

Aging, Cognitive Complexity, and the Fundamental Attribution Error

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Age differences in the prevalence and underpinnings of the fundamental attribution error were examined. Young, middle-aged, and older adults observed an actor providing responses to questions about political issues. In the no-choice condition, the actor was instructed how to respond, whereas in the choice condition, he was allowed to select his response. Consistent with previous research, middle-aged adults were less prone to the fundamental attribution error than were young and older adults. This was evidenced by their reduced tendency to make attitude attributions in the no-choice condition relative to the choice condition. Although high levels of both cognitive and attributional complexity were associated with reductions in attributional bias, complexity did not systematically account for the between-age-group differences in performance. It is suggested that the observed pattern of age effects is related to variations in both cognitive complexity and cognitive resources.

A major issue in the study of adult development concerns the relationship between aging and everyday functioning. Substantial evidence exists for aging-related cognitive decline, which suggests that functioning should be negatively affected with increasing age in adulthood. Research on social-cognitive processes, however, has demonstrated that the relation between age and the ability to think effectively in everyday life is not straightforward. For example, negative changes in controlled processing mechanisms appear to make older adults' social judgments more susceptible to irrelevant information (e.g., Chen & Blanchard-Fields, 2000; Hess, McGee, Woodburn, & Bolstad, 1998), whereas at the same time age-related increases in knowledge about the social world appear to provide the basis for more adaptive social inferences (e.g., Blanchard-Fields, 1994; Hess & Auman, 2001). If effective social functioning is predicated on one's ability to make accurate inferences about the behavior of other people, it is imperative that we understand the nature of and causal mechanisms underlying age-related variations in this ability.

One aspect of social-cognitive functioning that is receiving increasing attention in studies of aging concerns biases that individuals exhibit in making decisions and judgments. Such biases distort the inferential process and negatively affect the accuracy of social inferences. Thus, the possibility of age-related variations in the frequency with which individuals exhibit such biases has important implications for adaptive functioning in the social world. One type of social inference that has been shown to be susceptible to biases concerns the process by which the social perceiver seeks to find the causal explanation for events (i.e., attribution; e.g., Gilbert, Pelham, & Krull, 1988; Hansen, 1980; Kulik, 1983; Shaver, 1983). Awareness of both internal (e.g., personality traits, attitudes) and external (e.g., situational constraints) factors that govern an individual's behavior can facilitate interactions with that individual by providing insights regarding the person's behavior as well as the most effective means for interacting with him or her.

One type of bias associated with the attributional process—the correspondence bias—derives from Jones and Davis's (1965) correspondent inference theory, which describes the tendency of the social perceiver to infer a correspondence between an observed behavior and stable traits of the actor. Actors are assumed to make choices that are consistent with some desired outcome, and the theory assumes that the social perceiver draws dispositional inferences when the actor is perceived as having a choice in behavior. If the perceiver overattributes the actor's behavior to stable characteristics while underestimating the contribution of the context in which the behavior occurred (i.e., situational forces), then this once perfectly useful ability to draw a correspondent inference becomes problematic (Gilbert & Malone, 1995). This overreliance on correspondent inferences is sometimes referred to as the *fundamental attribution error* (Ross, 1977) when it violates the fundamental rule that observers should not infer that the actor is predisposed to behave in a certain manner when sufficiently strong facilitative forces are present in the environment. A classic example of this error was observed by Jones and Harris (1967). They found that young adults made attributions about an actor's attitude based on the content of a class essay written by the actor even when it was clear that the viewpoint expressed in the essay was selected by the instructor and not by the actor. In a subsequent experiment, Jones and Harris found that even having the experimental participants write an assigned (no-choice) essay themselves did not significantly attenuate their trait attributions for others who had performed the same kind of task.

Whereas the determinants of the correspondence bias are still open to debate (Gilbert & Malone, 1995), several factors that influence the strength of this bias and the related fundamental attribution error have been identified. For example, the degree to which the fundamental attribution error is evident in young adults is related to the perceiver's goals (e.g., Tetlock, 1985) and available cognitive resources (e.g., Gilbert & Krull, 1988).

