Aging and Social Expertise: The Impact of Trait-Diagnostic Information on Impressions of Others

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Two studies were conducted to examine the bases for age differences in the construction of social inferences. In each study, adults aged from 20 to 80+ years were presented with an impression formation task in which they first read brief behavioral descriptions of fictitious people and then made a trait inference and likability judgment about each person. Results were generally consistent with previous findings in showing that aging was associated with an increase in the weighting of trait-diagnostic information in making trait attributions. In addition, the pattern of age effects was only minimally affected by situational factors that have been known to influence the use of trait-diagnostic information. The findings are interpreted as demonstrating an aging-related increase in social expertise in which knowledge regarding the underlying bases for the behaviors of others has been translated in specific procedural knowledge.

There is increasing evidence that many aspects of social-cognitive functioning do not remain static through adulthood, with aging being associated with changes in the operations, knowledge, and goals associated with understanding both self and others (Hess & Blanchard-Fields, 1999). Of interest is the fact that these age-related variations in social cognition appear to reflect adaptive changes in functioning related to changes in social experience and life circumstances. An examination of the existing research on social representational processes suggests several mechanisms associated with the observed age differences. For example, age-related changes in socioemotional goals (Carstensen & Turk-Charles, 1994) and the complexity of reasoning about self and others (e.g., Labouvie-Vief, Chiodo, Goguen, & Diehl, 1995) influence the manner in which social information is interpreted and remembered.

A more fundamental mechanism underlying changes in social-cognitive functioning may be the development of what might be termed social expertise, or what Staudinger and Pasupathi (2000) have labeled life pragmatics, associated with the age-related accumulation of social experience. This development would be reflected in the acquisition and use of specific types of knowledge for organizing and interpreting events in the social world. Additionally, consistent with the notion of expertise, successful adaptation would be related to the extent to which this knowledge accurately reflects social and cultural norms and enables the individual to effectively function in the social environment.

Such knowledge may be of several types. For example, it may reflect idiosyncratic knowledge associated with an individual’s specific life circumstances. Context-specific experiences based on factors such as religion and social class may be reflected in schemas about social behavior that are then used to make judgments about the behaviors of others (e.g., Blanchard-Fields, 1999). Social knowledge structures may also be group specific, reflecting experiences associated with age-graded social structures (e.g., Hess, 1992).

Of primary interest in the present context, however, is the possibility that adaptive changes in knowledge may reflect an increase in the sophistication of reasoning about people and their behavior in social contexts. For example, there is evidence that increasing age is associated with more complex, and presumably more accurate, representations of old age (e.g., Brewer & Lui, 1984; Hummert, Garstka, Shaner, & Strahm, 1994). There is also research demonstrating that middle-aged and older adults are more likely than younger adults to consider multiple factors in making causal attributions about another’s behavior (Blanchard-Fields, 1994; Blanchard-Fields & Norris, 1994). Such findings are suggestive of increasing expertise regarding the characterization of people and the factors underlying their behavior.

The present research focuses on a potential example of this latter type of aging-related social expertise identified by Hess and his colleagues (Hess, Bolstad, Woodburn, & Auman, 1999; Hess & Pullen, 1994) in their research on the use of trait-diagnostic information in impression formation. These studies have shown that increasing age is associated with greater adeptness at making trait inferences from an individual’s behavior, with middle-aged and older adults being more likely than younger adults to consider the diagnostic value, or diagnosticity, of a behavior in forming impressions. Diagnosticity refers to the probability with which a specific attribute is associated exclusively with a specific category and thus can be used reliably to assign exemplars to that category (Rosch, 1978). In the social realm, one of the most interesting examples of diagnosticity relates to the differential diagnostic value attributed to positive versus negative behaviors in the com-
tence and morality domains (Skowronski & Carlston, 1989). Specifically, positive behaviors are considered to be more diagnostic of competence than are negative behaviors, whereas the opposite is true for morality. For example, one can be relatively confident that a student who makes an A in a calculus course is high in mathematical ability or that a person who steals money is dishonest. In contrast, one is less confident in judging competence on the basis of a poor grade in a course or in judging morality on the basis of an honest act. Basically, trait-diagnostic behaviors are considered to be diagnostic because they are unlikely to be performed by someone not possessing the attribute (e.g., people with poor mathematical skills rarely do well in advanced math courses) and thus allow accurate categorization of an individual along the relevant trait dimension. In contrast, nondiagnostic behaviors could be observed in individuals at both ends of a specified trait dimension (e.g., failing a math test could be due to low ability, but it could also reflect lack of sleep or preparation) and thus are less informative in making accurate categorizations.

As noted before, increasing age has been shown to be associated with greater emphasis on the diagnostic value of behaviors in making trait inferences. For example, Hess et al. (1999) had different-aged adults read positively or negatively valenced descriptions of target persons, with half of the descriptions relating to honesty and the other half to intelligence. Thus, some people read information with high trait diagnosticity (negative—honesty or positive—intelligence) and some with low diagnosticity (positive—honesty or negative—intelligence). Of interest was how impressions based on these descriptions were altered with the presentation of additional behavioral information that was opposite in valence to that contained in the description. Hess et al. found that the impression ratings of young adults changed in a similar fashion regardless of the diagnosticity of the original content, with the primary basis for their judgments being the valence of the behavioral information. In contrast, middle-aged and older adults tended to maintain their initial impressions of the targets unless previously unavailable diagnostic information was provided. Thus, for example, their impressions changed more when information depicting dishonest behaviors was presented following an initial honest description of the target than when an initial dishonest description was supplemented with honest acts.

One possible source of these effects could be age differences in knowledge regarding the trait diagnosticity of specific types of behaviors. Although such an explanation is consistent with an expertise-related view of social—cognitive functioning, existing evidence suggests that young adults can make accurate judgments regarding the diagnostic value of individual behaviors in isolation (Skowronski & Carlston, 1987). In addition, Hess et al. (1999) found that different-aged adults did not vary in their ability to judge the trait diagnosticity of individual behaviors. This suggests that adult age differences—and by association, cohort differences—are minimal in the availability and nature of knowledge relating to trait diagnosticity.

An alternative explanation is that these effects reflect age differences in the accessibility or perceived applicability of diagnostic information. This interpretation would also be consistent with a social expertise view in which expertise goes beyond the availability of knowledge (i.e., declarative knowledge) to include the development of appropriate application skills (i.e., procedural knowledge; see J. R. Anderson, 1983). Such an explanation appears more reasonable given findings that younger adults are more likely to use diagnostic information in forming impressions when behaviors are extreme examples of traits (Skowronski & Carlston, 1992). Extreme examples may be more likely than less extreme examples to activate linkages with diagnosticity structures in individuals with underdeveloped procedural knowledge.

The present report consists of two studies intended to provide more systematic information regarding factors associated with the just-described age differences in the use of diagnostic information in constructing impressions. To preview, Study 1 examined the extent to which the interpersonal consequences of a target’s behaviors affected trait-diagnostic inferences, whereas Study 2 examined the consequences of the age-group membership of the target. Study 2 also extended previous research by examining age-related variations in attentional allocation to diagnostic and nondiagnostic behaviors.

**Study 1**

This study had two primary goals. First, we expanded on the research by Hess et al. (1999) by seeing if we could replicate their results with a simpler design. In that research, the complexity of the procedure associated with assessing the impact of trait-diagnostic information on judgments necessitated the use of a partial between-participants design. Although not invalidating the results, such a design may complicate the interpretation of the obtained data. The present study used a more straightforward within-participant assessment procedure that relied on single judgments made for each of the multiple target persons. Specifically, participants read brief descriptions of target persons consisting of two positive and two negative behaviors, with half of the descriptions composed of morality-related behaviors and the other half composed of competence-related behaviors. They then rated where the target fell on the appropriate trait dimension (e.g., dishonest—honest). If participants make trait inferences primarily on the basis of behavior valence rather than trait diagnosticity, relatively neutral attributions should be made with little distinction across trait domains. In contrast, if trait-diagnostic information is being considered, trait inferences should reflect the differential weighting of positive and negative information across domains. Specifically, inferences should be negative in the morality domain and positive in the competence domain. Consistent with past findings and the hypothesized aging-related increase in social expertise, it was expected that the use of trait-diagnostic information would increase with age in adulthood.

