Aging and Impression Formation:
The Impact of Processing Skills and Goals

Thomas M. Hess, Katherine J. Follett, and Karen A. McGee

Department of Psychology, North Carolina State University.

Two studies assessed age differences in representations and judgments about people. Our specific interest was in examining how presumed age-related changes in processing efficiency and motivation affected performance in an impression formation task. Consistent with age-related declines in processing efficiency, we found that increasing age was associated with: (a) no change in the processing of evaluative information; (b) less use of specific traits to organize impressions; (c) poorer memory for behavioral information, especially when it contradicted expectations; and (d) less systematic relationships between memory and judgments. We also found, however, that more meaningful task goals and a focus on individual behaviors resulted in reduced age differences in the nature of representations about the target person.

A PRIMARY goal in the study of social cognition involves understanding how people represent information in social contexts. A major assumption in such work is that representations provide the bases for both thinking about others and determining one's own behavior, implying that between-person variability in behavior can be partially accounted for by variations in underlying representations. Thus, one research objective has been to understand the factors underlying representational variability. An important factor that appears to be associated with such variability in adulthood, but that has been neglected by mainstream social cognition research, is age. Students of adult development have recently become interested in studying the relationship between social-cognitive functioning and aging in order to understand if age is meaningfully related to changes in representations in adulthood and, if so, what the basis is for this relationship (Blanchard-Fields, 1996; Hess, 1994).

One approach that addresses these questions has been to examine age differences in person memory and impression formation. In the prototypical task, participants are asked to form an impression about a target person based upon a set of behavioral information. Impression ratings and memory for specific behaviors are then used to examine age differences in representations. Hess and his colleagues have conducted a number of such studies, demonstrating that age differences in memory for inconsistent over consistent information are related to age differences in representation in at least one case (Hess & Tate, 1992).

Decline in memory for unexpected information, it has been speculated (Hess, 1994) that the observed age differences in person and event memory are related in part to changes in the efficiency of working memory processes. Specifically, it has been hypothesized that the often-observed superiority of memory for inconsistent over consistent information (herein referred to as the inconsistency effect) in younger adults is due to the extensive processing engaged in when encountering unexpected information as participants seek to explain (Hastie, 1984) or examine these behaviors in relation to other behaviors with evaluative implications (Srull & Wyer, 1989). Such processing puts demands on cognitive capacity, as demonstrated by the fact that the inconsistency effect is substantially reduced when cognitive capacity is occupied (e.g., Srull, 1981). Thus, the fact that older adults have specific problems remembering unexpected information may implicate problems in cognitive-resource availability or allocation for such processing. Indeed, the efficiency of working memory processes—as reflected in a measure of reading span—has been shown to be related to age differences in representation in at least one case (Hess & Tate, 1992).

One complicating factor for this explanation, however, is that the just-described age difference in the inconsistency effect is not always observed (Hess & Pullen, 1994; Hess, Vandermaas, Donley, & Snyder, 1987). Based on such results, Hess (1994; Hess & Pullen, 1994) hypothesized that the specific characteristics of the task may also be important determinants of age effects in performance by influencing the probability that an individual will engage available cognitive resources and process information in a specific fashion. For example, older adults may be less likely than younger adults to engage in elaborative processing operations when the meaningfulness of a task is low. The goal of the present research was to increase our understanding of the factors underlying the variability in age effects in representations.
EXPERIMENT I

In this study, we examined age differences in two different types of person representations as well as interrelationships between these representations. The first has to do with memory for behavioral information, with a specific interest in the potential role of goal-relevant factors in determining the nature of the Age × Consistency interaction in behavior recall. Previous work (Hess, 1995; Hess & Tate, 1991) has shown that older adults are less likely than younger adults to engage spontaneously in the types of elaborative processing (e.g., inconsistency explanation) necessary for boosting memory for unexpected information, but that they can do so and their memory benefits to the same degree as that of younger adults when they do. Of interest is an understanding of the conditions that determine when older adults do engage in the more extensive processing associated with superior memory for inconsistencies. It may be possible to explain previous findings through reference to cognitive demands associated with elaborative processing, whereby it is assumed that the initiation and efficiency of effortful memory processes associated with inconsistency resolution are negatively affected by declines in processing resources with age. It may also be, however, that age differences exist in the conditions under which individuals will engage in such processing. Fiske and Taylor (1991) note that memory for behavioral information is related to the goals of the perceiver, and that less superficial, more psychologically engaging goals (e.g., evaluating a potential co-worker’s skills) are associated with more extensive processing and better memory (e.g., Srull, Lichtenstein, & Rothbart, 1985). With age in adulthood, the meaningfulness of goals may take on added significance as people function within the context of declining physical and cognitive resources (see also Carstensen, 1991). For example, given a general increase in the relative difficulty of any task with aging due to presumed changes in cognitive capacity, there may be a decrease in motivation to engage in elaborative processing unless the task has some intrinsic interest. This would be consistent with the notion of the perceiver as a “cognitive miser” (Fiske & Taylor, 1991), with the conditions associated with maintaining cognitive economy changing somewhat with age. Thus, we offer the general hypothesis that aging is associated with more judicious application of resources, with cognitive engagement becoming increasingly affected by task meaningfulness with increasing age.

In the present study, we explore this hypothesis through a task manipulation in which participants were presented with behavioral information under two sets of instructions. The first consisted of standard impression-formation instructions, whereas the second asked participants to judge the extent to which the target person would fit a particular role in their lives. We hypothesized that these two types of instructions would result in differential task engagement and, consequently, processing of inconsistencies. For example, although the behavior “made a sexist remark” might be seen as informative when creating a general impression, its significance may be even greater when presented in the context of evaluating someone’s fitness to be a judge hearing your case in court. In this latter case, the behavior is not only evaluatively inconsistent with the other behaviors, but it has specific relevance to a presumed processing goal (e.g., assessing whether the individual is impartial and open-minded). Consistent with current models of impression formation (e.g., Fiske & Neuberg, 1990; Hilton & Darley, 1991), we hypothesized that, in general, participants would be more likely to allocate additional processing to such information in this situation as they evaluated each target’s behaviors with respect to personally meaningful goals. This, in turn, should result in superior overall memory and a greater impact of inconsistency on recall than observed with standard impression-formation instructions. That is, due to the added meaningfulness of inconsistent information relative to the specified role, such information should be examined even more carefully than when such information is simply evaluatively inconsistent, which should result in an even greater advantage in memory over consistent information. In addition, if task meaningfulness underlies previously observed age differences in inconsistency effects in recall, this manipulation should have a greater impact on the performance of older adults than on that of younger adults.

