Aging and Selective Engagement: The Moderating Impact of Motivation on Older Adults’ Resource Utilization

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Two studies were conducted to examine age differences in the impact of motivation in a social cognitive task. We tested the hypothesis that aging is associated with an increase in the selective engagement of cognitive resources in support of performance. Different-aged adults read descriptions of 2 people in order to determine which was better suited for a particular job. These descriptions contained behaviors that were either consistent or inconsistent with the job, and participants performed the task under conditions of high versus low accountability. Examination of memory for behavioral information revealed that accountability disproportionately affected older adults’ performance, with the locus of this effect being in conscious recollection processes. This supports the aforementioned selective engagement hypothesis by demonstrating that the differential impact of the motivational manipulation was based in deliberative memory processes.

Key Words: Aging—Impression formation—Motivation—Person memory—Social cognition.
attributable to the more extensive processing accorded to the former type of behavior (Srull & Wyer, 1989)—which, in turn, is dependent on available resources (e.g., working memory)—these results suggested that older adults either had insufficient resources or were not engaging the cognitive resources necessary to support memory for this information. In subsequent research, Hess and colleagues (2001) attempted to encourage resource engagement in older adults by increasing personal accountability, which has been shown to boost cognitive effort and the complexity of thought (for review, see Lerner & Tetlock, 1999). Given that older adults have the capability to make sophisticated social judgments (e.g., Hess, Osowski, & Leclerc, 2005), it was thought that increasing their accountability in front of same-aged peers would pique their interest in the task. Consistent with the selective engagement hypothesis, Hess and colleagues observed a disproportionate positive impact of accountability on older adults’ memory for inconsistent information, eliminating the significant Age \( \times \) Consistency interaction in recall observed under low accountability conditions. One potential problem with interpretation of this result, however, is that the evidence for engagement was obtained at the outcome (i.e., memory performance) rather than the process level. Elsewhere (Germain & Hess, 2007), we have observed direct influences of motivation on specific processes (e.g., reading speed), but not in a memory task.

In the current research, we attempted to obtain support for selective engagement at the process level in a social cognitive task involving memory. To this end, we adapted a person memory task similar to that employed by Hess and colleagues (2001) so that we could examine performance using Jacoby’s (1991) process dissociation procedure (PDP). This procedure allows one to obtain estimates of the degree to which performance is based in conscious recollection processes (\( R \)) and in more automatic familiarity-based processes (\( F \)). We were specifically interested in \( R \), which reflects resource engagement. Most aging studies employing the PDP have found age effects in estimates of \( R \) (e.g., Hay & Jacoby, 1999; Jennings & Jacoby, 1997; Schmitter-Edgecombe, 1999). Such findings are consistent with theories hypothesizing that aging is associated with decrements in working memory, controlled processing, or executive functions (Braver & West, 2008). We were interested in whether these age differences in \( R \) would be attenuated by increasing accountability.

**Experiment 1**

In our first experiment, young, middle-aged, and older adults were presented with descriptions of two people and asked to select which person was better suited for a specified occupation. Each description contained behaviors consistent with traits associated with the occupation as well as some that were inconsistent. To obtain estimates of \( R \) using the PDP, we then tested an individual’s ability to discrimi-nate between (a) behaviors included in the two descriptions versus new ones (inclusion task) and (b) behaviors associated with the selected individual versus those associated with the unselected target or new behaviors (exclusion task).

Given the greater elaborative processing accorded inconsistent behaviors, we expected \( R \) estimates to be greater for such behaviors than for consistent ones. Under typical test (low accountability) conditions, we also expected that older adults would have lower \( R \) estimates than younger adults, particularly for inconsistencies. Consistent with the selective engagement hypothesis, and of primary interest, we also expected that making individuals accountable for their choice of targets would result in a disproportionate increase in \( R \) estimates for older adults, with the primary impact being on those for inconsistent information. We expected that these selectivity effects would be specific to old age but included middle-aged adults for exploratory purposes. Importantly, participants were unaware that their memory was to be tested, so it is assumed that variations in performance associated with accountability should reflect processing in service of the social judgment task rather than in service of remembering.