The second goal of this study was to examine age-related factors other than social expertise that might also influence the extent to which positive versus negative behaviors are weighted in making judgments of others. One such factor may have to do with the interpersonal consequences of behaviors performed by others. Affective outcomes associated with social interactions have been hypothesized to increase in salience with age in adulthood (Charles & Carstensen, 1999). This, in turn, might influence the extent to which the interpersonal consequences of a target’s behaviors are considered in making trait inferences.

Of relevance to this issue is theorizing by Peeters (1983), who has proposed that observed asymmetries in evaluations across contexts are related to the self-versus other-profitability of behaviors. When another person’s behaviors have primary implications
for self, evaluations are positively biased. In contrast, when be-
behaviors have implications for others, negative outcomes receive
disproportionate weight. Building on these ideas, Wojciszke
(1997) found that the construal of any behavior as reflecting
morality versus competence is in part related to whether it impacts
others or self. Behaviors with interpersonal consequences tend to
be construed in terms of morality, whereas those with intrapersonal
consequences tend to be construed in terms of competence. This
differential construal according to behavioral focus in turn affects
the extent to which positive or negative behaviors are considered
informative, or diagnostic, regarding underlying characteristics of
the individual. Wojciszke noted that most morality behaviors (e.g.,
stealing money) have an interpersonal focus, whereas those in the
competence domain (e.g., doing well on a math test) often have
primary consequences for the individual. This natural confounding
of domain and behavioral impact may in part account for the
differential diagnosticity of positive and negative behaviors across
domains.

In the present study, we were interested not only in how behav-
ioral focus would influence the use of trait-diagnostic information
in forming impressions but also whether hypothesized age-related
changes in socioemotional goals would increase the importance of
focus in making trait attributions. To do so, target descriptions
were constructed so that they contained behaviors that had their
primary impact on self (e.g., “Chad cheated at playing solitaire”)
or on others (e.g., “Jerry won the game of Monopoly because he
cheated”). Consistent with research by Wojciszke (1997), we
anticipated that trait ratings would be lower for targets whose
behaviors had implications for others rather than self. In essence,
a focus on others biases participants to reconstruct behaviors in
morality-related terms, resulting in increased weighting of nega-
tive information in constructing trait inferences. In addition, if
aging is associated with an increase in the salience of the inter-
personal consequences of behavior, then the weighting of negative
behavioral information in such inferences may increase with age.
We explored the possibility that this factor, along with the con-
founding between domain and behavioral consequences, may have
accounted for the somewhat larger age effects in the weighting of
diagnostic (i.e., negative) information in the morality domain
versus the competence domain in our previous research (Hess et
al., 1999).

Method

Participants. Individuals ranging in age from 20 to 84 years were
recruited from the community through newspaper ads to participate in the
study. Participants (N = 146) were distributed relatively evenly across the
age range tested, with 23 (9 men) aged 20 to 29, 24 (9 men) aged 30 to 39,
26 (11 men) aged 40 to 49, 24 (12 men) aged 50 to 59, 27 (14 men) aged
60 to 69, and 22 (10 men) aged 70 to 84. Age was unrelated to either
education, r(144) = .01, or self-rated health, r(144) = -.05, although
significant positive correlations were obtained between age and both num-
ber of prescription drugs being taken, r(144) = .25, p = .003, and number
of self-reported medical problems, r(144) = .22, p = .007. All participants
received $10 per hour for their participation.

Materials. Sixteen different target descriptions were created, each con-
sisting of two positive and two negative behaviors. Eight of these descrip-
tions contained behaviors relating to the domain of honesty and eight
relating to the domain of intelligence. Additionally, within each domain,
four descriptions contained only behaviors that had intrapersonal implica-
tions (i.e., primary impact on target), and four descriptions contained
behaviors with interpersonal implications (i.e., primary impact on others).
The targets within each Trait Domain X Behavioral Focus condition were
evenly divided between men and women.

The behaviors used in these sets were selected from a group of 99
behaviors (50 honesty related and 49 intelligence related) initially pre-
seated to an independent sample of 44 young adults, 28 middle-aged
adults, and 30 older adults. These individuals rated both the valence of each
behavior and how representative it was of its particular domain (honesty or
intelligence). These ratings were done on a 7-point Likert scale, with 1 =
very negative, dishonest, or unintelligent and 7 = very positive, honest, or
intelligent.

The ratings obtained were standardized for each participant on each
scale, and the mean trait-representativeness score and mean valence were
calculated for each behavior. These scores were then used in constructing
the target descriptions, with four behaviors in each, two being more
negative (both for representativeness and evaluation) and two being more
positive (both for representativeness and evaluation). The four descriptions
within each Domain X Focus condition (i.e., honesty-intrapersonal,
honesty-interpersonal, intelligence-intrapersonal, and intelligence-
interpersonal) were constructed such that there were no statistically reliable
differences in mean representativeness and evaluation scores for both
positive and negative behaviors across these four conditions. The range of
mean representativeness and evaluation ratings for positive behaviors
across each Domain X Focus condition were .75 to .93 and .82 to 1.00,
respectively, compared with -.74 to -1.05 and -.66 to -1.04, respec-
tively, for the negative behaviors. We also included only behaviors that had
statistically equivalent trait and evaluative implications across the three age
groups in the norming sample. Sample descriptions for each condition are
presented in Table 1.

The 16 descriptions were presented in booklet form in random order.
The target behaviors appeared first on a page by themselves, and two rating
scales followed on the next page. The first was for recording the partici-
 pant’s impression of where the target ranked on the domain of interest
(honesty or intelligence), whereas the second was used to assess the
likability of the target person. Both used an 11-point scale ranging from −5
(unlikable, unintelligent, dishonest) to 5 (likable, intelligent, honest), with
the midpoint of 0 labeled as neutral.

An exploratory questionnaire was also developed to assess the impor-
tance that individuals give to different traits and their possible impact on
age differences in trait inferences. For example, Rokeach (1973) has
observed an age-related decrease in the value placed on competence, which
in turn may reduce the amount of processing associated with competence-
related information. The questionnaire contained 20 traits, with 6 of the
traits in this list being of interest and the other 14 serving as distractors.
These 6 target traits included honesty and intelligence as well as 2 addi-
tional traits relating to morality (loyal, fairness) and 2 relating to compe-
tence (willpower, courageous). The additional 4 traits were gleaned from
morality and competency traits used by Wojciszke, Pienkowski, Maroszek,
Brycz, and Ratajczak (1993). Traits were listed along the left-hand side of
the page, and two 5-point rating scales (1 = value very little, 5 = value
very much) were listed to the right of each word, one for assessing the
importance of the trait in oneself and the other for assessing its importance
in others.

Procedure. Testing was done individually or in groups of 2 to 4.
Participants were given the booklet containing the target descriptions and
were told that they were going to be completing an impression formation
task. Participants were instructed to read the description on each page and
to form an impression of that individual. They were told that each descrip-
tion contained typical behaviors engaged in by the fictitious target. Once an
impression was formed, participants turned the page and rated the target on
the two scales presented (relevant trait domain and likability). Participants
were told not to look back at the original behaviors while making their
ratings but to base their ratings on the impression they had just formed.
Jennifer turned her odometer back before selling her car.
Jennifer told the clerk that she had been undercharged for an item.
Mike admitted to himself that he couldn’t read and enrolled in a literacy program.
Mike lost his job after he lied about the hours he had worked.
Mike accurately marked down calories on his diet chart.
Mike cheated when playing solitaire.

They were allowed to work in this fashion at their own pace until all 16 sets were completed.

Following this task, participants completed the trait-importance questionnaire. They were instructed to rate each trait on the list for themselves first and then go back and rate how much they valued each trait in other people. Participants were asked to rate specifically how much they valued the trait, not how much they (or others) actually possessed the trait.

