 3 presents mean ratings by age, processing style, and trait type. As in the schema acquisition analyses, the data-driven processors for each age group were compared. In general, the data-driven processors differentiated between the trait types re-
Regardless of age. According to an Age × Trait Type (predictive or nonpredictive) ANOVA using only the data-driven processors, there was a main effect for trait type, with the predictive traits being rated higher than the nonpredictive traits, \( F(1, 26) = 17.63, p < .01, \text{MSE} = .62 \). However, there was not an age main effect \((p = .42)\), nor was there an Age × Trait interaction \((p = .89)\).

The other critical analysis was to examine differences among the older adults. Despite the lack of differences between young and older adult data-driven processors, there were indications that processing style differences among the older adults affected trait differentiation, by virtue of a Processing Style × Trait Type interaction, \( F(2, 20) = 4.04, p < .03, \text{MSE} = .38 \). Follow-up analyses were not powerful enough to isolate the source of the style difference effect. The trend, however, was that the older adult data-driven processors differentiated between the trait types more than did the other older adults.

In the multiple-choice test, each dimension was presented along with its four possible traits, and participants selected the trait that predicted A.L. would watch television. The measure of schema detail was how many predictive traits were correctly selected. Figure 2 presents the percentage correct by age and processing style. Findings from the multiple-choice test converge with those of schema acquisition and the trait test in that a data-driven processing style resulted in the best performance. As in the previous analyses, the data-driven processors in each age group were compared, and the age difference was not significant \((p = .07)\). With regard to the older adults only, there were no significant differences either, according to an ANOVA \((p = .29)\). Further analyses were conducted to determine who achieved performance levels that were above chance (i.e., 25%). For the young adults, data-driven processors as well as those who reported a combination of both processing styles were above chance, \( t(16) = 9.35, p < .01 \), and \( t(9) = 2.76, p < .02 \), respectively. For the older adults, only the data-driven processors performed above chance, \( t(10) = 3.15, p < .01 \). Statistical power and high variability among the other older adult groups limited interpretation of their data.

**Conclusion**

Two important findings emerged from this experiment. First, there was evidence that some older adults did rely on conceptually driven processing even though it was not an optimal approach for the task. This potential processing style difference was far from universal for the older adults. In fact, the majority of older adults were classified as relying on data-driven processing to some extent, whether it was their sole style or used in conjunction with conceptually driven processing. The processing style classifications were strikingly similar to those of Hess and colleagues (1996). In the present study and Hess and associates’ arbitrary condition, about 67% of the older adults engaged in data-driven processing or a combination of data- and conceptually driven processing. The data for the young adults in the two studies were also comparable, with only 1 young participant in either study using solely conceptually driven processing. On the basis of these sets of data, the processing style shift is not inevitable, and one goal for future research would be to find ways to predict who is likely to become overly reliant on the conceptual style. As described by Willis (1996), researchers have enumerated a variety of reasons a shift might occur, from reduced cognitive abilities to a preference for relying on past experience. There are a number of different hypotheses that merit consideration. (Note that ability–perfor-

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<th>Young Adults</th>
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<tbody>
<tr>
<td></td>
<td>Predictive Traits</td>
<td>Nonpredictive Traits</td>
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<td>17</td>
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<td>Conceptually driven</td>
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<td>Both data and conceptually driven</td>
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<td>4.40</td>
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<td>Neither data nor conceptually driven</td>
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<td>—</td>
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*Note: Responses were made on a scale ranging from 1 (not related to watching television) to 6 (definitely related to watching television).*
EFFECTS OF PROCESSING STYLE AND AGE

Performance correlations computed for our data did not reveal any clear patterns, but these analyses were limited by the relatively small sample for correlational analyses. As a caveat, because processing style was assessed after completing the schema task, it is impossible to determine if people maintained a particular processing style profile throughout the task or varied it during acquisition. For example, perhaps some older adults initially tried to perform the task analytically and, after failing to improve, decided to use a conceptual style. In a similar vein, this may also explain why the young adults who reported a combination of both processing styles performed much like the data-driven group: Perhaps some young adults began with a conceptual style before realizing that a data-driven style was most appropriate. The present experiment has clearly demonstrated that there was a relationship between processing style and performance, but we cannot specify if the style reported at the end of the experiment represents the style used throughout the schema acquisition task. With regard to future research, one potentially useful technique would be to probe participants by having them complete the decision rule questionnaire at various points during schema acquisition, particularly after completing only a few trials.

The second prominent finding from the analyses is the notion that the data for the young and older adults who relied on data-driven processing were quite similar. Regardless of age, participants who reported testing specific hypotheses about when A.L. would watch television achieved the highest levels of success on the acquisition and detail tests in most cases. This finding is contrary to the picture that emerged from analyses based solely on the young versus older adult classification. The use of a processing style classification helped illuminate a consistent pattern of results that otherwise would have remained masked. Had processing style not been considered, the results of this experiment would have provided an exaggerated depiction of older adults’ difficulties in acquiring new schemas. Instead, what we are left with are questions about how older adults who have shifted in processing style can be induced or aided to approach new tasks in a style that most benefits the particular task. For example, one question is whether older adults can be directed explicitly to engage in a data-driven style. Perhaps the instructions from the present task were not explicit enough in this respect, and, left to their own devices, some older adults chose to rely on past experience to determine the causes of the character’s behavior. The prevalence of a processing style shift merits examination in other task domains aside from social judgments as well.

In conclusion, we have demonstrated that studying the manner in which people approach a task is vital to understanding what people will be able to learn. A richer, more complete picture of cognitive aging will emerge by coupling the examination of performance with individual differences in how people approach a task. Future research must focus on why some individuals engage in processing styles inappropriate to a task and how older adults can be guided, through instruction or design, to develop appropriate knowledge structures. Finally, given the cross-sectional nature of the data, we cannot determine whether the older adults had actually shifted in style as they aged. However, relative to the young adults, there were fewer older adults who engaged in data-driven processing. Further research will be required to determine if older adults actually shift in processing style or, due to cohort differences, have maintained the same style throughout their lives.

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