**Methods**

**Participants.**—Participants were recruited from the community through newspaper advertisements and paid $20 for their involvement. The young group consisted of 29 women and 18 men (range = 20–44 years), the middle-aged group consisted of 35 women and 17 men (range = 45–64), and the older group consisted of 21 women and 28 men (range = 65–82).

**Materials.**—Seventy-two behaviors were identified for each of two professions (physician, policeman), with independent groups of young, middle-aged, and older adults previously having rated 36 behaviors in each set as consistent with traits associated with the relevant profession and 36 behaviors as inconsistent. For example, “He refused to take money for work he had not done” and “He lied about his qualifications on a job application”—both relevant to the trait of honesty—were judged respectively to be consistent and inconsistent behaviors for a policeman. We used only behaviors for which there were no age differences in ratings. The mean rating (1 = inconsistent, 7 = consistent) for the occupation-consistent behaviors was 6.0 for the policeman and 5.9 for the physician, whereas the mean rating for the inconsistent behaviors was 2.1 for the policeman and 2.0 for the physician.

The 72 behaviors for each profession were divided into three sets of 12 consistent and 12 inconsistent behaviors. Each of these sets was used to construct a description of a target person, which consisted of the randomized listing of the behaviors in the set on a sheet of paper along with...
identifying information about the person listed at the top (e.g., “Peter is from Durham, NC”). Two of these descriptions were presented in the primary task, whereas the behaviors associated with the third description were used as new items in the memory tests. The two descriptions used were systematically varied across participants.

For the two memory tests, six consistent and six inconsistent behaviors from each of the three descriptions were randomly ordered to create one test form, and the remaining behaviors were used to construct a second test form. One of these test forms was used in the exclusion task and the other in the inclusion task, with forms being systematically rotated through tasks across participants.

Procedure.—Approximately half of the participants (n = 71) were assigned to the high accountability condition, whereas the remaining participants (n = 77) were assigned to the low accountability condition. Within each condition, approximately half of the participants were tested with the policeman stimuli, whereas the remaining participants were tested with the physician stimuli. (Content was found to be unrelated to performance.)

Figure 1 depicts the test procedure. All testing was done in groups of three or four similarly aged individuals. Participants read through each of the two target descriptions one time, with the goal of determining which person would be better suited for the relevant occupation (e.g., “physician” for the physician stimuli). Participants then selected the target that was better suited for the job and wrote a short paragraph justifying their decision. Participants in the low accountability groups handed their descriptions to the tester, with their selection and justification remaining anonymous. Each participant in the high accountability condition passed their written justification to a nonacquaintance in the group, who then silently read it and rated the strength of the justification. This took about 1 min. Participants were told about the public or anonymous aspect of their decision making prior to presentation of the stimulus materials and were reminded again just before making their decisions.

The unexpected memory tasks were presented next, with presentation order of the inclusion and exclusion tests counterbalanced. In the inclusion test, participants were instructed to mark “yes” beside each behavior on the test form that they remembered reading in one of the two target descriptions and “no” beside each behavior that they did not remember reading. On the exclusion test, participants were instructed to mark “yes” beside any behavior that was associated with their selected target and “no” beside any behavior that was either new or performed by the unselected target. They were also told that it was important to identify all behaviors associated with the selected target, and thus to mark “yes” beside behaviors they remember reading but were unsure of the target with which they were associated. Consistent with the logic behind the calculation of R and F estimates within the PDP (see subsequently), this last instruction facilitates identifying the extent to which participants were basing recognition responses on familiarity, with the rate of responding “yes” to unselected items reflecting reliance on familiarity when recollection failed.