All participants were given Vocabulary Test 2 from the Kit of Factor-Referenced Cognitive Tests (Ekstrom, French, Harman, & Derman, 1976) as well as a loaded memory span task similar to that in Hess, McGee, Woodburn, and Bolstad (1998). Participants also completed the Personal Need for Structure Scale (PNS; Thompson, Naccarato, & Parker, 1992) and the abbreviated Need for Cognition questionnaire (Cacioppo, Petty, & Kao, 1984). These two scales examine dispositionally related motivational factors associated with the desire for simple structure in everyday life and enjoyment of cognitive activity.

Results and Discussion

In all analyses both here and in Study 2, age was treated as a continuous variable and was standardized to control for potential effects due to multicollinearity (Jaccard, Turrisi, & Wan, 1990). Analyses of variance (ANOVAs) based on the general linear model were used, thereby allowing the treatment of the age variable as continuous. In addition, all analyses examined linear age effects; no significant quadratic trends were obtained in any analysis.

Participant characteristics. An examination of the background characteristics of the sample revealed relationships typical of aging. Verbal ability increased with age, \( r(144) = .26, p = .002 \), whereas performance on the working memory span task decreased with age, \( r(144) = -.42, p < .001 \). Neither PNS, \( r(144) = .08, p = .33 \), nor Need for Cognition, \( r(144) = -.10, p = .21 \), was related to age.

Trait inferences. The primary focus of this study involved an examination of trait-related inferences as a function of context. Mean trait ratings within each condition were calculated and examined with an Age \( \times \) Gender \( \times \) Trait Domain (honesty vs. intelligence) \( \times \) Focus (intrapersonal vs. interpersonal) ANOVA, with the last two variables within participants.1 Reliability (Cronbach’s \( \alpha \)) for trait ratings across the four descriptions within each Domain \( \times \) Focus condition ranged from .58 to .71.

The obtained effects with respect to domain and focus were as expected (see Table 2). Specifically, trait ratings were more negative in the honesty domain than in the intelligence domain, \( F(1, 142) = 403.46, MSE = 2.31, p < .001 \). This represents the expected diagnosticity effect, with more emphasis being given to negative behaviors in morality-related domains and more emphasis being given to positive behaviors in competence-related domains. Trait ratings were also lower when the target’s behaviors had implications for others than when they had primary implications for self, \( F(1, 142) = 48.63, MSE = 1.13, p < .001 \), but this effect varied across trait domains, \( F(1, 142) = 4.57, MSE = 0.91, p = .04 \). Specifically, other-focus had a more negative effect relative to a self-focus on trait attributions in the honesty domain than in the intelligence domain. That is, the differential emphasis on negative versus positive behaviors in constructing trait inferences across domains was exacerbated when the behaviors had implications for others.

These effects associated with domain and focus were also modified by participant age and gender. First, the expected Age \( \times \) Domain interaction was significant, \( F(1, 142) = 9.53, MSE = 2.31, p = .002 \). As is evident from Figure 1A, the difference between trait inferences across domains increased with age, reflecting the anticipated increase in the use of diagnostic information with age. Simple effects tests within domains, however, indicated that the effect was primarily due to performance in the morality domain, where trait inferences became more negative with increasing age, \( F(1, 142) = 10.61, MSE = 3.85, p = .001 \); age was unrelated to ratings in the competence domain (\( F < 1 \)).

Second, a significant Gender \( \times \) Domain \( \times \) Focus interaction was obtained, \( F(1, 142) = 4.08, MSE = 0.91, p = .05 \). Separate ANOVAs for each gender indicated that this effect was due to the previously described Domain \( \times \) Focus interaction being significant for women, \( F(1, 79) = 9.34, MSE = 0.95, p = .003 \), but not for men (\( F < 1 \)). The greater focus on interpersonal information by

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1 Although no specific hypotheses were made regarding participant gender, we thought that it would be interesting to determine whether men and women varied in their weighing of the different types of information. For example, on the basis of gender-related socialization variations, women might be more likely than men to focus on behaviors with interpersonal consequences, whereas the opposite might be true for competence-related behaviors. Thus, gender was included as a variable in all of the main analyses.

Table 1
Sample Target Descriptions by Condition

<table>
<thead>
<tr>
<th>Morality</th>
<th>Competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mike cheated when playing solitaire.</td>
<td>Chad understood the equations presented in math class.</td>
</tr>
<tr>
<td>Mike accurately marked down calories on his diet chart.</td>
<td>Chad bought himself clothes that were the wrong size.</td>
</tr>
<tr>
<td>Mike lost his job after he lied about the hours he had worked.</td>
<td>Chad lost all his money when he invested in a get rich quick scheme.</td>
</tr>
<tr>
<td>Mike admitted to himself that he couldn’t read and enrolled in a literacy program.</td>
<td>Chad earned a full scholarship to study abroad.</td>
</tr>
</tbody>
</table>

Other-focus

| Jennifer turned her odometer back before selling her car. | John set off a bug bomb in his house while people were still in it. |
| Jennifer reported all of her taxable income to the IRS. | John knew how to remove the virus from his company’s computer. |
| Jennifer kept the money from the wallet she had found. | John used the wrong data and ruined the report his group was putting together. |
| Jennifer told the clerk that she had been undercharged for an item. | John devised a way for his church to save money. |
was a marginally significant decrease in overall mean ratings with trends.

Each participant do indeed suggest a positive bias and less variability in the ratings of younger than in those of older adults. There might really exist, thereby muddying interpretation of any age inflation their ratings in the competence domain. This would give the appearance of stronger trait-diagnostic inferences in young adulthood than really exist, thereby muddying interpretation of any age effects relating to the use of diagnostic or behavioral focus information.

Women than men appears consistent with traditional gender roles in our culture (e.g., Huyck, 1990).

Finally, the critical Age × Domain × Focus interaction was not significant (F < 1), although the Age × Gender × Domain × Focus interaction was, F(1, 142) = 4.33, MSE = 0.91, p = .04. This latter effect, however, reflected relatively minor variations in age trends across conditions. Thus, there was little support for the hypothesis that increasing age would be associated with a disproportionate increase in the weighting of negative information when the target’s behaviors had primary consequences for others. In general, behavioral focus was found to affect ratings in a similar manner across the age range tested.

As noted above, an age-related increase in the use of diagnostic information was most evident in the morality domain. The generally positive ratings in competence attributions suggest stable use of trait-diagnostic information in this domain throughout adulthood. An alternative interpretation of the obtained pattern of results, however, is that there is a positive bias in the ratings of adults at the younger end of the age range, which in turn serves to inflate their ratings in the competence domain. This would give the appearance of stronger trait-diagnostic inferences in young adulthood than really exist, thereby muddying interpretation of any age trends.

Descriptive statistics calculated across the 16 descriptions for each participant do indeed suggest a positive bias and less variability in the ratings of younger than in those of older adults. There was a marginally significant decrease in overall mean ratings with age, r(144) = .16, p = .06, whereas standard deviations increased with age, r(144) = .21, p = .01. To control for these potential biases in the use of the rating scale, trait ratings for the 16 sets were standardized within participants. Mean ratings were then recalculated and analyzed as before. The obtained effects were identical to those of the original analysis. However, examination of the Age × Domain interaction, F(1, 142) = 5.41, MSE = 0.25, p = .02, revealed significant age-related increases in the use of diagnostic information in both domains (see the data and regression functions in Figure 1B).

Affective inferences. Mean likability ratings were obtained and analyzed in the same manner as were trait ratings. The reliability of likability ratings across items within conditions ranged from .52 to .69. In addition, the distribution of scores did not vary with age, with overall mean ratings and standard deviations being unrelated to age (p > .12). Significant effects were obtained for domain, F(1, 142) = 168.75, MSE = 1.14, p < .001; focus, F(1, 142) = 8.98, MSE = 1.16, p = .003; Domain × Focus, F(1, 142) = 7.71, MSE = 0.95, p = .01; and Gender × Domain × Focus, F(1, 142) = 5.61, MSE = 0.93, p = .02. Each of these effects was similar in form to those observed with trait inferences, and thus are not described in further detail. In addition, the critical Age × Domain × Focus interaction was also significant, F(1, 142) = 4.97, MSE = 0.93, p = .03. However, it was due to a nonsystematic set of age effects relating to the use of diagnostic or behavioral focus information.