Although there has been little emphasis on age-related variations in attributional processes in mainstream social psychological research (e.g., Gilbert & Malone, 1995; Sears, 1986), recent studies have demonstrated that causal attributions do not remain stable across adulthood (e.g., Blanchard-Fields, 1994; Blanchard-Fields & Norris, 1994; Chen & Blanchard-Fields, 2000; Graham & Weiner, 1986, 1991; Rankin, 2000). For example, Blanchard-Fields and her colleagues (Blanchard-Fields, 1994; Blanchard-Fields, Chen, Schocke, & Hertzog, 1998; Blanchard-Fields & Norris, 1994) have found that the correspondence bias increases in old age. They have also found, however, a concomitant age-related increase in the use of situational information in combination with dispositional information in explaining the causes of behaviors. Consistent with a growing body of research (e.g., Labouvie-Vief, Chiodo, Goguen, Diehl, & Orwoll, 1995; Soederberg Miller & Lachman, 2000), these studies also identify middle adulthood as a time of peak functioning in terms of the pragmatics of everyday life. Specifically, middle-aged adults not only exhibit a heightened tendency to make interactive attributions, but are also less likely than younger and older adults to exhibit a correspondence bias in their causal attributions.

Studies of aging have also begun to identify factors that may mediate such age effects, thereby providing potential clues as to the mechanisms underlying the correspondence bias. One such factor relates to cognitive complexity, which was identified as a potential mediating factor several decades ago (Bieri, 1961; Kelly, 1963). Generally speaking, cognitive complexity within an attribution setting refers to the degree to which one considers, for example, multiple determinants and causal explanations for behavior (Fletcher, Reeder, & Bull, 1990). Importantly, it appears that cognitive complexity varies with age in adulthood (e.g., Blanchard-Fields, 1994; Kramer & Woodruff, 1986; Labouvie-Vief et al., 1995), with increasing age being associated with "a better ability to differentiate an event from one's interpretation of it" (p. 211, Labouvie-Vief, 1992). Labouvie-Vief and colleagues (1995) examined representations of self in people 11 to 85 years of age. Higher forms of thinking about the self were found primarily in participants aged 46 to 59. Labouvie-Vief and colleagues also found that those aged 60 and older exhibited responses similar to adolescents, a phenomenon also observed by other aging-attributional researchers (i.e., Graham & Weiner, 1991; Blanchard-Fields & Norris, 1994). Research by Blanchard-Fields (1994; Blanchard-Fields & Norris, 1994) has also suggested that cognitive complexity factors account for some of the age-related variance in attribution responses.

Age-related declines in processing resources in older adults may also constrain the efficiency of complex social-cognitive operations (Hess, 1999). As noted before, the availability of cognitive resources is associated with the strength of the correspondence bias (Gilbert & Krull, 1988), and reduced cognitive resources have been implicated in elevated correspondence biases in old age (Chen & Blanchard-Fields, 1997). Reductions in resources in later adulthood may limit the extent to which individuals can rely on complex cognitive structures, perhaps accounting for these individuals' relatively high levels of attributional biases.

The present study sought to expand on the prior research

in the field, with two primary goals in mind. First, we wanted to examine the relationship between age and the fundamental attribution error in a different context than those used in previous research. Past studies have tended to rely on verbal descriptions of actors, about whom participants made attributions regarding the role of dispositional versus situational causes in determining their behavior. An important question concerns the extent to which similar age trends are obtained with different types of stimuli (e.g., real actors) using different types of judgments (e.g., attributions regarding attitudes). To address this issue, in the present study we used a modification of a procedure developed by Gilbert and Jones (1986). Young, middle-aged, and older adults watched videotapes of dyads in which one person, the *inducer*, asks questions regarding political attitudes and another person, the *responder*, answers these questions using alternative responses provided on cue cards. In the choice condition, participants were told that the responder would choose which of two alternative answers he would read in response to the question, whereas in the no-choice condition, participants were informed that the responder would be told which answer to read. After hearing the responder's answers in each condition, participants rated the degree to which the expressed and unexpressed responses were representative of the responder's true attitudes. In this situation, logic would suggest that alternatives chosen and read by the responder in the choice condition would be more representative than those selected by the inducer in the no-choice condition. Interestingly, however, Gilbert and Jones (1986) obtained evidence of the fundamental attribution error in the responses of younger adults. Specifically, much like the findings of Jones and Harris (1967), situational factors surrounding the responder's behavior did not influence attributions, with participants in the no-choice condition being just as likely as those in the choice condition to attribute the attitudes implied by the responses to the responder.