Participants then completed the following ability tests: letter and pattern comparison (Salthouse & Coon, 1994); Wechsler Adult Intelligence Scale, third revision (WAIS III), Letter–Number Sequencing (Wechsler, 1997); and the Kit of Factor-Referenced Cognitive Tests (KFRCT) Vocabulary Test 2 (Ekstrom, French, Harman, & Derman, 1976). They also completed the Short Form 36-item (SF-36) Health Survey (Ware, 1993).

Results and Discussion

Participant characteristics.—Relevant background characteristics were examined using 3 × 2 (Age Group × Accountability) analyses of variance (ANOVA), revealing effects consistent with normative trends associated with aging (Table 1). No effects were observed involving accountability, indicating no inadvertent bias in assignment to conditions.

Person memory

Recognition memory.—The proportions of “yes” responses in the inclusion and exclusion tasks were examined using 3 × 2 × 3 × 2 (Age Group × Accountability × Behavior Source [selected vs. unselected vs. new] × Behavior Consistency)
ANOVAs. Because primary interest is in ability to discriminate between new behaviors and those associated with the two targets, only effects involving behavior source are discussed. In the inclusion task, responses to selected ($M = 0.84, SD = 0.14$) and unselected ($M = 0.80, SD = 0.17$) behaviors were higher than those for the new behaviors ($M = 0.14, SD = 0.14$), $F(2, 284) = 1206.69, p < .001$, $\eta^2_p = .90$. Significant effects due to consistency, $F(1, 142) = 7.89, p = .01$, $\eta^2_p = .05$, and its interaction with source were also observed, $F(2, 284) = 3.56, p = .03$, $\eta^2_p = .02$. This was due to response rates for inconsistent behaviors being higher than those for consistent behaviors for the selected target ($M [SD] = 0.86 [0.17]$ vs. $0.82 [0.19]$) and unselected target ($M [SD] = 0.83 [0.20]$ vs. $0.77 [0.21]$) but not for new behaviors ($M [SD] = 0.14 [0.17]$ vs. $0.14 [0.16]$). Thus, participants of all ages were able to make the relatively general distinction between behaviors that were presented and those that were not, with discrimination being somewhat better for inconsistent than for consistent behaviors.

In the exclusion task, significant effects were obtained due to source, $F(2, 284) = 338.64, p < .001$, $\eta^2_p = .71$, and its interaction with age, $F(2, 284) = 3.01, p = .02$, $\eta^2_p = .04$. As can be seen in Table 2, response rates in all groups were significantly greater ($p < .001$) to selected ($M = 0.68, SD = 0.17$) than to unselected ($M = 0.42, SD = 0.21$) behaviors, but all participants were also significantly more likely ($p < .001$) to incorrectly associate unselected behaviors than new behaviors ($M = 0.13, SD = 0.14$) with the selected target. This latter difference did not vary across age groups ($p = .86$). Young adults, however, exhibited significantly greater ($ps < .05$) discrimination between the selected and unselected targets ($M [SD] = 0.71 [0.18]$ vs. $0.36 [0.22]$) than did the middle-aged ($M [SD] = 0.66 [0.19]$ vs. $0.43 [0.20]$) and older ($M [SD] = 0.67 [0.20]$ vs. $0.48 [0.21]$) adults. Thus, when the memory discrimination task was made more difficult, younger adults performed better than older individuals. Accountability did not influence discrimination between targets, but its impact can be seen when the index of conscious recollection is examined subsequently.