It is interesting that the pattern of results associated with affective responses to targets did not exactly mirror those effects associated with trait attributions. It may reflect, in part, the varying bases for affective judgments across trait domains. Brycz and Wojciszke (1992) have argued that morality-related behaviors are more highly saturated with affect than those in the competence domain, and Wojciszke, Bazinska, and Jaworski (1998) have found that trait inferences are more predictive of evaluative judgments in the morality domain than in the competence domain. To determine whether similar patterns were present here, and to determine whether there were age differences in the impact of trait inferences on evaluations, we regressed likability responses onto age, trait rating (standardized), and their interaction within each Domain × Focus condition. Consistent with the just-cited work, the relation between trait and likability ratings was stronger in the two honesty conditions (self-focus: r = .60; other-focus: r = .60) than in the two intelligence conditions (self-focus: r = .39; other-focus: r = .48; all ps < .001). The difference between correlations was significant for the self-focus conditions (z = 2.47, p = .01) and approached significance for the other-focus conditions (z = 1.49, p = .07). Interestingly, an interpersonal behavioral focus also elevated the correlation between ratings in the intelligence condition, although the difference between correlations was not significant (p = .15).

We also found age differences in the relationship between trait ratings and likability ratings in the honesty domain, but not in the intelligence domain. Specifically, the Age × Trait Rating interaction in the other-focus condition was significant, F(1, 142) = 8.54, MSE = 1.30, p = .004, and the same effect in the self-focus condition approached significance, F(1, 142) = 3.71, MSE = 1.13, p = .06. To illustrate the nature of these effects, we followed recommendations of Jaccard et al. (1990) and decomposed these interactions by calculating the regression functions relating trait ratings to likability ratings at 1 SD below and above the mean.

### Table 2

**Study 1: Trait, Likability, and Importance Ratings as a Function of Domain and Focus**

<table>
<thead>
<tr>
<th>Focus</th>
<th>Honesty/morality</th>
<th>Intelligence/competence</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>-0.39</td>
<td>1.99</td>
<td>0.80</td>
</tr>
<tr>
<td>SD</td>
<td>1.50</td>
<td>1.39</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>-1.19</td>
<td>1.54</td>
<td>0.18</td>
</tr>
<tr>
<td>SD</td>
<td>1.75</td>
<td>1.52</td>
<td></td>
</tr>
<tr>
<td>Combined</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>-0.79</td>
<td>1.77</td>
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**Likability ratings**

<table>
<thead>
<tr>
<th>Focus</th>
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<tbody>
<tr>
<td>Self</td>
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</tr>
<tr>
<td>M</td>
<td>0.20</td>
<td>1.14</td>
<td>0.67</td>
</tr>
<tr>
<td>SD</td>
<td>1.33</td>
<td>1.49</td>
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<tr>
<td>Others</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>M</td>
<td>-0.33</td>
<td>1.09</td>
<td>0.38</td>
</tr>
<tr>
<td>SD</td>
<td>1.44</td>
<td>1.43</td>
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</tr>
<tr>
<td>Combined</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>-0.07</td>
<td>1.12</td>
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</table>

**Trait importance ratings**

<table>
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<th>Focus</th>
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<tbody>
<tr>
<td>Self</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.61</td>
<td>4.14</td>
<td>4.38</td>
</tr>
<tr>
<td>SD</td>
<td>0.59</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.55</td>
<td>3.81</td>
<td>4.18</td>
</tr>
<tr>
<td>SD</td>
<td>0.60</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>Combined</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.58</td>
<td>3.98</td>
<td></td>
</tr>
</tbody>
</table>
sample age (approximately 32 and 67 years old). Comparisons of the slopes of these functions (Table 3) clearly indicate that the just-cited interactions reflect the fact that trait-diagnostic information has a smaller impact on the affective responses of older adults than on those of younger adults.

**Trait value.** In the final set of analyses, we explored variations in the importance attributed to specific trait domains. To do this, mean ratings for the three morality traits and the three competence traits were obtained and then examined by using an Age × Gender × Trait Domain × Target (self vs. others) ANOVA. Significant effects were obtained for domain, \( F(1, 142) = 153.80, MSE = 0.33, p < .001 \), and target, \( F(1, 142) = 35.06, MSE = 0.16, p < .001 \), with morality-related traits receiving higher value ratings than competence-related traits, and ratings being higher for self than for others. A significant interaction between these two variables, \( F(1, 142) = 24.64, MSE = 0.12, p < .001 \), reflected the fact that morality-related traits were valued at similar levels for self and others (\( p = .13 \)), whereas intelligence was valued significantly more in self than in others, \( F(1, 142) = 41.79, MSE = 0.20, p < .001 \) (see Table 1).

A significant Age × Domain interaction was also obtained, \( F(1, 142) = 4.42, MSE = 0.33, p = .04 \). This reflected a weak tendency for value ratings to increase with age for morality traits (\( r = .12 \)) and to decrease for competence traits (\( r = -.05, p = .13 \)), although neither of these effects was significant. Finally, domain interacted with participant gender, \( F(1, 142) = 4.31, MSE = 0.33, p = .04 \), because of women’s morality ratings being somewhat higher than those of men (4.61 vs. 4.53) and their competence ratings being somewhat lower than those of men (3.92 vs. 4.05). Once more, these differences are consistent with traditional gender roles in our society. For both genders, ratings of morality traits were significantly higher than those of competence traits (\( p < .001 \)).

Our primary interest in collecting these data was to determine whether the value attributed to specific trait domains could account for the use of diagnostic information in trait inferences and age differences therein. For example, high importance attributed to a specific trait domain might increase the salience of behavioral information relating to that domain. This, in turn, could increase the probability of processing trait-diagnostic information. When correlations were examined between trait value ratings within domain (averaged across self and others) and trait inferences within each Domain × Focus group, several significant correlations were observed that were consistent with expectations. Specifically, valuing competence was positively correlated with both trait inferences (\( r = .15, p = .04 \)) and likability ratings (\( r = .17, p = .03 \)) for self-focused behaviors in the intelligence domain. In contrast, a significant negative correlation (\( r = -.14, p = .05 \)) was observed between valuing morality-related traits and likability for other-focused behaviors in the honesty domain. In other words, the importance attached to a particular trait domain was reflected, although not strongly, in increased weighting of trait-diagnostic information in constructing trait inferences in that domain. When we examined the role of value ratings in accounting for impressions by using either commonality regression analyses or analyses of covariance, however, there was little evidence that age differences in the value attributed to specific trait domains accounted for age-related variability in trait inferences or likability ratings in any condition.

In summary, the results of this study are consistent with those of previous research in demonstrating that the use of trait-diagnostic information in impression formation increases with age in adulthood. In addition, although the focus of the targets’ behaviors influenced the construction of trait judgments, this factor did not

### Table 3: Regression Functions for Prediction of Likability Ratings (y) From Trait Ratings (x) in the Morality Domain

<table>
<thead>
<tr>
<th>Group</th>
<th>Self-focus</th>
<th>Other-focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger adults</td>
<td>( y = 0.35 + 0.67x )</td>
<td>( y = 0.39 + 0.66x )</td>
</tr>
<tr>
<td>Older adults</td>
<td>( y = 0.40 + 0.42x )</td>
<td>( y = 0.02 + 0.34x )</td>
</tr>
</tbody>
</table>

**Figure 1.** Study 1: The relationship between age and (A) raw and (B) corrected trait ratings. Regression equations are provided below each panel. int = intelligence; hon = honesty.
vary in salience across the age range tested. Likewise, the importance attributed to traits within domains was not strongly predictive of the use of trait-diagnostic information nor age-related variations therein. Thus, variations in the value attached to specific traits do not explain the observed age differences in social inferences.