The second aspect of representation examined was associated with impressions constructed by participants, as measured by their trait ratings associated with each target. These ratings reflect two different pieces of information, one having to do with general evaluative information (e.g., the target’s behaviors suggest that he is a likeable person) and one having to do with specific trait inferences (e.g., the target’s behaviors suggest that he is an honest person). Based on existing research and theory in social cognition, we hypothesized that the use of each of these types of information in constructing impressions puts different demands on cognitive resources and that age differences in ratings would reflect these demands. Specifically, recent reviews of the literature (Bargh, 1994; Uleman, Newman, & Moskowitz, 1996; Wyer & Carlton, 1994) have indicated that both types of information are inferred spontaneously with little effort by younger adults, although the degree of spontaneous trait inference may be affected by the goals of the perceiver (Uleman et al., 1996). This suggests that the resource demands associated with encoding each type of information are low, leading to an initial hypothesis that age differences in the representation of such information will be negligible (i.e., age-related reductions in working-memory efficiency will not affect performance).

Evidence from existing aging research, however, is mixed on this point. Whereas some studies have shown that evaluative information is readily encoded and used by older adults (e.g., Hess, Pullen, & McGee, 1996), other research has suggested that older adults are less likely than younger adults to utilize specific trait information in making judgments (Hess & Follett, 1994). This may reflect the fact that whereas trait encoding from behaviors may be relatively spontaneous, the use of this information in organizing a person’s impression of the target is not (Wyer & Carlton, 1994). For example, some research has demonstrated that the use of traits in organizing an impression is dependent upon the perceiver’s goals; trait-based organization is more likely with an impression-formation goal than with other
types of goals, such as memorization (e.g., Bassili & Smith, 1986). This suggests that the use of trait information in the creation of person representations may be under the conscious control of the perceiver. Consistent with views suggesting that aging is associated with decreased ability to effectively allocate resources and control processing (e.g., Craik & Byrd, 1982; Jennings & Jacoby, 1993), we might then expect that older adults would be less likely than younger adults to organize their representations around specific traits. This hypothesis was tested directly in the present study by having participants provide impression ratings for traits that did or did not have behavioral referents in the target description. We hypothesized that both young and older adults would process evaluative information in a similar manner, leading both to rate positive traits as more descriptive of the targets than negative traits. At the same time, however, we hypothesized that younger adults would be more likely than older adults to use specific trait information to organize their impressions, and therefore be more likely to make rating discriminations between traits with and without behavioral referents.

Finally, we also examined age differences in the methods by which people construct inferences about other people. We did this by examining the use of the aforementioned types of representations in making memory-based versus on-line judgments. According to theory (Hastie & Park, 1986), representations relating to specific processing goals are formed on-line during initial exposure to the target information. Subsequent judgments relating to these goals should tap into these specific representations and should be independent of other information in memory, such as that for specific behaviors. In contrast, judgments that are unrelated to these initial processing goals are thought to be constructed using specific behavioral information in memory. These are referred to as memory-based judgments.

In this study, all participants made a job-fitness assessment after behavior recall, regardless of initial study instructions. Consistent with the just-described conceptualization, we hypothesized that these assessments would be independent of behavior memory with job-evaluation instructions, but would be correlated with behavior recall under impression-formation instructions because participants had not addressed the job-fitness issue previously in relation to these targets. We were especially interested in seeing if these types of relationships were consistent across age groups. Construction of memory-based judgments might be more difficult for older adults than for younger adults due to the demands placed on working-memory resources as individuals retrieve and integrate information. If so, we would expect to see less systematic relationships between memory and judgments with increasing age.

Method

Participants

48 people (24 men and 24 women) in each of two age groups participated in this study. The younger adults (Mage = 20.5 years; range = 17–29) were undergraduate students at North Carolina State University with a mean of 13.7 years (SD = 1.2) of education who satisfied a course option through their participation. The older adults (Mage = 66.6 years; range = 60–75) had a mean of 15.3 years (SD = 2.7) of education and were recruited through advertisements in a Raleigh, North Carolina, newspaper. These individuals were paid for their participation. Using a 5-point scale (1 = excellent, 5 = poor), the older adults rated themselves to be less healthy than the younger adults (1.9 vs 1.6), F(1,92) = 5.32, p = .023, MSE = .5, although participants in both age groups considered themselves on average to be in good health.

Materials

Behavioral description.—Four sets of behavioral descriptions were created, each of which consisted of 9 behaviors performed by one man. The behaviors in each set varied in terms of their evaluative content as well as their consistency with respect to a specific occupation; a different occupation was used for each set. Six behaviors in each set were positive and were rated as being consistent with the occupation and 3 were rated as negative and inconsistent. These stimulus behaviors were created by first having a group of 15 young adults rate 40 different personality traits (using a 7-point scale) as to their desirability with respect to 10 different occupations. (Note that we only used younger adults to obtain ratings because our previous research (e.g., Hess & Pullen, 1994; Hess et al., 1987) has shown consistently high agreement across age groups in such ratings.) We also had them rate their general impressions of each occupation (1 = very unfavorable, 7 = very favorable). We then selected the four occupations (judge, police officer, physician, and teacher) that had the most favorable impression ratings (M = 5.42) in order to ensure that we would be able to develop behaviors that varied both in terms of evaluative and occupational consistency. A list of 30 behaviors was created for each occupation and represented personality traits that were rated as being either highly desirable or undesirable with respect to the occupation. An independent group of 26 participants then provided two ratings for each behavior, one that indicated an overall evaluation of the behavior (1 = negative, 7 = positive) and one that indicated whether the trait underlying the behavior was consistent with the specified occupation (1 = inconsistent, 7 = consistent). Based on these ratings, 9 behaviors were selected for each occupation. The 6 consistent behaviors were chosen because they had both high evaluative (M = 6.09) and consistency (M = 6.19) ratings, whereas the 3 inconsistent behaviors were chosen because of their low evaluative (M = 2.19) and consistency (M = 2.14) ratings. Behaviors taken from the set associated with the occupation of judge included “remained calm during the argument” (consistent) and “made a sexist remark” (inconsistent).

Note that this correlation between evaluation and consistency, along with the use of behaviors with nonneutral ratings on these two scales, resulted in behavior sets that were equally informative regardless of the goals of the perceiver. Thus, when forming a general impression, the positive or negative valence associated with individual behaviors would assist in determining the target’s likability. Likewise, when assessing job fitness, the same behaviors provided in-
formation regarding the extent to which the target displayed behaviors that were either consistent or inconsistent with job-relevant traits. This helped to ensure that the goals associated with instructions to form an impression or evaluate a target’s job fitness would not result in differential attention to consistent and inconsistent behaviors.

The behaviors in each set were listed on one page with study instructions provided at the top. The first two behaviors in the list were randomly chosen consistent behaviors (in order to induce an initial positive evaluation), immediately followed by the remaining seven behaviors listed in random order. Two separate versions of each set were prepared. For the standard version, the instructions read, “Based on the behavioral information below, form an impression of what Philip is like.” For the evaluation condition, the instructions read, “Philip is a police officer. Based on the behavioral information below, form an impression of how he would be as a police officer in your neighborhood.” (Note that a different name and occupation were used for each set.)