**Process indices.** Consistent with our primary goals, we next used the PDP to obtain estimates of conscious recollection ($R$) to examine specific mechanisms underlying memory performance. The variable of interest in both the exclusion and inclusion tasks was the probability of making a positive recognition response to behaviors from the unselected target. In the exclusion task, this positive response is an error and will happen if an item is sufficiently familiar (i.e., recognized as having been in a description) but its source is not recollected; that is, $\text{Exclusion} = F(1 - R)$. In the inclusion task, a positive response is correct and can occur based on recollection or on familiarity when recollection fails; thus, $\text{Inclusion} = R + F(1 - R)$. Based on this logic regarding the factors associated with responses on the two memory tasks, $R$ estimates were obtained through algebraic substitutions: $R = \text{Inclusion} - \text{Exclusion}$. As expected, $R$ was significantly lower for consistent items ($M = 0.34, SD = 0.28$) than for inconsistent items ($M = 0.46, SD = 0.30$), $F(1, 142) = 20.43, p < .001$, $\eta^2_p = .13$, supporting the assertion that the mnemonic advantage for the latter reflects the increased resources devoted to resolving inconsistencies.
Of primary interest were the significant Age × Consistency, $F(1, 142) = 3.49, p = .03, \eta^2_p = .05$, and Age × Accountability × Consistency interactions, $F(1, 142) = 3.37, p = .04, \eta^2_p = .05$ (see Figure 2). $R$ estimates for inconsistent items were higher than those for consistent ones in both the young group ($M[SD] = 0.49[0.30]$ vs. $0.40[0.28]$, $F(1, 45) = 5.21, p = .03, \eta^2_p = .10$, and middle-aged group ($M[SD] = 0.52[0.31]$ vs. $0.30[0.31]$, $F(1, 50) = 18.90, p < .001, \eta^2_p = .27$, but not in the older group, $F(1, 47) = 1.24, p = .27, \eta^2_p = .03$. In contrast, the Accountability × Consistency interaction was not significant in either the young or the middle-aged group ($p < .09$), but was significant in the older group, $F(1, 46) = 6.84, p = .01, \eta^2_p = .13$. Consistent with predictions, the difference between $R$ estimates for consistent versus inconsistent items was significant in the high accountability ($p < .001$) but not in the low accountability ($p = .42$) condition. $R$ for inconsistent items was also marginally higher in the high versus low accountability condition ($p = .09$).

Although of less relevance to the present study, we also examined the impact of familiarity ($F$) on performance. Note that there was significant variation across age groups in baseline response rates to new items in the exclusion task ($M[SD] = 0.08[0.10], 0.12[0.12], \text{and } 0.18[0.16]$ for the young, middle-aged, and old, respectively), which violates assumptions for the PDP. Yonelinas, Regehr, and Jacoby (1995) note that such violations can be accommodated if (a) primary interest is in qualitative variation in $R$ and $F$ across conditions as opposed to obtaining true estimates and (b) there is no variation across tasks. Both are true in the present case, with the $M$ false alarm (FA) rates for exclusion and inclusion being $0.13\ (SD = .14)$ and $0.14\ (SD = .14)$, respectively. Thus, following the recommendations of Yonelinas and colleagues (1995), $R$ was calculated following the usual procedure (previously), whereas our new estimate of familiarity ($d'F$) was calculated as $d'$ using the original $F$ estimate (i.e., $F = \text{Exclusion/}[1 - R]$) as the hit rate along with the appropriate FA rate. When these estimates were examined, no significant effects emerged. This suggests that the primary influences of age and accountability were on conscious recollection processes.

In sum, under typical experimental task conditions, older adults exhibited lower levels of conscious recollection than did younger adults, especially for inconsistent information. Further, in line with expectations regarding increased selectivity in resource engagement in later life, increasing accountability had a disproportionate effect in the older adult group, with the primary impact on memory for inconsistent
behaviors. Note that support for the selective engagement hypothesis is dependent upon the observed accountability effects being reflections of motivation rather than something else. For example, it might be argued that group testing resulted in social facilitation effects, which bolstered performance (see Bond & Titus, 1983). Such an explanation seems unlikely given that both low and high accountability participants were tested within groups. It would be useful, however, to determine if the observed accountability effects were dependent upon the group-testing format.