The data also revealed general patterns of performance consistent with expectations derived from mainstream social psychology, with one apparent exception. Specifically, although the presence of target behaviors having implications for others reduced both trait and likability ratings, evaluations of targets in the intelligence domain continued to be positive. This appears to contradict expectations derived from Peeters (1983) and Wojciszke (1997), where behaviors having negative implications for others should result in negative impressions of the target. The current findings suggest a more complex scenario with respect to impression ratings, with the weighting of behavioral focus information perhaps being dependent on the evaluation context. For example, although a target’s intelligence-related behaviors may have had a negative impact on others, participants were asked to evaluate the target’s intellectual capability rather than some aspect of morality. This, in turn, may have affected the immediately following likability ratings. It seems conceivable that the impact of a self- versus other-focus may be more evident in situations where participants rate only the likability of the target or in situations where participants are given the freedom to construe the target in morality-based terms (e.g., Wojciszke, 1994), in which turn would increase the focus on negative behavioral information.

Study 2

The results of the initial study were noteworthy in two ways. First, they replicated previous findings (Hess et al., 1999; Hess & Pullen, 1994) regarding the differential use of trait-diagnostic information with age by using a simpler and more straightforward assessment technique. This replication demonstrates the robustness of this finding across quite different assessment contexts. Second, conditions (i.e., the inter- vs. intrapersonal consequences of the target’s behaviors) were identified that modified the use of trait-diagnostic information but did not alter the observed age effects. These results are informative in that they help eliminate potential explanations of the observed age effects, further reinforcing the suggestion that the pattern of performance reflects age differences in social expertise rather than responses to specific situational factors.

Study 2 continues our examination of age differences in impression formation, with three goals. First, we investigated whether the age effects in attention to trait-diagnostic information observed in judgments were also present at the process level. If the observed age effects in judgments reflect variations in procedural knowledge, then age differences may be apparent in patterns of attentional allocation. For example, research on category learning (e.g., Livingston & Andrews, 1995) has shown that expertise is associated with changes in attention allocation, with increases in experience being associated with both greater attention to stimulus attributes that are diagnostic for category membership and increased discrimination between diagnostic and nondiagnostic attributes. Consistent with this result, and especially relevant for the present research, Reeder and Coov (1986) found that individuals spent more time reformulating their impressions when new immoral information was presented about a target previously depicted in moral terms than when new moral information was presented about an immoral target. In other words, the degree of processing was associated with the information value of the new information, with more updating occurring for new diagnostic information.

In the present case, the development of social expertise in adulthood might be reflected in such differential attention allocation increasing with age. Specifically, older adults might spend a disproportionately greater amount of time than younger adults processing negative information in the morality domain and positive information in the competence domain. Such a pattern of results may reflect age differences in the accessibility of information about diagnosticity, with trait-diagnostic behaviors activating relevant interpretive structures, in turn prompting more extensive consideration of these behaviors relative to nondiagnostic behaviors.

Our second goal was to further examine factors that might determine age differences in the use of trait-diagnostic information. One such factor concerned the extent to which in-group/out-group processes might determine the nature of trait inferences. Specifically, Hess, Rosenberg, and Waters (in press) observed that trait-diagnostic inferences are somewhat more likely for age-dissimilar (out-group) targets than for age-similar (in-group) targets. Such a pattern of performance might make sense if trait-diagnostic inferences are characterized as dispositional attributions, which in turn are more prevalent for out-group members (e.g., Hewstone, 1989) because perceivers are less likely to engage resource-demanding corrective mechanisms associated with later stages of the attributional process. For example, Gilbert, Pelham, and Krull (1988) found that individuals under cognitive load are more likely to attribute a target’s behavior to his or her disposition than individuals not under load, who in turn are more likely to consider the situation as a determining factor. Indeed, Wojciszke (1994) has provided some evidence showing that the weighting of trait-diagnostic information in social evaluation is stronger if the participant assumes the role of an observer rather than an actor. If targets in previous research were perceived as younger adults, which could easily be the case on the basis of inspection of the stimuli in Hess et al. (1999), then the observed age differences in use of trait-diagnostic information might represent nothing more than a group-based psychological phenomenon. In the present study, we assessed this possibility by comparing trait inferences when the target was characterized as similar or dissimilar in age to the participant. If previously observed age trends reflect a developmental change in social expertise, then they should be observed regardless of the target’s age. In contrast, if in-group/out-group processes are the primary determinants of trait-diagnostic inferences, then the similarity of the participant to the target should be more important in influencing performance than participant age.

Finally, we once again examined the influence of trait importance on the use of trait-diagnostic information and age differences therein. Although Study 1 suggested that attributions of trait value had only a minor impact on impression formation, it could be argued that our method of assessing value was problematic. Specifically, conscious judgments associated with experimenter-provided traits might not accurately reflect the importance of specific trait constructs in everyday social situations. To deal with
this concern, we assessed importance in a more indirect fashion by using a procedure developed by Higgins, King, and Mavin (1982), in which the relative accessibility of personality attributes relating to morality versus competence was measured. Accessibility was measured by having participants list traits typically associated with different types of people (e.g., someone they liked), with those produced first in the list being deemed most accessible. Highly accessible traits, as assessed in this manner, have been shown to influence the types of social inferences made by perceivers (see Higgins, 1996). Thus, accessibility may be a more valid measure of the types of trait constructs that are spontaneously activated during social information processing. If trait-diagnostic inferences are simply associated with the accessibility of relevant trait constructs and age differences exist in the types of constructs that are accessible, then controlling for simple accessibility should eliminate these differences.

Method

Participants. A total of 100 adults (54 women, 46 men) aged 21 to 82 years participated in this study. All were recruited and compensated as in Study 1. The participants of each gender were distributed relatively evenly across the age range tested, with 16 (8 men) aged 20 to 29, 16 (6 men) aged 30 to 39, 18 (8 men) aged 40 to 49, 18 (9 men) aged 50 to 59, 17 (8 men) aged 60 to 69, and 15 (8 men) aged 70 to 82. Participants had a mean of 16.1 (SD = 2.39) years of formal education, and level of education was unrelated to age, r(98) = −.04. Additionally, age was negatively associated with physical health, r(98) = −.30, p = .003, but positively associated with mental health, r(98) = .22, p = .03. These data were calculated from scale scores obtained from the SF-36 Health Survey (Ware, 1993).

Materials. Twenty-four target behavior descriptions and eight filler descriptions similar to those in Study 1 were developed for this study. Twelve target descriptions depicted behaviors relating to honesty and 12 similar to those in Study 1 were developed for this study. The behaviors used in the target descriptions were selected from a group of 175 behaviors (82 honesty related and 93 intelligence related). Ninety-nine of these behaviors were also used in Study 1. The 76 new behaviors were initially presented to an independent sample of 12 young, 10 middle-aged, and 14 older adults, and ratings were obtained as in Study 1.

Trait-representativeness and evaluation scores for individual behaviors were once again used to construct the descriptions containing two negative (both for representativeness and evaluation) behaviors and two positive behaviors from the same trait domain. Because focus did not have system-represented behaviors relating to intelligence. The behaviors used in the target descriptions were randomly chosen and were not subjected to the same constraints as were behaviors in the target descriptions. These were interspersed within each presentation set and were included to discourage the development of expectations related to the domains of interest.