For each behavior set, an impression-rating scale was developed, consisting of 10 traits that were listed on a separate page. The traits were selected on the basis of their valences and consistency with the occupation; 5 were positive/consistent traits and 5 were negative/inconsistent traits. In addition, across all four targets, half of the traits (2 or 3 within evaluation/consistency levels for each behavior set) had behavioral referents in the target descriptions whereas half did not. A rating scale (1 = not at all descriptive, 7 = very descriptive) was listed at the top of each page. A recall-test page was also created for each set, consisting of a list of nine blank lines. An evaluation scale (1 = very bad, 7 = very good) was also listed on this page, upon which participants were to indicate their rating of the target person’s fit with a specified job.

Procedure
Participants were tested individually. After they completed a background questionnaire, participants were informed that we were interested in examining how people think of other people. They were told they would read behavioral descriptions of four different people. They were also informed that they would be asked to form a general impression of what the person was like in two of the cases and that they would be asked to evaluate the individual’s fitness for a particular job in the other two cases. An example of how the task would proceed was provided and the experimenter ensured that each participant understood the procedure before proceeding. The participant was then presented with a test booklet that contained four behavioral descriptions, each followed by the appropriate trait-rating list. The last four pages in the booklet consisted of the four recall pages arranged in the same order in which the behavioral descriptions were presented. Two of the descriptions in each booklet contained standard impression-formation instructions whereas the other two contained job-evaluation instructions; one description from each instructional condition was presented before either condition was repeated. Eight different presentation orders were used so that each behavioral description appeared in each presentation position with each of the two instruction sets equally often within age groups.

For the first person description, participants read the instructions at the top of the first page, read through the behavior list one time at their own paces, and then turned their test booklets over. Half of the participants in each age group then performed a nonverbal distractor task for 2 min (distraction condition), after which they turned to the trait-rating scale and rated how descriptive each of the traits was for the target person. This exact procedure was then repeated for the remaining three descriptions. The other half of the participants followed the same procedure, but instead of being given the distractor task, they were instructed to talk about the target person for 2 min before providing their ratings (think-aloud condition). This manipulation was included for exploratory purposes, with no specific age-related hypotheses. Previous research (Wyer & Martin, 1986) has suggested that such postinformation processing results in bolstering as participants attempt to examine the validity of their impressions. One result is that participants presumably reexamine information that is consistent with their impressions, thereby reinforcing the impressions and strengthening the representation of such information in memory. After all four behavior sets had been presented, participants turned to the first recall page, rated the fit between the person and the appropriate job, and then recalled as many of the behaviors as they could remember about the person. Note that job evaluations were made even for those targets that were encountered in the standard instruction condition; the job used in making the ratings was the one that was associated with the target when the behavior sets were initially constructed. This procedure was then repeated for the three remaining targets.

Following completion of this task, participants were debriefed and given a reading-span test to obtain a measure of working memory efficiency (for details, see Hess & Pullen, 1994) followed by the Wechsler Adult Intelligence Scale–Revised vocabulary subtest (WAIS–R; Wechsler, 1981). To ensure that participants in the two filler-task conditions did not differ in terms of these ability measures, 2 X 2 (Age Group X Filler Task) analyses of variance (ANOVA) were performed on the scores from each of these tests. As often observed in studies of aging, the older adults had significantly higher raw scores (M = 61.9, SD = 7.3) on the vocabulary test than did the young adults (M = 54.8, SD = 6.6), F(1,92) = 23.49, p < .001, whereas the younger adults had significantly higher reading-span scores (M = 3.5; SD = .9) than did the older adults (M = 3.1; SD = .7), F(1,92) = 4.18, p = .04, MSE = .68. In both cases, however, there were no significant effects involving filler task.

Results and Discussion
Unless otherwise noted, an α level of .05 was employed in assessing statistical significance throughout this report.

Trait Ratings
Mean ratings for positive and negative traits with and without behavioral referents were calculated across behavioral descriptions and initially examined using a 2 X 2 X (2 X 2 X 2) (Age Group X Filler Task X Instructions X Trait
Type × Trait Valence) ANOVA. Because Filler Task did not have any systematic effects on performance and inclusion of this variable was exploratory, the ANOVA was rerun excluding it from consideration. As the behavioral description consisted primarily of positive behavioral statements, we expected positive traits to receive higher ratings than negative traits, which they did, F(1,94) = 259.44. In addition, in that the processing of such information is assumed to be age-invariant due to the minimal demands placed on working memory, we did not expect age and valence to interact, a result that was also obtained, F < 1. Consistent with the notion that participants would encode and use traits to organize their person impressions, we also expected that traits, regardless of valence, would be given higher ratings if they had behavioral referents than if they did not. This effect was obtained, F(1,94) = 181.26, MSE = 2.12. Finally, we also predicted that the younger adults would be more likely than older adults to distinguish between traits with and without behavioral referents. This was supported by a significant Age × Trait Type interaction, F(1,94) = 7.83, MSE = .65 (Table 1). Ratings for traits with referents did not vary with age (M_young = 4.58; M_old = 4.66), F < 1, but the older adults had significantly higher ratings for traits without behavioral referents (M_young = 1.07) than the younger adults (M_old = 3.63), F(1,94) = 10.62. This finding is consistent with the hypothesis that aging is associated with limitations in the use of specific trait information in organizing impressions.

Behavior Recall

The proportion of behaviors recalled from each description was calculated and examined using a 2 × 2 × (2 × 2) (Age × Filler Task × Instructions × Behavior Type) ANOVA. Consistent with expectations, younger adults recalled more than older adults, F(1,92) = 42.84, MSE = .11, more behaviors were recalled in the think-aloud condition than in the distraction condition, F(1,92) = 4.94, MSE = .11, and inconsistent behaviors were recalled better than consistent ones, F(1,92) = 27.32, MSE = .02. Unexpectedly, the opportunity to further examine the behavioral information in the think-aloud condition did not bolster the recall for consistent behaviors.

Of most interest, however, were the effects of task instructions and age. We predicted that job-evaluation instructions would lead to greater task engagement than impression formation instructions, resulting in better memory, especially for inconsistent behaviors. Both effects were obtained: instructions, F(1,92) = 46.44, MSE = .03; Instruction X Behavior Type, F(1,92) = 8.13, MSE = .02. The predicted Age × Behavior Type interaction was also obtained, F(1,92) = 7.98, MSE = .02, as the effect of behavior type was stronger for the young adults, F(1,46) = 19.14, than for the older adults, F(1,46) = 3.84, p = .06. Contrary to our expectations, however, the Age × Behavior Type interaction was not modified by instructions. Planned comparisons did reveal, however, that the older adults recalled significantly more inconsistent than consistent behaviors in the job condition, F(1,46) = 5.85, indicating that job-evaluation instructions did have an impact on their memory for inconsistencies. The impact of instructions was similar to that for younger adults, however, and the form of the Age × Behavior Type interaction was maintained across instructional conditions (Table 2).