Although the process-level findings were consistent with expectations, the exclusion and inclusion tasks were more similar to those used in early versions of the PDP (e.g., Jennings & Jacoby, 1993), with instructions regarding the use of conscious recollection and familiarity in making responses on both tasks not as clearly specified as in later versions (L. L. Jacoby, personal communication, March 23, 2006). Because performance on each task is thought to reflect both of these processes (see aforementioned equations used to calculate $R$ and $F$), the construct validity of PDP-based memory indices is optimized when participants place similar degrees of emphasis on recollection and familiarity across the two tasks in making their memory responses (Jacoby, 1998). This lack of specificity in the current instructions may, in part, account for some of the variability observed in baseline response rates across conditions. This, in turn, may have affected the stability of the obtained $R$ estimates.

To ensure that the nature of the PDP instructions did not affect our assessment of resource engagement, and that group testing was not responsible for the obtained accountability effects, we conducted a second experiment.

**Experiment 2**

The goals and design of the second study remained the same, but several procedural modifications were instituted. First, consistent with the foregoing discussion, the inclusion and exclusion task instructions were changed to more clearly specify participants’ use of recollection and familiarity in making memory decisions. We also changed our social accountability manipulation in order to (a) minimize differences in how high and low accountability participants were treated and (b) eliminate potential alternative explanations for the previously observed accountability effects. Using a manipulation similar to Wang and Chen (2006), individuals were tested individually rather than in groups and were informed that they would have to explain their reasoning to the experimenter later in the study — although they were never asked to do so. This procedure controls for the unlikely possibility that the previously obtained effects were influenced by the group-testing context, which may have hindered performance through evaluation anxiety or bolstered performance through social facilitation. It also controls for the possibility that the observed accountability effects—which have been conceptually and empirically linked to cognitive effort (Lerner & Tetlock, 1999)—were based in participants creating written justifications. Although the justifications in Experiment 1 were short, we also wanted to ensure that the reading of another participant’s justification in the high accountability condition was not responsible for the obtained effects.

**Methods**

**Participants.**—Seventy-three older participants were recruited and compensated as in Experiment 1. Ten were eliminated based on failure to follow instructions or cognitive screening using the Short Blessed test (Katzman et al., 1983), leaving a final sample of 30 men and 33 women ($M$ age = 72.0, range = 58–89). We recruited 71 undergraduates to be in the young group, each fulfilling a course option through participation. Four of these participants were dropped for failing to follow instructions, leaving a final sample of 37 men and 31 women ($M$ age = 19.9, range = 17–42). The original participants in each age group were randomly assigned to either the low or the high accountability group.

**Materials and procedure.**—The procedure was similar to that in the first study with the following exceptions. First, participants were tested individually to eliminate alternative explanations based in a group test format. Using an accountability manipulation similar to that of Wang and Chen (2006), participants in the high accountability condition were told that they would have to justify their target selection to the experimenter later in the session. No such instructions were given to those in the low accountability condition. Participants in the former group did not actually explain their choice but were informed of the purpose of the accountability manipulation following the memory test. Second, behaviors during both study and test were presented individually on a computer monitor, with participants controlling presentation rate and entering responses using the keyboard. Third, memory test instructions were altered to be more consistent with recent instantiations of the PDP (Kelley & Jacoby, 2000). In the inclusion task, participants were instructed to try to recollect whether a test item was contained in one of the two descriptions that they read. They were to respond “yes” if they (a) remembered reading it or (b) if it seemed familiar but they could not specifically remember the behavior occurring in the descriptions. They were to respond “no” if they did not remember reading it and it was not familiar. In the exclusion task, participants were instructed to recollect whether each test behavior was contained in one of the two descriptions they read and, if so, which one. They were to respond “yes” if they remembered reading it in the description of the selected target. They were also informed of the importance of identifying all behaviors associated with the selected target and thus were
also instructed to respond “yes” if they could not specifically remember the behavior being contained in the description but it seemed familiar. They were instructed to respond “no” if they remembered the behavior being part of the non-selected target description or if they did not remember reading it and it did not seem familiar. Fourth, prior to the memory tasks, participants completed a set of impression ratings rather than writing a justification. Finally, the WAIS III Vocabulary and Digit–Symbol Substitution tasks (Wechsler, 1997) were used instead of the previously used vocabulary and comparison tasks.