Procedure. Testing was done individually. Participants were seated in front of the computer and told that they were going to be completing an impression formation task. They were instructed to read each piece of information presented on the screen and try to form an impression of that individual. For each description, the target name and age appeared first on the screen. Each behavior then appeared individually, and participants were allowed to control the presentation rate by pressing the space bar when they were ready to advance. Participants were instructed to read each behavior carefully because once they had moved to the next behavior they could not go back and reread the target’s previous actions. The time spent reading each item was recorded. After all five pieces of information had been read, a 5-point trait rating scale from −2 (dishonest, unintelligent) to 2 (honest, intelligent) appeared on the screen, and participants pressed the appropriate button on a five-key response box to indicate their rating. This was then replaced by a similar scale going from −2 (unlikable) to 2 (likable), and participants once again pressed the appropriate button to indicate how much they liked the target. Participants worked at their own pace, and this procedure was followed for each of the 32 descriptions, which were presented in random order. Presentation of the six different stimulus sets was systematically varied across participant age, so that each of these sets was viewed about the same number of times (±1) both within and across age decades.

Prior to coming to the lab, participants completed the trait-generation task that was designed to assess the chronic accessibility of specific traits (i.e., our indirect measure of accessibility). Participants listed up to 10 traits of people they (a) liked, (b) disliked, (c) sought out, (d) avoided, and (e) frequently encountered. Each type of person was listed on a separate piece of paper along with 10 blank spaces for participants to write traits. The trait-generation task was mailed to participants and completed at home. The pages containing the trait-generation task were randomly arranged and included as part of a background questionnaire, which was filled out and then mailed back to the lab before testing. Participants also completed the same vocabulary test used in Study 1, as well as the PNS and Need for Cognition scales. The Wechsler Adult Intelligence Scale–III Letter–Number Sequencing task (Wechsler, 1997) was also administered to assess working memory functioning.

Results

Participant characteristics. Once again, sample participants displayed characteristics consistent with known aspects of aging. Verbal ability increased with age, r(98) = .31, p = .001, whereas performance on the Letter–Number Sequencing task decreased with age, r(98) = −.22, p = .03. Age was also unrelated to PNS, r(98) = .06, and Need for Cognition, r(98) = −.05, ps > .55.

Trait inferences. Mean trait ratings were obtained as before and examined with a Participant Age × Gender × Trait Domain × Target Age ANOVA, with the last two variables within participants. Target gender was initially included as a within-participants variable in all analyses, but no systematic effects were obtained here or elsewhere. Thus, this variable is not considered further. Interitem reliabilities for responses within each Domain × Target Age condition ranged from .50 to .61.

Only two significant effects emerged from this analysis. As anticipated, trait inferences varied as a function of domain, F(1, 96) = 165.72, MSE = 0.60, p < .001, with ratings regarding
intelligence being more positive than those regarding honesty (Table 4). In addition, the predicted Participant Age × Domain interaction was significant, $F(1, 96) = 8.29, MSE = 0.60, p = .01$ (see Figure 2A). Consistent with expectations, ratings in the honesty domain became more negative with age ($r = -.31, p = .01$), suggesting an increasing role of diagnostic information in the construction of trait inferences. In contrast, there was a small but nonsignificant increase in trait ratings in the intelligence domain with age ($r = .03, p = .19$), with individuals of all ages making generally positive judgments. Importantly, for the purposes of this research, there was no evidence of age-related variation in the use of diagnostic information in relation to the stated age of the target.

As in Study 1, age differences existed in the use of the rating scale, which in turn could have masked variations in the use of diagnostic information in constructing judgments across domains. Descriptive statistics (mean and standard deviation) were once again calculated across all 24 descriptions for each participant, and each measure was examined in relation to age. Significant linear and quadratic age effects were found to be associated with standard deviations, total $R^2 = .13, F(2, 96) = 6.87, p = .01$, reflecting an increase in response variability with age, especially between young adulthood and middle age. Age was also associated with a marginally significant decrease in overall mean ratings ($r = -.15, p < .07$). Thus, to correct for potential biases in scale use, ratings across the 24 descriptions were standardized within participants, and mean ratings were once again calculated for each condition by using these standardized ratings.

No new effects emerged from this analysis, but, as in Study 1, the form of the Age × Domain interaction, $F(1, 96) = 5.62, MSE = 1.46, p = .02$, was altered. Specifically, a significant age-related decrease in ratings in the morality domain was once again observed along with a significant ($p < .03$) increase in ratings in the competence domain (see the data and regression functions in Figure 2B). Thus, there is evidence for age-related increases in the use of trait diagnostic information in both trait domains when biases in scale use were controlled.

**Affective inferences.** Mean likability ratings were analyzed in the same fashion as trait ratings. Reliabilities across target descriptions within conditions ranged from .48 to .64. Once again, a significant effect due to trait domain was obtained, $F(1, 96) = 130.51, MSE = 0.31, p < .001$, with likability ratings being higher for intelligence-related scenarios than for honesty-related scenarios (Table 4). A significant participant age effect was also obtained, $F(1, 96) = 7.91, MSE = 1.17, p = .01$, with ratings in general decreasing with age. The only other effect obtained was a significant Participant Age × Domain × Target Age interaction, $F(1, 192) = 4.58, MSE = 0.16, p = .02$. Separate ANOVAs conducted within domains indicated that this effect was primarily due to variations in responses in the honesty domain, where significant effects due to participant age, $F(1, 96) = 9.21, MSE = 0.80, p = .01$, and its interaction with target age, $F(1, 192) = 4.93, MSE = 0.20, p = .01$, were obtained. Further examination of the data indicated that likability ratings became more negative with age ($r = -.30, p = .01$) and that this effect was especially pronounced for young targets ($r = -.41, p < .001$) in comparison with middle-aged ($r = -.10, p = .25$) and older ($r = -.20, p = .05$) targets. In the intelligence domain, only the participant age effect approached significance ($p = .06$). These findings suggest once again that likability judgments associated with morality become increasingly influenced by diagnostic information across the adult life span, but that the impact of diagnosticity is moderated somewhat by the age of the target.

As with trait ratings, there was evidence of age-related variation in the use of the rating scale. Age was negatively associated with overall mean ratings ($r = -.18, p = .04$) and positively associated with standard deviations ($r = .22, p = .02$). Adjusting for the differences in scale use, however, did not alter the pattern of results.

Consistent with the results of Study 1 and with those of Wojciszke et al. (1998), likability ratings were more strongly related to trait ratings in the honesty domain ($rs = .63, .59$, and $.72$ for the young, middle-aged, and old targets, respectively) than in the intelligence domain ($rs = .38, .47$, and $.40$, respectively; all $ps < .001$). Correlations in the honesty domain were significantly greater than those in the intelligence domain for the young ($z = 2.62, p = .01$) and the old ($z = 3.56, p < .001$) targets, but not for the middle-aged targets ($z = 1.21, p > .12$). Unlike Study 1, however, the relationship between ratings was not moderated by participant age.

**Reading times.** Reading times for individual behaviors were examined next to determine whether individuals accorded different amounts of attention to similarly valenced behaviors across domains. We were primarily interested in determining whether the just-discussed age-related variations in weighting of positive and negative information across domains might also be reflected in patterns of attention allocation. Reading times were calculated by first dividing individual reading times by the number of words in the target behavior, eliminating individual times that were ± 3 SDs.
from the overall mean for each participant, and then averaging across similarly valenced behaviors within conditions. These mean times were then examined with a Participant Age × Gender × Trait Domain × Target Age × Behavior Valence ANOVA.

As would be expected, reading times increased with participant age, $F(1, 96) = 17.22$, $MSE = 108.275$, $p < .001$. In addition, positive behaviors ($M = 321$ ms, $SD = 103$) were read more slowly than negative behaviors ($M = 311$ ms, $SD = 105$), $F(1, 96) = 18.10$, $MSE = 1.792$, $p < .001$, and behaviors relating to honesty ($M = 320$ ms, $SD = 107$) were read more slowly than those relating to intelligence ($M = 312$ ms, $SD = 102$), $F(1, 96) = 12.45$, $MSE = 1.453$, $p = .001$. A significant interaction was also obtained between these two variables, $F(1, 96) = 112.19$, $MSE = 1.719$, $p < .001$, reflecting greater attention to trait-diagnostic behaviors than to nondiagnostic ones within domains. Specifically, reading times were slower for negative than for positive behaviors relating to honesty, whereas the difference was reversed for intelligence-related behaviors (see Table 4).