We sought to determine if such a pattern holds for middle-aged and older adults, as well. On the basis of the previous research, we expected that it would not hold and that middle-aged adults would be less likely than either young or older adults to exhibit the fundamental attribution error. That is, on the basis of anticipated variations in cognitive complexity and cognitive resources, we hypothesized that middle-aged adults would be more likely than younger and older adults to consider multiple causative factors surrounding the responder's behavior, and thus be more likely to take into account the context in which his behavior occurred. Thus, we predicted that they would be more likely to make attitude attributions in the choice than in the no-choice condition and that the difference in attribution strength between conditions would be greater than that observed for younger or older adults.

Our second goal was to identify factors related to the degree to which individuals exhibit a correspondence bias (Hicks, 1985) and to determine the extent to which such factors could account for age differences in performance. On the basis of the previously cited research, we obtained measures of cognitive complexity and attributional complexity to examine such relationships. To assess cognitive complexity, we used the Social Paradigm Belief Inventory (SPBI; Kramer, Kahl-

baugh, & Goldston, 1992) to identify an individual's preference for three different styles of thought: mechanistic, relativistic, and dialectical. It was anticipated that high levels of dialectical thought would be associated with a reduction of the fundamental attribution error because such thought emphasizes the integration of and dynamic interactions between the parts within a system. Consistent with the findings of Kramer and colleagues, it was also expected that dialectical thought would peak in middle-age and that this age-related variance in dialectical thinking would, in part, account for age differences in attributional responses.

We also assessed cognitive complexity using the Attributional Complexity Scale (ACS; Fletcher, Danilovics, Fernandez, Peterson, & Reeder, 1986). This scale assesses complexity factors specific to the attribution process, such as the degree to which the individual considers complex rather than simple explanations for behavior. Given these characteristics, we predicted that higher levels of attributional complexity would be associated with lower levels of the correspondence bias. Although evidence regarding age differences in attributional complexity is lacking, we anticipated that the pattern of performance would be consistent with findings regarding social-cognitive functioning and aging. Specifically, it was expected that attributional complexity would be associated with experience in the social world, and thus would increase with age. Consistent with research regarding cognitive complexity, we also hypothesized that attributional complexity would peak in middle age. Finally, we examined the extent to which variations in attributional complexity could account for age differences in attribution responses.

METHODS

Participants

Adults in three different age groups were tested. The young group consisted of 37 university undergraduates (17 women) drawn from the introductory psychology volunteer pool. Their mean age was 19.8 years (range = 18–29). The 37 middle-aged (19 women) and 37 older (17 women) participants were community volunteers who responded to an advertisement in a local newspaper. The mean age of the middle-aged group was 47.8 years (range = 36–59) and that of the older group was 69.8 years (range = 61–84). Student participants fulfilled a course option for their participation, whereas the other volunteers were paid \$10 for their participation. The three groups did not differ ($p = .28$) in self-assessed physical health (measured on a 5-point scale, 1 = excellent), but the two older groups had significantly more years of formal education than the young group did ($M_{\text{young}} = 13.38$, $M_{\text{middle-aged}} = 16.73$, $M_{\text{older}} = 16.06$), $F(2,108) = 24.26$, $p < .01$.