**Results and Discussion**

*Participant characteristics.*—We once again conducted 2 × 2 (Age Group × Accountability) ANOVAs on relevant background data (Table 1) to examine possible biases in assignment to the experimental conditions. Two such effects were found, with significant Age × Accountability interactions obtained for education and Letter–Number Sequencing (ps < .05). In neither case, however, were significant correlations observed between these two variables and our primary dependent measures.

**Person memory**

*Recognition memory.*—The proportion of “yes” responses on the memory tasks were analyzed as before (see Table 3). For the inclusion task, response rates for selected (M = 0.86, SD = 0.14) and unselected behaviors (M = 0.83, SD = 0.20) were significantly higher than those for new behaviors (M = 0.12, SD = 0.13), F(2, 252) = 1271.42, p < .001, ηp² = .91. As before, this effect was moderated by consistency, F(2, 252) = 21.29, p < .001, ηp² = .15, with the difference between old and new behaviors being greater for inconsistent (M = 0.88 [0.15] vs. 0.08 [0.13]) than for consistent (M = 0.81 [0.18] vs. 0.15 [0.20]) behaviors. Unlike the first study, a significant Age × Source interaction was obtained, F(2, 252) = 11.09, p < .001, ηp² = .08, due to the difference in response rates for old and new behaviors being greater in the young group (M [SD] = 0.86 [0.15] vs. 0.08 [0.08]) than in the older group (M [SD] = 0.82 [0.15] vs. 0.16 [0.16]). Thus, once again, all participants were exhibiting clear differentiation between previously read and new behaviors, but the effect was somewhat greater in younger adults. (This trend was present in Experiment 1, but the interaction was not significant.) The general similarity of these results with those from Experiment 1 suggests that the change in test instructions did not have a strong impact on performance.

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<th>Age Group</th>
<th>Consistency</th>
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<th>New</th>
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*Process indices.* As can be seen in Figure 3, the general pattern of R estimates is similar to that observed in
Experiment 1. Recollection was once again greater in the young than in the old group ($M [SD] = 0.44 [0.26] \text{vs.} 0.33 [0.26]$), $F(1, 127) = 6.43$, $p = .01$, $\eta^2_p = .05$, and for inconsistent than for consistent behaviors ($M [SD] = 0.42 [0.32] \text{vs.} 0.35 [0.28]$), $F(1, 127) = 8.44$, $p = .01$, $\eta^2_p = .06$. The Age × Accountability interaction just missed significance, $F(1, 127) = 3.82$, $p = .053$, $\eta^2_p = .03$, but planned analyses within age groups provided results consistent with expectations. Specifically, the accountability effect was significant for older adults, $F(1, 61) = 4.57$, $p = .04$, $\eta^2_p = .07$, but not for young adults, $F < 1$. In the old group, $R$ estimates were greater in the high than in the low accountability condition ($M [SD] = 0.40 [0.27] \text{vs.} 0.26 [0.23]$). Although consistency did not moderate this effect as in Experiment 1, contrasts between accountability conditions revealed a significant effect for inconsistent ($p < .05$) but not consistent ($p > .08$) information. Thus, the general pattern of performance replicated that of Experiment 1 and was consistent with our hypotheses.