The Age × Domain × Valence interaction only approached significance, $F(1, 96) = 2.91$, $MSE = 1.411$, $p = .09$. Given our interests, however, we tested for the presence of an Age × Valence interaction within each domain. This interaction was significant in the competence domain, $F(1, 98) = 4.90$, $MSE = 429$, $p = .03$, where the slope ($b$) of reading time regressed onto age was significantly larger for positive behaviors ($b = 2.60$) than for negative behaviors ($b = 2.20$). The interaction was not reliable in the morality domain ($F < 1$), although the difference in slopes was in the expected direction: positive, $b = 2.47$; negative, $b = 2.59$. Thus, there was some evidence that differential allocation of attention in favor of trait-diagnostic information was more prevalent with increasing age, particularly in the competence domain. This corresponds with the obtained patterns of age-related effects in trait inferences.2

Trait accessibility. In the final analysis, we attempted to identify potential age differences in the types of trait constructs that were most accessible to individuals, with the intent of linking accessibility to the use of diagnostic information in constructing judgments about others. To do this, we categorized all responses produced by participants to the five trait accessibility questions on the basis of both the type (competence, morality, or other) and valence (positive vs. negative) of the trait term. Prior to scoring, a list of traits was established for each category, and this list was used to classify individual responses. In developing this list, we used the criteria and associated examples for competency or morality provided by Wojciszke (1997). Specifically, morality-related traits were defined as “those which pertain to breaking or maintenance of moral rules and/or to doing good or bad things for another person” (p. 249), whereas competence-related traits were defined as “those which enable people efficiently to attain their goals or obstruct the goal attainment, whatever the goals may be” (p. 249). The third category of traits contained items that did not fit into either of these categories, such as traits associated with physical characteristics (e.g., handsome). Valence of these trait terms was determined by N. H. Anderson’s (1968) likableness norms, using the midpoint of the likability scale as a cutoff. Individual participant responses were then categorized by using this list as a guide. The overwhelming majority of participant responses were included in this list. In the rare cases where a new trait term was produced, its type and valence was determined through consensus. In all cases, scorers were blind to the participant’s age, although the nature of the scoring procedure almost precluded the introduction of biases.

Figure 2. Study 2: The relationship between age and (A) raw and (B) corrected trait ratings. Regression equations are provided below each panel. int = intelligence; hon = honesty.

1 It could be argued that the obtained age effects reflect general slowing rather than effects associated with specific processes. If this were true, however, we would expect to see age interact with any variable that was associated with longer study times. This was not the case. For example, a significant Gender × Domain interaction was obtained, $F(1, 96) = 6.54$, $MSE = 2.073$, $p = .02$, with the difference in reading times for honesty and intelligence behaviors being greater in men (341 ms vs. 327 ms) than in women (302 ms vs. 299 ms). The magnitude of this effect, however, was not moderated with age ($F < 1.0$).

2
Consistent with past research (e.g., Higgins et al., 1982), it was assumed that those items produced early in each list reflected the most accessible items. Thus, our analyses focused on the proportion of all traits produced in the first half of each of the five lists that related to competence or morality. These proportions were then examined with an Age X Gender X Trait Domain X Trait Valence ANOVA.

More morality traits were produced than competence traits (.50 vs .31), \( F(1, 96) = 30.70, \text{MSE} = 0.03, p < .001 \), and more positive traits were produced than negative traits (.44 vs .38), \( F(1, 96) = 12.45, \text{MSE} = 0.01, p = .001 \). A significant Domain X Valence interaction was also obtained, \( F(1, 96) = 7.33, \text{MSE} = 0.02, p = .01 \), because of more positive than negative traits being produced in the competence domain (.19 vs .12), but not in the morality domain (.25 vs .25). Of most interest, however, was a significant Age X Domain interaction, \( F(1, 96) = 8.49, \text{MSE} = 0.03, p = .01 \). Separate analyses within domains indicated that the proportion of morality-related traits increased with age \((r = .28, p = .01)\), whereas that for competence-related traits decreased \((r = -.22, p = .04)\). To illustrate this age-related variation, we calculated the predicted proportion of each type of trait for age at 1 SD below and above the mean age of the sample.

For the lower age (approximately 33 years), the predicted proportions of traits were .43 and .36 for the morality and competence domains, respectively. In contrast, the same predicted scores for the higher age (approximately 67 years) were .53 and .29. Thus, the trend goes from making little distinction between the two types of traits early in adulthood to greater accessibility for morality traits in later life.

Regression analyses were then used to examine the relationship between accessibility and trait inferences. The first analysis indicated that the proportion of accessible morality traits was negatively related to trait ratings in the morality domain \((r = -.26, p = .02)\). In other words, accessibility to morality traits increased the weighting of diagnostic (i.e., negative) information in constructing trait inferences. Accessibility also accounted for 37% of the age-related variance in these ratings, indicating that the increased accessibility to moral traits associated with aging also accounted for some of the age-related variance in the use of trait-diagnostic information. Note, however, that age continued to account for significant variance even when accessibility was controlled. A similar trend was observed for likability scores, where accessibility accounted for 24% of the age-related variance in the morality domain. Interestingly, accessibility to competence traits was unrelated to trait or likability ratings \((ps > .23)\) and accounted for little age-related variability.

In summary, the results of this study were generally consistent with those of the first in replicating age effects associated with the use of trait-diagnostic information in making social inferences and in finding that these effects were unaffected by specific characteristics of the target. In addition, whereas age was associated with differences in trait accessibility, these variations accounted for only a relatively small amount of the age-related ratings variance. Thus, the age effects associated with the use of trait-diagnostic information cannot be accounted for simply through the increased attention to trait-relevant information brought about by increased accessibility of that domain. Importantly, age differences were observed not only in ratings made by participants but also in patterns of attentional allocation during study of target information. Although the effect was not strong, participants tended to spend more time processing trait-diagnostic than nondiagnostic information, with this difference increasing with age.

**General Discussion**

Research has suggested that development in adulthood is associated with adaptive changes in social-cognitive functioning. In this report, we presented the findings of two studies that addressed one specific aspect of such functioning: the ability to make inferences about other people on the basis of their behavior. These two studies replicate previous findings by Hess and colleagues (Hess et al., 1999; Hess & Pullen, 1994) in demonstrating that age differences exist in the type of information that is used in constructing such inferences. Specifically, aging is associated with an increase in the use of trait-diagnostic information in making judgments about others. If beliefs about trait diagnosticity reflect cultural norms regarding the bases for behavior, then these findings can be viewed as evidence of an age-related increase in adaptive functioning. In effect, aging appears to be associated with increased expertise in the social domain as reflected in the ability to discriminate between more and less informative aspects of individuals' behaviors.

In addition, the present investigation extends previous research in this area in several ways. First, the age-related effects associated with the use of trait-diagnostic information were obtained by using a much simpler assessment technique than that used in earlier research (e.g., single judgments for each description, no concurrent memory task). This replication helps to establish the reliability of this effect across diverse assessment contexts.

Second, we found that the age effects associated with the use of trait-diagnostic information were relatively unaffected by several other factors that have been shown to influence the extent to which individuals attend to positive versus negative aspects of others' behavior. Specifically, manipulation of behavior impact (on self vs. others) and age of the target did not alter the basic nature of the age effects. These factors did not interact with participant age except in one case, where the strength, but not the form, of the age-related diagnosticity effect on likability ratings was affected by target age. This pattern of results suggests that the observed effects reflect something unique about aging rather than some general social psychological phenomenon having to do with, for example, the perception of in-group versus out-group members. In addition, although there was some suggestion that weighting of diagnostic information within a specific trait realm was related to the importance or accessibility of that domain to the individual, these factors did not explain away the observed age effects.