One concern with this analysis is that the instructional manipulation was conducted within participants, which creates the potential for biases in performance related to the sequence in which the conditions associated with this manipulation were presented. To examine this possibility, we conducted an additional analysis in which only performance on the first two targets was considered and presentation order (impression-formation or job-evaluation instructions first) was included as an additional variable. This allowed us to see if age differences in performance were modified when a specific condition was presented without exposure to the other condition (i.e., first target) or following exposure to the other condition (i.e., second target). Using a more liberal α level of .10 to allow for the reduction in power associated with addition of the order variable to the ANOVA, we found a similar pattern of performance to that of the initial analysis, with all statistical effects being replicated except for the Behavior Type × Instructions interaction (F < 1). This latter effect was modified somewhat by order, F(1,88) = 2.67, p = .11, MSE = .04, such that the strength of the inconsistency effect within each instructional condition was greater for the second tar-

| Table 1. Mean Trait Ratings as a Function of Filler Task and Behavioral Referent in Experiment 1 |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                  | Young Adults    | Old Adults      |                  |
| Behavioral       | Positive        | Negative        | Positive        | Negative        |
| Referent         | Traits          | Traits          | Traits          | Traits          |
| Present          | 5.35 (.67)      | 3.80 (.79)      | 5.54 (.55)      | 3.76 (.07)      |
|                  |                 |                 |                 |                 |
| Absent           | 4.49 (.85)      | 2.76 (.72)      | 4.88 (.80)      | 3.17 (.91)      |

Note: Standard deviations are in parentheses.

| Table 2. Proportion of Target Behaviors Recalled as a Function of Age, Span, and Instructions in Experiment 1 |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                  | Impression-Formation Instructions | Job-Evaluation Instructions |
| Group            | Consistent Behaviors | Inconsistent Behaviors | Consistent Behaviors | Inconsistent Behaviors |
| Young Adults     |                  |                    |                  |                    |
| High span        | .37 (.20)        | .46 (.22)          | .45 (.18)        | .59 (.26)         |
| Low span         | .30 (.18)        | .39 (.31)          | .40 (.16)        | .64 (.25)         |
| All              | .34 (.20)        | .43 (.25)          | .43 (.17)        | .62 (.26)         |
|                  |                  |                    |                  |                    |
| Older Adults     |                  |                    |                  |                    |
| High span        | .23 (.20)        | .21 (.24)          | .30 (.21)        | .43 (.27)         |
| Low span         | .13 (.14)        | .15 (.17)          | .22 (.19)        | .25 (.23)         |
| All              | .17 (.17)        | .17 (.17)          | .26 (.26)        | .33 (.26)         |

Note: Standard deviations are in parentheses.
get than for the first. The only effect involving age and order that approached significance was the Age × Instructions × Order interaction, \( F(1,88) = 2.97, p = .09, MSE = .04 \). This was because the advantage of job-evaluation over impression-formation instructions was smaller for the young adults when the job-formation condition was presented first than when it was presented second (differences = .07 vs .21, respectively). No order effects were obtained for the older adults.

In order to examine the impact of working memory differences on performance, subjects in each age group were divided into high and low reading-span groups based upon a median split for the entire sample, and the above ANOVA was rerun using span group as an additional factor. When this was done, additional effects due to span, \( F(1,88) = 4.14, \text{MSE} = .11 \), and the interaction between age, span, task, and behavior type, \( F(1,88) = 4.78, \text{MSE} = .02 \), were obtained. This latter effect is of most interest and, as can be seen in Table 2, is due to span mediating the impact of task instructions on the inconsistency effect in the older group only; separate analysis of the young adults’ data indicated no effects due to span. Specifically, the only condition in which older adults had a significantly higher level of recall for inconsistent versus consistent behaviors was in the high span group with job-evaluation instructions. Importantly, the Age × Behavior Type interaction in recall was eliminated in this condition, \( F < 1 \), but remained elsewhere. Thus, there is evidence of a differential impact of instructions across age groups, but only in high span subjects. This suggests that the present goal-related manipulation was only effective for those older adults who have the cognitive resources to expend.

One possible concern with using the present procedure to examine memory is that participants waited to provide recall until all four behavior sets had been presented. Given hypothesized age differences in the encoding of contextual information and the ability to identify the source of information (e.g., Hashtroudi, Johnson, & Chrosniak, 1989), we examined the proportion of target behaviors correctly recalled but assigned to the wrong target person. When incorrect recall was examined as a proportion of total items recalled, however, there were no age effects, indicating that young and older adults did not differ in incorrect behavior assignments and that the pattern of age effects in recall could not be due to such misassignments.

**Prediction of Job-Fitness Ratings**

In the last set of analyses, we examined the information used in the construction of job-evaluation ratings for each target by examining the relationship between these ratings and other information in memory that was assumed to be available to each participant. To do this, we used multiple regression equations to predict fitness ratings from the proportions of consistent and inconsistent behaviors recalled and an overall evaluative rating of the form: \( M \) rating for positive traits/(\( M \) rating for positive + \( M \) rating for negative traits). This last measure provided a proportional index of the extent to which the target was viewed in positive terms. Consistent with expectations regarding on-line versus memory-based judgments, we hypothesized that there would be no relationship between job fitness and recall with job-evaluation instructions, but that behavior memory would be predictive of fitness in the impression-formation condition. Expectations regarding relations between job fitness and evaluative ratings are less clear, but we hypothesized that a relationship would exist with both sets of instructions because the general evaluation should be used in constructing memory-based judgments and should also influence job-fitness judgments created on-line.

As shown in Table 3, the results were not as we had expected. For both age groups, there were no significant relationships between recall and job fitness with impression-formation instructions. The only significant predictor was overall evaluation, but the total amount of variance accounted for in each case was low. With job-evaluation instructions, recall was also not predictive of younger adults’ job-fitness ratings, a result consistent with expectations. Overall evaluation, however, was predictive and the model accounted for 30% of the variance. For the older adults, overall evaluation was also a significant predictor; however, recall of consistent behaviors was also positively related to job-fitness ratings, with the total model accounting for 33% of the rating variance. This finding of a significant recall-judgment relationship in the on-line condition is, naturally, inconsistent with our expectations.