We next examined estimates of familiarity. Although the variation in FA rates was somewhat smaller than in Experiment 1, significant differences were still observed between some task conditions but not between the inclusion and exclusion tasks ($M [SD] = 0.12 [0.13] \text{vs.} 0.13 [0.15]$, respectively). Thus, the signal-detection correction used before was once again deemed appropriate for estimating the relative influence of familiarity on performance across conditions. An ANOVA performed on these estimates revealed that familiarity was higher for young than for old ($M [SD] = 2.08 [0.97] \text{vs.} 1.65 [0.81]$, $F(1, 127) = 7.59$, $p = .01$, $\eta^2_p = .06$, and for inconsistent than for consistent behaviors ($M [SD] = 2.09 [1.18] \text{vs.} 1.65 [1.09]$, $F(1, 127) = 13.67$, $p < .001$, $\eta^2_p = .10$. These results are somewhat different than those observed in the first study, perhaps reflecting greater reliability in the obtained estimates due to the modification of testing instructions. The fact that $d'$ was greater in conditions that can be linked with relatively higher levels of resources (i.e., younger adults, inconsistent behaviors) could perhaps be seen as consistent with findings that familiarity increases with depth of processing (e.g., Toth, 1996). Given this relationship, however, it is unclear why familiarity estimates were also not enhanced by increasing accountability, which presumably is associated with elaborative processing. It may be that changes in familiarity have something to do with the specific manner in which resources affect performance (e.g., response criterion in making memory decisions) rather than simple utilization of resources, which is the primary focus of the present research.

In sum, the results of this study replicate those of the first in demonstrating the differential impact of social accountability across age groups, as reflected in estimates of conscious recollection. The reliability of these findings is further bolstered by (a) the modification of the testing procedure to ensure that participants’ responses in the memory tasks were consistent with PDP assumptions and (b) replication outside of a group-testing format. There was some minor variability in the pattern of results across studies, with, for example, the accountability effect in older adults being specific to inconsistencies in Experiment 1 but more broad-based in Experiment 2. It is not unexpected, however, that accountability would have a general enhancement effect on memory for all behaviors because engagement might increase allocation of resources to consistent as well as inconsistent behavior. The overall accountability effect in the second study may be reflective of more reliable estimates of $R$ due to the change in instructions. Note that, even with the general positive impact of accountability in older adults, planned contrasts demonstrated that the effect was stronger for inconsistencies.

**Conclusions**

The primary goal of the present research was to provide a more fine-grained investigation of age differences in the impact of motivational influences on social cognitive performance at the process level. In particular, we were interested in obtaining further evidence for the hypothesis that aging is associated with increased selectivity in the engagement of cognitive resources (Hess, 2006). Such selectivity is thought to be demonstrated by (a) the personal meaningfulness of the task having a stronger motivational impact on older than on younger...
adults and (b) age differences being reduced in conditions that encourage high levels of engagement relative to those that encourage less engagement. If these age-related motivational effects are truly related to engagement of cognitive resources, then their impact should be evident only when behavioral outcomes (e.g., memory performance) are assessed but also when specific processes reflective of engagement are examined. The use of the PDP in the present case permitted the examination of resource engagement at the process level.

Consistent with expectations, our motivational manipulations were specific both to older adults and to estimates of recollection. In addition, the age-related benefits of accountability were most evident in supporting memory for unexpected information. The beneficial effects of accountability on performance are thought to be based in the additional cognitive effort expended by participants in situations where they have sufficient capability to perform well (Lerner & Tetlock, 1999). The use of a social judgment task and the specific benefits of accountability on unexpected information—memory for which is dependent upon elaborate processing—are consistent with a motivational explanation for the obtained age effects. The use of an unexpected memory task also suggests that the source of the motivational effect was at encoding, as participants processed the target information in order to make the social judgment.

The present study adds to a growing set of studies demonstrating age differences in selective engagement of cognitive resources in support of performance (Chen, 2004; Ebner, Freund, & Baltes, 2006; Freund, 2006; Germain & Hess, 2007; Hess et al., 2001, 2005) and further contributes by providing specific evidence regarding the locus of the effect at the process level. Through use of the PDP conceptual framework, the specific effects of our motivational manipulation were located in conscious recollection processes that can be thought to reflect resource engagement. Although it can be argued that estimates derived using the PDP are also somewhat indirect indices of underlying processes, their grounding in a specific procedure for disentangling different sources of influence can be seen as providing more direct evidence regarding the processes hypothesized to underlie the effects of interest in this research.

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