Third, a correspondence was observed between age differences in the weighting of trait-diagnostic information in making trait attributions and differential attention to such information during initial processing. Thus, relative to younger adults, older adults tended to allocate a disproportionate amount of attention to negative morality behaviors and positive competence behaviors at study. This finding suggests that age differences exist in the perception of the information value of different behaviors when they are initially encountered, implying that the subsequent age differences in judgments were in part based on these perceptions. On the surface, the disproportionately greater study time allocated to diagnostic information with age appears to be inconsistent with
existing ideas in which expertise is associated with facilitations in processing speed (see Bosman & Charness, 1996). It should be noted, however, that the time data in our research are associated with study rather than response phases of performance. Knowledge has been shown to be associated with greater attention to informative versus uninformative information during study in a variety of contexts (e.g., scripted activities [Hess & Tate, 1992]; scenes [Hess & Slaughter, 1990]). Finally, it is difficult to apply some of the same criteria used in distinguishing between experts and non-experts in situations with well-defined knowledge bases and performance standards to the social realm. In this latter context, everyone might view themselves as experts, and variations in expertise may be reflected not in how fast someone arrives at a decision but rather how they go about constructing it. In this case, variations in the consideration of diagnostic versus nondiagnostic information in terms of both judgments and attentional allocation appear to be reasonable markers of expertise.

Our findings are generally consistent with a view of social-cognitive functioning and aging in which adult development is associated with the acquisition of social expertise. Similar to Staudinger and Pasupathi's (2000) characterization of social-cognitive functioning in terms of the development of life pragmatics, the observed age effects might best be conceptualized in terms of increasing expertise. Specifically, knowledge about the trait-diagnostic value of specific types of behavioral information can be viewed as a type of declarative knowledge reflecting cultural beliefs and norms. On the basis of research showing that age differences in the understanding of the diagnosticity of individual behaviors are minimal (Hess et al., 1999), it can be inferred that such declarative knowledge is present throughout adulthood. The fact that age differences exist, however, in the weighting of this information during impression formation suggests that the observed age effects may reflect the development of specific procedural knowledge regarding the application of the declarative knowledge. Such a view is consistent with most characterizations of skill development (e.g., J. R. Anderson, 1983) in which the development of procedural knowledge is preceded by the acquisition of declarative knowledge. The reading time results from Study 2 are also supportive of this interpretation, if variations across domains in the attention allocated to positive and negative behaviors are assumed to reflect the accessibility and activation of interpretive structures containing knowledge regarding trait diagnosticity.

One interesting aspect of the results concerns the apparent inconsistency in the age effects associated with the use of diagnostic information in morality versus competence realms. When raw trait attributions are examined, age effects are evident primarily in the morality domain. A similar trend was observed by Hess et al. (1999), but mostly when contrasting older adults with younger adults; middle-aged adults weighted trait-diagnostic information more than did younger adults regardless of domain. One possible explanation for this effect might be related to the increased importance attached to matters of morality and decreased importance attached to matters relating to competence with age. However, whereas this age-related variation in the relative importance and accessibility of trait domains did account for some age-related variability in performance, the influence was relatively small.

Alternatively, we have suggested that this inconsistency across domains in the present research reflected a measurement artifact related to a positive bias in the ratings of younger adults. Such a bias may have masked age differences in the competence domain, where positive information is diagnostic, by elevating ratings to a level suggestive of disproportionate attention to trait-diagnostic information. The fact that significant age differences in attention to diagnostic information during initial processing were obtained further reinforces the interpretation of the null age effects in ratings reflecting some measurement artifact. When we corrected for this assumed bias, age-related increases in the weighting of diagnostic information in the construction of trait attributions were evident in both domains.

Although the importance and accessibility associated with trait domains did not appear to be the primary mechanism underlying the observed age effects in impression formation, two interesting findings associated with these data did emerge. First, the value attributed to and the accessibility of traits in the morality domain increased with age, whereas these same factors decreased with age in the competence domain. Such findings are consistent with other data in suggesting that achievement and career issues become relatively less important with age in adulthood, particularly in late life, whereas interpersonal and family relationships tend to increase in relative importance (e.g., Carstensen, 1992; Rokeach, 1973; Ryff, 1989). With respect to social–cognitive functioning, our data are particularly intriguing given the relationship between accessibility and performance (see Higgins, 1996). Specifically, the differential accessibility of trait constructs across adulthood suggests that individuals of different ages will interpret identical behaviors in different ways, reflecting this variation in accessible interpretive structures. In addition, age differences may exist in the factors considered in making judgments about people. Consistent with this view and with our findings regarding trait accessibility, for example, Avolio and Waldman (1989) found that supervisor age was associated with increasing importance attached to human relations and decreasing importance attached to technical skills in evaluating employee performance.

The second interesting finding is that accessibility and importance were related to the use of trait-diagnostic information in constructing judgments, at least in the morality domain. These results are consistent with a social expertise view relating to trait-diagnostic inferences, to the extent that importance might be considered reflective of level of declarative knowledge and accessibility might be considered reflective of procedural knowledge. These findings are also relevant to the just-preceding discussion. Specifically, although variations in importance and accessibility did not appear to be the primary determinants of the observed age trends in performance, significant age-related variance in the use of trait-diagnostic information was accounted for by domain accessibility in Study 2.

One perplexing aspect of the present results concerns the inconsistency in effects when trait attributions are compared with likability ratings. Specifically, age effects were more prevalent with the former measure than with the latter, in spite of significant correlations between them. Hess et al. (1999) observed a similar trend, although age differences in the use of trait-diagnostic information were still obtained when likability was examined. As noted earlier, the lack of correspondence is not unexpected given the different bases for construction of likability judgments across trait
domains (Wojciszke et al., 1998). It is also not too surprising that
trait-diagnostic information is less evident in likability ratings than
trait inferences given the more direct applicability in the latter
context. This, in turn, may account for the absence of age effects in
the use of such information in making affective inferences.

There was also evidence in Study 1 for age-related variability in
the relationship between trait and likability ratings, with greater
concordance between the two being observed in younger adults. It
may be possible to interpret this effect in terms of age differences
in social expertise. Wyer and Srull (1989) have argued that, while
forming impressions, individuals create separate evaluative and
trait-based representations from the target’s behaviors. If younger
adults place relatively greater weight on behavior valence and less
on the diagnostic value of behaviors in making trait inferences,
then judgments derived from these two representations should be
similar because they are based on similar information. That is, the
trait-based representation will contain similar levels of positive
and negative information, as will the evaluative representation.
In contrast, the increased expertise in older adults would lead them to
emphasize diagnosticity in their trait representations, while not
necessarily affecting evaluations of individual behaviors. Thus,
less concordance across ratings would be expected because their
trait representations would be weighted to reflect the trait diag-
nosticity of behaviors (e.g., dishonesty or intelligence), whereas
their evaluative representations would reflect the valence of the
target’s behaviors.

In conclusion, the results of the present research are consistent
with a growing body of research suggestive of an increase in the
adaptive nature of social–cognitive functioning in adulthood. Our
findings, along with those of other researchers (e.g., Blanchard-
Fields, 1994; Heckhausen, Dixon, & Baltes, 1989; Hummert et al.,
1994), appear to reflect increasing sophistication in the processing
and representation of social information with age in adulthood.
In the present case, we have argued that this sophistication is in terms of
the development of declarative and procedural knowledge regard-
ing the factors underlying the behavior of others. In addition to
the generally adaptive nature of such knowledge in social
situations, the value of social expertise is also noteworthy when
viewed within the context of an aging-related increase in cognitive
constraints on social information processing (Hess, 2000). Specif-
ically, the development of procedural knowledge about social
behavior should ease demands on limited cognitive resources
through relatively automatic access to powerful interpretive
structures that allow the individual to focus resources on important
information. Finally, in addition to the hypothesized age-related
changes in social expertise, the present research also highlights
developmental variation in the accessibility of relevant knowledge
structures. Given the relationship between accessibility and rep-
resentation, such findings emphasize the importance of understand-
ing the role of knowledge-based factors in determining age differ-
ences in social–cognitive functioning (Hess, 1999). Of interest for
future research are (a) the bases for this variation in accessibility
and (b) the potential impact on representational processes.

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