Design

The study used a 3×2 (Age Group \times Choice Condition) design, with choice condition being within-participants. Each participant observed two videotape recordings of two different individuals (i.e., responders) providing answers to a series of questions. In one condition, the responder was allowed to choose his response from the provided alternatives

(choice), whereas in the other he was told which response to read (no-choice). Following each video, participants made judgments about (a) whether a specific question had been asked of the responder, (b) which response was given by the responder, (c) the extent to which each of the provided responses reflected the responder's true beliefs, and (d) the responder's general political beliefs.

Materials

Video scripts.—Two scripts were constructed, each of which contained 11 questions about political views. Each of these questions had two alternatives, one representing a politically liberal viewpoint and one representing a politically conservative viewpoint. The question-answer (Q-A) sets used were created in a four-step process. First, 45 questions relating to contemporary political issues were composed by Katherine J. Follett. The two types of responses were generated for each question by individuals with either liberal or conservative credentials (e.g., a conservative group from Washington, DC). Second, these 45 Q-A sets were then evaluated for conservative and liberal content by 31 young adults using a 9-point Likert scale (1 = very liberal, 5 = can't tell, 9 = very conservative). Using the mean ratings on the political perspective scale as the criterion, 32 Q-A sets with clearly liberal and conservative responses were identified on the basis of cut-off points of less than or equal to 3 for liberal or greater than or equal to 7 for conservative. The responses for these Q-A sets were shortened to two or three sentences each.

Third, 22 judges representing all three age groups (14 young, 6 middle-age, and 2 older adults) then evaluated these 32 Q-A sets for political content and level of familiarity (measured on a 5-point scale, 1 = very familiar). Q-A sets had to have a mean familiarity rating of less than 3 to ensure that the represented political issues were generally familiar to most people. With respect to the political ratings, we decided that the median and mode ratings were most informative because of a very limited number of outliers that skewed the mean. To ensure that the responses in each Q-A set were consistently perceived as either conservative or liberal, we adopted mode and median cut-off points of less than or equal to 3 for the liberal response and greater than or equal to 7 for the conservative response. Finally, the 22 best Q-A sets that satisfied these criteria were used to make the final video scripts. Each script contained 11 of these questions, and questions were assigned so that each script would be similar in terms of overall content, issue familiarity, and extremity of political viewpoint expressed in the responses. A copy of each script was prepared, listing each of the 11 questions as well as the two associated responses. Sample Q-A sets are presented in Table 1.

Videos.—Videotapes were constructed to present the stimulus materials. In each videotape, an unseen 40-year-old woman played the inducer. This individual gave the responder instructions and read the questions to him. The responder was played by two different White men in their early 40s, who were instructed to respond with as much sincerity as possible (see Appendix). The camera was placed to

Table 1. Sample Question-Answer Sets

1. Should people who have grown children, or who are childless, or who send their children to private schools have to pay property taxes (school taxes)?	A. Yes. American children are the children of all the people, a valuable resource for our country. All people, especially the rich who can afford private schools, should be glad to help every child have a good education. (<i>Liberal Response</i>)
	B. No. Property taxes are the government's way of saying that we don't really own our property and the government does. No property owner should have to pay school taxes unless they are using the schools. People who use the schools should pay a use tax. (<i>Conservative Response</i>)
2. Should people have the right to burn flags?	A. The American flag symbolizes freedom. We are free to burn the flag as an expression of our freedom to protest. (<i>Liberal</i>)
	B. Many men have died protecting our flag. To destroy it is a repugnant act. There ought to be more respect for the flag. (<i>Conservative</i>)
3. Should affirmative action programs be abolished?	A. Women and other minorities are still being discriminated against. We need to support and expand affirmative action programs. (<i>Liberal</i>)
	B. Women and other minorities have ample opportunity to find jobs, work hard, and prove themselves. Management wants the best person for the job. There is no need to interfere in the job market. (<i>Conservative</i>)

Note: Response category was not seen by participants.

focus on the face and shoulders of the responder during taping. Although there were 11 questions in the script, only 8 were used in the video. For six of these questions—regardless of choice condition—the responder read responses that reflected the same political viewpoint (the majority perspective). These were called *dominant items*. For the other two questions, termed *crossover items*, the responder read the response representing the alternative political viewpoint (i.e., the minority perspective). The unused items in the script—henceforth referred to as *new items*—were ignored. The crossover items were included to help determine the extent to which participants' responses were based on what the responder actually said or on general information relating to the predominant response perspective.