The basic results of this study can be summarized as follows. First, analysis of impression ratings supported our hypothesis that both age groups would use evaluative information associated with traits in making these ratings, but that younger adults would be more likely than older adults to use trait-specific information. Second, our task instructions did have an impact on age differences in the processing of inconsistent information (as indicated by relative recall levels for impression-consistent and -inconsistent behaviors). This effect, however, was only found for older adults with high reading spans. Whereas these results support our general assertion that differences in motivation across age groups can influence how information is processed and what is remembered, they also suggest that a minimum level of cognitive resources may be necessary in older adults either to process inconsistencies efficiently or to mobilize the necessary processing resources. This finding is consistent with research in social cognition suggesting that motivation to engage in accuracy-driven processing is only effective if sufficient capacity is available (e.g.,

**Table 3. Prediction of Job-Fitness Ratings in Experiment 1**

<table>
<thead>
<tr>
<th>Instructions</th>
<th>Consistent-Behavior Recall</th>
<th>Inconsistent-Behavior Recall</th>
<th>Evaluation Ratings</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Young Adults</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impression-formation</td>
<td>-.12</td>
<td>-.07</td>
<td>.25*</td>
<td>.09</td>
</tr>
<tr>
<td>Job-evaluation</td>
<td>.05</td>
<td>.09</td>
<td>.54*</td>
<td>.30</td>
</tr>
<tr>
<td><strong>Older Adults</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Impression-formation</td>
<td>.13</td>
<td>.01</td>
<td>.33*</td>
<td>.13</td>
</tr>
<tr>
<td>Job-evaluation</td>
<td>.44*</td>
<td>-.13</td>
<td>.41*</td>
<td>.33</td>
</tr>
</tbody>
</table>

\*p < .05.
Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994). However, this does not explain why the young high-span adults did not receive a similar disproportionate “boost” in performance relative to low-span individuals. We will return to this issue later in this article. Finally, an examination of on-line and memory-based judgments resulted in findings that were mixed with respect to existing social-cognitive theory (e.g., Hastie & Park, 1986). One possible problem in this last analysis is that each participant viewed four different sets of targets before they were asked both to recall behaviors and provide job ratings. It is likely that these multiple representations may have interfered with individuals’ attempts to identify and retrieve specific types of information from memory, clouding the examination of the bases for judgments in this study and suggesting caution in drawing conclusions regarding age differences from these analyses.

EXPERIMENT 2

A second study was conducted to further examine some of the issues addressed in Experiment 1. One goal of this study was to provide a clearer examination of age differences in the construction of judgments about people. To do this, we used a procedure similar to that in the first study, but reduced the number of person descriptions that participants read from four to two. This limited potential confusion between target representations when attempting to make judgments. At the same time, a similar memory load was maintained by keeping the total number of behaviors to be recalled constant across experiments. If the problematic results relating to on-line versus memory-based judgments in Experiment 1 were due to confusions between information sources in memory, then reduction of the number of potential sources of confusion should facilitate our examination of these judgment processes.

The second goal of this study was to examine other factors that might influence age differences in memory for behavioral information. One factor had to do with the manner in which the behavioral information is presented to participants. An examination of procedures and results in both the present and previous research on person memory and aging has suggested that age differences in the inconsistency effect in recall are more likely to emerge when behaviors are presented together in a list (Experiment 1; Hess & Tate, 1991) than when they are presented individually (Hess & Pullen, 1994; Hess et al., 1987). The modification of the age effects in recall with individual item presentation may reflect changes in the nature of processing associated with task structure. For example, individual rather than grouped presentation might assist individuals in focusing their attention on individual behaviors, thereby reducing task demands and supporting more extensive processing of inconsistencies. To test this hypothesis, behaviors in this study were presented one at a time. If our general hypothesis that older adults are less likely than younger adults to elaborate on inconsistencies is correct, then the individual-item focus encouraged by presenting behaviors one at a time might have a particularly strong impact on older adults’ performances, resulting in a reduction or elimination of the Age × Behavior Type interaction observed in Experiment 1.

The final purpose of this study involved an attempt to tap into internal as well as external facets of motivation that might underlie age differences in impression-formation processes. Several studies (e.g., Moskowitz, 1993; Neuberg & Newsom, 1993) have noted a relationship between use of stereotyping and categorization in impression formation and the individual’s desire for simplification and structure in his or her interactions with the social world. In the present study, we were interested in seeing if age was positively related to need for structure in adulthood, which in turn might account for the more simplistic representations (e.g., reduced processing of inconsistencies, more extreme impression ratings) often observed in older adults (e.g., Hess et al., 1987). Several factors suggest that such a relationship might exist. For example, Kruglanski and Webster (1996) review research demonstrating that the desire for structure can be situationally determined; simple structures are desirable under conditions of time pressure or cognitive overload. Extrapolating from this experimental literature, one could reasonably hypothesize that increasing age in adulthood would be related to need for structure due to the presumed reduction in cognitive resources—and the individual’s attempts to allocate them efficiently—that accompanies aging. Alternatively, an increased desire for structure may come about as a result of changes in life circumstances, as individuals seek out the affective benefits of clearly understood situations (e.g., Carstensen, 1991). At present, we are unaware of any published reports examining the relationship between age and need for structure. However, one study has found a relationship between need for structure and performance in old age. Specifically, Okun and Rice (1997) observed that older adults who were high in need for structure were less likely than low need individuals to incorporate new information into memory that contradicted existing beliefs (regarding osteoarthritis), thereby encouraging simplicity by maintaining the existing structure.

In the present study, we examined the relationship between need for structure and impression formation. Specifically, we hypothesized that, in contrast to individuals who are low in need for structure, individuals with high need for structure would exhibit processing strategies consistent with creating simple representations (i.e., less extensive processing of inconsistencies) as well as representations that are more simplistic in nature (e.g., higher impression evaluations, poorer memory for inconsistencies). In addition, we also expected that they would be less sensitive to situational demands (e.g., our instructional manipulation) as they seek to create general impressions that are independent of situation-specific qualifying information (Kruglanski & Webster, 1996). Finally, we also investigated whether age differences exist in need for structure and, if they do, whether they could account for age differences in performance observed in previous research (e.g., older adults’ disproportionately poorer recall of inconsistencies).

Method

Participants

Participants were recruited as in Experiment 1. Sixteen men and 16 women from each of three different age groups
participated. The young adults had a mean age of 19.9 (range = 17–29) with a mean of 13.4 years (SD = 1.3) of formal education. The middle-aged adults ranged in age from 36 to 58 (M = 50.3) and had an average of 15.1 years (SD = 2.30) of education. Finally, the older adults ranged in age from 60 to 80 (M = 68.2) and had an average of 16.3 years (SD = 2.8) of education. There were no significant between-group differences in self-rated health, with the young and middle-aged adults having means of 1.6 (SDs = .7) and the older adults having a mean of 2.0 (SD = .9).

Materials

Two behavioral descriptions were created, each with 12 consistent and 6 inconsistent behaviors. The behaviors were chosen as before to vary in terms of both their evaluative consistency and their consistency with two different occupations, judge and law-enforcement officer. The same behaviors associated with these occupations in the first study were used here along with 9 additional ones for which norms had also been obtained in Experiment 1. A quasi-random ordering of the behaviors was used, with 2 consistent and 1 inconsistent behaviors appearing in each sextile of the list. Impression ratings were obtained using two 7-point scales on which participants rated how positively and negatively they felt about the target.