At the beginning of each video segment, the responder, already seated, is thanked for volunteering and asked to read a list of questions that he is told will be used in the procedure. The video is then stopped while the responder presumably is given time to read the script. When the video resumes, the responder is told that the inducer is going to read 8 of the 11 questions in the list. In response to each question, the responder is instructed to read either the answer held up for him on a cue card (no-choice condition) or the better of the two answers displayed on cue cards (choice condition). For both conditions, the crossover items were interspersed among the dominant items, with the sequencing of these items being identical across conditions.

Eight different videotapes were constructed for use in the study, each of which contained two video segments, one corresponding to the choice condition and the other to the no-choice condition. To control for effects that were due to presentation order, content, and responder, we systematically counterbalanced segments. Thus, half of the participants viewed the no-choice condition first, and the other half the choice condition. In addition, the dominant perspective (liberal vs. conservative) adopted in each condition was systematically varied across participants, as was the identity of the responder across both conditions and perspectives. In general, the two videos seen by each participant varied in terms of the script used, the identity of the responder, and the majority perspective expressed. Given the complexity of these counterbalancing measures and the fact that the two scripts were carefully constructed to be similar in content characteristics, we decided not to systematically vary script across

choice conditions. Subsequent testing with an independent group of undergraduates indicated that the specific script used had no impact on performance, thereby reinforcing our decision.

Test materials.—In addition to instructions and copies of the video scripts, each participant's test package also included a set of test materials associated with each script. This set contained a list of the 11 Q-A sets contained in the script. For each of these sets, space was provided for the participant to indicate (a) whether the question had been asked; (b) if the question had been asked, which response was read by the responder, and if it had not been asked, which response would the responder have chosen if asked; and (c) to what degree each of the two responses reflect the responder's true attitude. These last two evaluations were made using a 9-point Likert scale (1 = very reflective, 5 = can't tell, 9 = not at all reflective). An item was also included at the end of each 11-question set to make a global assessment of that responder's political attitude using a 9-point scale (1 = liberal, 5 = can't tell, 9 = conservative).

Procedure

Participants were tested individually or in age-segregated groups of 2 to 4. On their arrival, they were seated at tables so that each person had a good view of a television with a VCR. The participants were told that they were taking part in a study of "memory for attitudes," and that

Sometimes when we see political speeches on TV, we are aware that the speaker is reading his or her answer. Nevertheless, we are called upon to decide if the speaker is sincere in what he/she is reading. A part of the decision process is remembering what was said and not said as well as being able to decide what other ideas a speaker might hold.

All participants received thorough instructions and were shown a sample answer sheet, which was reviewed with them by the examiner. Great care was taken to ensure that they understood the directions and that they were prepared for the first video in much the same way they were going to be prepared when they would respond in the second video.

Participants were informed that they would be watching two video segments and that

In one of the video segments, the responder will be *told* which of the two possible answers to read and in another video segment the volunteer will be allowed to *choose* which of the two possible answers he feels is the better answer.

Prior to each segment, instructions were presented to emphasize the specific context surrounding the responses read by the responder. The content, condition, and responder in each segment were counterbalanced as previously described.