Procedure

Each participant was presented with the two behavior sets, one with standard impression-formation instructions and the other with the job-evaluation instructions. The order of presentation of the two types of instructions was varied systematically in conjunction with the specific behavior set used with each instruction across participants within age groups, resulting in four different presentation orders. The basic presentation and recall procedure was similar to that used in the think-aloud condition in Experiment 1, with two exceptions. First, the behaviors were presented one at a time on a computer monitor, with participants controlling the presentation rates and reading times being recorded. The appropriate instructions were read to the participants before they viewed the behaviors in each set. The second change was that all participants discussed their impressions of each target for 1.5 min and then provided both trait and evaluative ratings. We reduced this discussion time from 2 min because participants in Experiment 1 rarely talked longer than 1 min.

After participants had completed the impression formation part of the study, we once again assessed their reading spans and verbal skills. Raw scores on the WAIS-R Vocabulary subtest were found to vary across age groups, F(2,93) = 14.61, MSE = 37.0, because middle-aged adults (M = 62.1; SD = 6.1) and older adults (M = 64.3, SD = 4.4) had significantly higher scores than the young adults (M = 56.4, SD = 7.3). No age differences were observed for reading span, F(2,93) = 1.39, p = .25, MSE = 1.0; both the young and middle-aged adults had mean spans of 3.6 (SDs = 1.1) and the older adults had a mean span of 3.2 (SD = .8).

Participants also completed the 11-item Personal Need for Structure (PNS) scale (Neuberg & Newsom, 1993; Thompson, Naccarato, & Parker, 1989). (Due to an oversight in procedure, 5 younger adults did not complete the PNS scale.) Although there was a slight increase in scores with age on this scale, between-group comparisons resulted in no significant differences, F < 1, MSE = 81.8. The young adults' mean total score was 37.9 (SD = 7.5) compared to 40.0 (SD = 9.1) for the middle-aged adults and 40.4 (SD = 10.1) for the older adults.

Results and Discussion

For each dependent variable, the data were analyzed in two stages. In the first, we used ANOVAs to examine the impact of age, instructions, and valence or consistency using data from all participants. This was followed by a second ANOVA that included need for structure as an additional variable, and thus excluded those 5 participants without PNS scores. PNS is examined in these analyses as a categorical variable based on a median split on the entire sample, and only effects involving PNS are reported. As in the first experiment, the impact of order of presentation for the two instructional conditions was examined for each dependent variable. Inclusion of this variable did not, however, modify the obtained age effects in any case.

Reading Times

Reading times for individual behaviors were examined, and those that were less than 500 ms were eliminated from further consideration. The remaining times were divided by the total number of words in the behavior description to control for differences in description length. Those per-word reading times that were 3 SDs above or below each subject's mean were also eliminated from further consideration. The data for one younger and one older adult were lost due to a computer malfunction, and the data for three additional older adults were excluded from the analysis due to their extremity. Mean reading times were then calculated on the remaining data and examined using a 2 X (2 X 2) (Age Group X Instructions X Behavior Type) ANOVA (see Table 4). In line with past research (e.g., Hess & Pullen,
1994), consistent behaviors ($M = 563$ ms) were read more quickly than inconsistent ones ($M = 631$ ms), $F(1,88) = 54.70$, $MSE = 6918$. Reading times were also significantly faster with impression-formation instructions ($M = 590$ ms) than with job-evaluation instructions ($M = 595$ ms), $F(1,88) = 8.29$, $MSE = 360$, although this effect is qualified by a significant interaction between instructions and consistency, $F(1,88) = 6.13$, $MSE = 3180$. Specifically, the difference in reading times between inconsistent and consistent behaviors was greater for the job condition (81 ms) than for the impression condition (48 ms). This effect supports our hypothesis that participants would give relatively more weight to processing inconsistencies in the former condition. Our internal motivational factor also was related to processing of inconsistencies, as indicated by a significant PNS $\times$ Consistency interaction, $F(1,80) = 6.13$, $MSE = 6634$. Consistent with expectations, this effect was due to low-PNS participants allocating disproportionately more attention to inconsistent items than high-PNS participants did (see Figure 1).

**Impression Ratings**

In order to obtain a single impression rating that reflected overall evaluation, we calculated a proportional measure similar to that obtained in the previous study and then examined these scores using a $2 \times (2)$ ($\text{Age} \times \text{Instructions}$) ANOVA. A significant effect was obtained for instructions, $F(1,93) = 5.47$, $MSE = .02$, as job-evaluation instructions were associated with more favorable evaluations than impression-formation instructions were (.61 vs .56). This may indicate greater task engagement (as reflected in inconsistency resolution) toward the specified goal in the job condition. When PNS was included in the analysis, the anticipated main effect of PNS was not obtained. An interaction between PNS and instructions was present, however, $F(1,85) = 5.10$, $MSE = .02$, due to the fact that the previously described instructions effect was found in the low-PNS group only ($M_{\text{job}} = .62$, $M_{\text{impression}} = .54$), $F(1,42) = 7.32$. The high-PNS group had means of .59 for both conditions. These results can be interpreted as being consistent with hypotheses regarding the consideration of situational information in making social judgments. Specifically, Kruglanski and Webster (1996) have suggested that need for structure should be associated with more general categorizations of people, with little consideration of qualifying information regarding specific circumstances under which behavior might occur. In the present case, the failure of high-PNS participants to modify the nature of their responses across instructional conditions indicates their failure to take into account situational information in forming their impressions. The variation across instructional conditions for low-PNS participants, on the other hand, suggests a sensitivity to the situation, resulting in a modification in the way in which behavioral information was interpreted.

**Recall**

As expected, reducing the number of target descriptions resulted in a very small proportion of the recalled behaviors (.01 in each age group) being misattributed to targets and higher levels of recall in general. The proportions of behaviors correctly recalled in response to the appropriate target were then analyzed using a $2 \times 2 \times (2 \times 2)$ ($\text{Age Group} \times \text{Span Group} \times \text{Instructions} \times \text{Behavior Consistency}$) ANOVA. Span group was determined using a median split on reading-span scores for the entire sample and was included as a factor because of the effects obtained in Experiment 1. As can be seen in Table 4, recall decreased with increasing age, $F(2,90) = 11.00$, $MSE = .07$. In addition, high-span subjects recalled more than low-span subjects (.43 vs .34), $F(1,90) = 9.70$, $MSE = .07$. The expected behavior type effect was also statistically reliable, $F(1,90) = 50.04$, $MSE = .02$, with inconsistent behaviors being recalled better than consistent ones (.44 vs .33). Contrary to expectations, however, there was little impact of instructions, and this factor did not interact with age, span, or behavior type. The only interaction involving span that approached significance was the Span $\times$ Behavior Type interaction, $F(1,90) = 3.01$, $p = .086$, $MSE = .02$, with the inconsistency effect (inconsistent recall − consistent recall) being greater in subjects with high spans (.14) than in those with low spans (.08). The lack of instructional impact ($ps > .23$ for all effects involving this variable), as well as the absence of a 4-way interaction ($F < 1$), contrasts with the results of Experiment 1. This suggests that the individual presentation of behaviors in the present study resulted in a greater focus on each behavior, increasing the likelihood that participants in all conditions would process inconsistencies and integrate them within their memory representations. Finally, PNS was not related to performance in this analysis, nor did inclusion of this variable eliminate the age effect or result in any interactions with age.

**Prediction of Job-Fitness Ratings**

As before, we examined the relationship between recall, evaluation, and job fitness to investigate differences in the bases for such judgments and potential age differences therein. As can be seen in Table 5, the results for the young and middle-aged adults in Experiment 2 are consistent with expectations regarding on-line and memory-based judgments. Within each of these age groups, job-fitness assess-
ments in the impression-formation condition are significantly related to recall of one behavior type and the path coefficient involving the other behavior type is in the expected direction. In addition, evaluative ratings are also positively and significantly associated with job fitness. As expected, there are no significant effects involving behavior recall with job-evaluation instructions. In contrast, although the regression coefficients were in the expected direction for the older adults, the only one reaching statistical significance was that between evaluation and job fitness in the job condition. The predictor variables also accounted for substantially less variance in this group than in the other two age groups. Thus, it appears that the relationship between memory and judgment is not as strong in older adults as in those of younger years, presumably reflecting problems in the ability to effectively allocate cognitive resources to retrieve, integrate, or determine the source of information in memory.

**GENERAL DISCUSSION**

Much real-world functioning takes place within social contexts involving interactions with other people. The ability to function effectively in such contexts often depends upon the ability to represent accurately what people are like and to use this information in interacting with or making judgments about them. The present research was intended as an investigation of factors influencing adult age differences in social representation and judgment. One factor that we examined was the impact of hypothesized changes in basic processing mechanisms. Current models of cognition and aging strongly implicate changes in the efficiency of working memory functions as a prime determinant of age differences in representation and decision making (e.g., Salthouse, 1991), and the results of the present study suggest that such changes may also have an impact on social-cognitive processes. One way in which this can be seen is by examining the bases for the organization of information and judgments about the targets. In support of our hypotheses, examination of impression judgments revealed minimal age differences in the impact of evaluative information, which is thought to be processed spontaneously with little demand on limited-capacity resources (Bargh, 1994). For example, both young and older adults exhibited an evaluative bias in their impression ratings that is consistent with the informational content of the behavioral descriptions.

In contrast, age differences emerge in the use of specific trait information in organizing impressions, a process that has been hypothesized to be dependent upon controlled processing mechanisms (Wyer & Carlston, 1994). Specifically, younger adults were more likely than older adults to discriminate between traits with and without behavioral referents in making impression judgments in Experiment 1. One might reasonably argue that this age effect reflects between-group variations in trait encoding, and that older adults are more variable in their encoding of trait-related information. We believe, however, that evidence against such an argument can be found both in previous research (Hess & Follert, 1994), which has shown that young and older adults do not differ with respect to the processing of information about the frequency of occurrence of specific traits, and in the present results, which found older adults to discriminate between traits with and without behavioral referents, albeit less distinctly than younger adults. Instead, we suggest that older adults are simply less likely than younger adults to use this information in organizing information and making judgments about targets. This may reflect age-related difficulties in organizational processes or simply in the ability or willingness to retrieve specific trait information from memory, a process that may be more resource-consuming than that associated with access to evaluative information (see also Hess et al., 1996). This explanation is consistent with current data on younger adults, where it is assumed that it is the trait-based organizational function, rather than trait encoding, that is a controlled process (Wyer & Carlston, 1994). The present study data do not allow us to discriminate between these (and other) possible explanations. For example, the observed age differences in use of evaluative and trait-specific information in making trait ratings may not just reflect cognitive-process factors, but may also relate to differences in strategies. Future research could discriminate between potential explanations by examining other aspects of impression formation. For example, support for age differences in organizational processes might be inferred from age-related decreases in trait-based clustering in recall of behaviors. In conjunction with this, the alternative explanation that age differences are minimal in encoding should also be ruled out by obtaining measures of on-line processing (e.g., recognition probes concurrent with stimulus presentation) that reflect spontaneous trait inference (Uleman et al., 1996).

A second aspect of the data that implicates age differences in working-memory efficiency has to do with memory for specific behaviors. We hypothesized that age-related changes in the efficiency of controlled processing mechanisms would have a general impact on memory for behavioral information and a specific impact on memory for behavioral information that is either evaluatively inconsistent or at odds with the dominant impression being formed by the participant. Several aspects of the data supported this view. First, increasing age was associated with poorer memory in both experiments. We also observed a significant interaction between age and consistency for behavior
recall in Experiment 1, as the age effect was proportionately larger for inconsistent behaviors than for consistent behaviors. Given that inconsistency resolution is thought to put demands on cognitive resources (e.g., Srull & Wyer, 1989), this effect can be interpreted as evidence for processing efficiency as a mechanism in determining age differences in memory for behavioral information.

A third aspect of the data that implicates the importance of age differences in controlled processing mechanisms relates to the predictions of job ratings. When the determinants of job ratings were examined in a situation where participants had to construct judgments from information residing in memory (i.e., inferences about job fitness following general impression-formation instructions), the relationships between these judgments and memory were less systematic in later adulthood than at earlier points in the life span. For both the young and middle-aged adults in Experiment 2, recall of behavioral information was a significant predictor of job ratings with impression-formation instructions, whereas no such relationship existed for older adults. Consistent with current conceptualizations of aging and cognition (e.g., Jennings & Jacoby, 1993; Moscovitch & Winocur, 1992), our interpretation of this effect is that it represents age-related variability associated with capacity-demanding, controlled processing mechanisms, which are involved in searching and organizing information in working memory.

Whereas a principal focus in most research on aging and memory (or representation) has been on what might be termed purely cognitive factors relating to the structure and efficiency of the information processing system, we were interested in exploring the possibility that intrinsic motivational factors vary across age groups. This perspective is consistent with social-cognitive theory (e.g., Fiske & Neuberg, 1990; Hilton & Darley, 1991) in which between-individual variations in representations are related to such things as perceptions of importance (e.g., what is the relationship between the perceiver and the target?), which in turn influence the extent to which people are willing to engage in specific types of processing operations. We investigated potential age differences in motivation in several ways. First, we attempted to manipulate attention to behavioral inconsistencies by varying the importance of such information to the task performed by participants. Consistent with our expectations, job-evaluation instructions resulted in greater relative attention to inconsistencies at encoding (Experiment 2) and better memory for behaviors (Experiment 1), especially for inconsistencies, as compared to impression-formation instructions. It is important to note that we also obtained evidence that older adults are disproportionately affected by task instructions, although this effect was mediated by factors reflecting working-memory efficiency. Specifically, the Age × Behavior Type interaction observed under standard impression-formation instructions was eliminated under job-evaluation instructions for those individuals with reading spans in the upper half of the sample distribution. This suggests that older adults can effectively integrate inconsistencies into memory, but they may be more selective in allocating the cognitive resources to do so.

As noted before, this dependency of motivational effects on capacity is consistent with demonstrations elsewhere in the social cognition literature (e.g., Thompson et al., 1994). What is of additional interest here, however, is that the same relationship between capacity and motivation was not observed in the younger adults. This result may be reflective of age-related selective application of cognitive resources by the older adults. That is, if we assume that old age is associated with greater selectivity in general, it may also be true that this selectivity is exacerbated in those individuals with reduced cognitive resources. The fact that the performance of low-span older adults was unaffected by the instructional manipulation suggests that the current tasks may still fall below their threshold for cognitive engagement. This seems especially likely because the data for the low-span younger adults in Experiment 1 and that for the low-span older adults in Experiment 2 suggest that these individuals have the capability of engaging in the elaborative processing associated with the inconsistency effect in memory. The obtained effects associated with our instructional manipulation could be viewed as an extension of Carstensen's (1991) socioemotional selectivity theory to the cognitive process level, whereby the greater selectivity associated with age-related reductions in resources is manifested by the use of less demanding cognitive operations in situations of little significance to the individual. Future work might further investigate such effects by examining task circumstances with more immediate personal implications, for example, by manipulating the interdependence structures between the processor and target (Fiske & Neuberg, 1990).

The impact of instructions on memory was only evident, however, when participants were presented with behavioral information in a list format rather than the individual-fact format. Consistent with our expectations, the age differences in the inconsistency effect in recall observed in Experiment 1 were nonexistent in Experiment 2. This replicates the contrast in age effects observed across such presentation conditions in other studies (e.g., Hess et al., 1987, vs Hess & Tate, 1991), but in a more systematic fashion in two experiments that used basically the same materials and tasks with participants of similar ages and backgrounds. The fact that age and instructional effects were eliminated in Experiment 2 (i.e., all groups exhibited inconsistency effects in recall of similar magnitudes) suggests that the encoding of inconsistencies is facilitated by highlighting them through individual presentation, thereby specifically focusing the participant's attention. The specific facilitative effect that this presentation format appears to have on the performance of the older adults might be interpreted in terms of environmental support (Craik, 1986), whereby the older adult's processing is guided and made more efficient by reducing both attention allocation requirements and the amount of external information available to the individual at any one moment. Presenting information in this highly supportive framework, and thereby reducing demands on processing resources, may negate the impact of other performance-related factors associated with cognitive resource allocation (e.g., processing goals, working-memory capacity). Consistent with this hypothesis is the finding that older adults also appear to be more likely to exhibit in-
consistency effects in recall when they have impressions of the target prior to presentation of the behavioral information (e.g., Hess & Pullen, 1994). Presumably, reducing the requirements of the main task (impression formation) frees up more cognitive resources for processing specific behavioral information. More work needs to be done to evaluate the validity of this hypothesis, for example, by examining on-line processing requirements and inferential processes associated with different task conditions.

Our other investigation of motivation effects involved examining the impact of need for structure, and potential age differences therein, on performance. Consistent with other research, we did find that need for structure was associated with less extensive processing of inconsistencies and less consideration of situational constraints during impression formation. In addition, we also found that PNS did not interact with age in determining performance, suggesting that this measure may be useful for examining individual differences in need for structure across age groups. We did not, however, find any age differences in PNS, and cannot therefore provide support for our hypothesis that need for structure would increase with age in adulthood. However, given the potential relevance of the need for structure concept in adult development and the fact that this was a first attempt at exploring this relationship, we would like to see more systematic examinations of this relationship. Although PNS was not correlated with health or any of our ability measures, the selective nature of the present sample (i.e., no age differences in reading span or self-rated health, positive relations between age and education and verbal ability) may have mitigated against finding such a relationship. Future studies would do well to employ more representative samples in order to obtain greater insight into the relationship between age and this potentially meaningful motivational construct.

Two specific concerns might be raised regarding our interpretation of our results. The first relates to our hypothesis that the job-related instructions led to greater task (or cognitive) engagement than standard impression-formation instructions. It could be that presenting a specific occupation activates prototypic information that simply serves as a basis for evaluating and organizing information in memory. Although this explanation cannot be ruled out in our research, there are several pieces of evidence that suggest that differential task engagement was associated with the two types of instructions. First, reading times were greater for the job condition than for the impression condition in Experiment 2. Second, the mean length of descriptions produced in the think-aloud conditions in both experiments was greater for the job condition than for the impression condition (174 vs 156 words in Experiment 1, and 181 vs 174 words in Experiment 2). Third, the inconsistency effect for recall in Experiment 1 was greater for both age groups with job-evaluation instructions than with impression-formation instructions, reflecting the additional processing accorded to inconsistent information in the former condition. Further, evaluative expectancies were evident in the impressions of participants in both task conditions. This suggests that the variations in memory across instructional conditions in Experiment 1 cannot simply be attributed to the presence or absence of a concrete evaluation standard.

The second concern relates to our comparisons of results across Experiments. We argued that the elimination of age effects in performance in Experiment 2 resulted from the individual-item focus during presentation. In fact, the tasks used in the two studies differed in at least three other ways in addition to presentation format: (a) four versus two person descriptions; (b) 2 min versus 1.5 min think-aloud periods; and (c) half versus all subjects being asked to think aloud following presentation of the behavior sets. Once again, we cannot rule out the possibility that these factors played roles in determining the differences in results across experiments; however, there are several factors that appear to support our interpretation. First, even though different numbers of person descriptions were used, the total number of behaviors to be remembered was constant across studies. Second, the ratio of consistent to inconsistent behaviors (2:1) was maintained across all descriptions, resulting in similar positive expectancies across experiments. Previous research (e.g., Hasting, 1984) has shown that the size of the inconsistency effect in recall is more dependent upon this ratio than on the number of items in the behavior set. Third, the change in time allowed to think aloud did not appear to be important given that it was rare for participants in Experiment 1 to use the entire 2 minutes. In fact, if anything, one might expect that the extended processing time, coupled with the smaller number of items per description in Experiment 1, would have resulted in more dramatic inconsistency effects in memory. Finally, think-aloud instructions did not interact with any other factor in the first experiment, reducing the probability that having all participants engage in this task affected the outcome related to behavior consistency in Experiment 2.

In conclusion, the results presented in this article are consistent with recent conceptualizations of adult age differences in social-cognitive functioning, in which the importance of variations in both basic cognitive processes and motivational factors in determining representation and judgment processes has been highlighted (Hess, 1994). The present study also presents some initial data suggesting that the interdependence between these two sources of variation might be worth exploring. Specifically, whereas age-related variations in motivation might occur as a function of increasing social experience or transitions through specific social contexts, such variations might also occur in reaction to changes in cognitive systems. Exploration of such relationships would be useful in order to further our understanding of social cognition in adulthood and might also provide insights into the study of cognitive change and aging.

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Address correspondence to Thomas M. Hess, Department of Psychology, Box 7801, North Carolina State University, Raleigh, NC, 27695-7801. E-mail: hess@poe.coe.ncsu.edu

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