Prior to watching the Q-A portion of each video, participants were given the appropriate script. Participants had 5 min while the tape was stopped to read over the script so that they would be familiar with the questions and answers being used in the video. Participants were then asked to watch the video segment and were instructed to “please listen carefully and do not take notes. At the end of each segment, the video will be stopped and you will be asked to answer questions about that segment.” At the end of each video segment, participants responded to the memory and attitude attribution questions associated with that script. Their test packets had one page for each Q-A set used in the video so they could see the question and both alternatives. The examiner read each question and the associated responses aloud. Participants were then given approximately 20 additional seconds to answer each of the four memory and attribution questions that followed. This was typically sufficient for most participants. When necessary, additional time was allotted to allow completion of a given item. This pacing procedure ensured that all participants began and finished each page together so that there was neither pressure to keep up nor time to reconsider initial responses. Following this, participants made a global assessment of the responder’s probable political orientation. When participants finished responding to the questions for the first video, they were given Vocabulary Test 2 (parts 1 and 2) from the Kit of Factor Referenced Cognitive Tests (Ekstrom, French, Harman, & Derman, 1976). Testing was resumed with the second video segment using the same procedure.

After viewing the two video segments, participants completed the 42 items on the SPBI (Kramer et al., 1992), which comprised the mechanistic, relativistic, and dialectical thinking subscales. Kramer and colleagues found that SPBI scores correlated well with other measures of complexity of thought and were minimally related to other personality characteristics or ability. Internal consistencies (i.e., Cronbach’s α) for the subscales used in this study were found to range from .60 to .84.

The ACS (Fletcher et al., 1986) was given next. This scale consisted of 28 Likert-type items ($\alpha = .85$) divided into seven 4-item subscales that assessed the following characteristics presumed to characterize the complexity of thought underlying an individual’s attributions: (a) level of motivation ($\alpha = .68$), (b) preference for complex explanations ($\alpha = .46$), (c) presence of metacognition concerning explanations ($\alpha = .63$), (d) awareness of social determinants of behavior ($\alpha = .52$), (e) tendency to infer complex internal

attributions ($\alpha = .39$), (f) tendency to infer contemporary complex external attributions ($\alpha = .51$), and (g) tendency to infer external causes from the past ($\alpha = .56$). Scores from this scale have been shown, for example, to predict the use of multiple and complex causes in making causal attributions (Fletcher et al., 1986).

RESULTS

For each analysis reported, an alpha level of .05 was adopted for individual tests of statistical significance. Initial analyses were conducted to examine the impact of the order of presentation of the choice conditions (choice first vs. no-choice first), the majority political perspective in each condition (liberal vs. conservative), and the actor depicting the responder in the video (Person A vs. B) on each dependent variable. In no case did these experimental control factors impact the effects of interest. Therefore, all reported analyses excluded these factors to simplify presentation. Responses to the item assessing self-reported political beliefs were also examined to determine if age differences in liberal versus conservative attitudes existed. Fortunately, the three age groups did not differ significantly on this item, reducing the possibility that age differences in political views would bias patterns of attribution ratings.

Item-Specific Attribution Responses

Attributions regarding the responder’s true attitudes were assessed using participant ratings for each response to each item. A 9-point scale was used for this purpose, with 1 indicating that the response was very reflective of the responder’s true attitude and 9 indicating it was not at all reflective. Gilbert and Jones (1986) used the raw scores from a similar scale in their analyses, assuming that ratings toward the “reflective” end of the scale for the response actually given would be indicative of attribution. Although reasonable on the surface, the use of raw ratings may not be the most sensitive measure of attribution. Specifically, although raw ratings that are consistent with the view espoused in the responder’s answer would normally be expected, it is possible that individuals may not always behave in such a manner, with ratings occasionally going in the opposite direction. Although seemingly illogical, this response pattern does reflect attribution as does any response that deviates from the midpoint (“can’t tell”) of the scale. That is, saying that something is not reflective of a person’s true attitude is making an attribution in the same way that saying something is reflective; both responses indicate the participant’s beliefs regarding the responder’s true attitudes.

In consideration of this, we adopted a more sensitive measure of attribution by subtracting each rating from the scale midpoint (i.e., 5) and then obtaining the average of the absolute values of these difference scores across all items for each participant within each choice condition. The resulting scores could range from 0 (no attribution) to 4 (strong attribution). These scores were then examined using a $3 \times 2 \times 3 \times 2$ (Age Group \times Choice Condition \times Item \times Response Type [majority vs. minority]) analysis of variance (ANOVA), with the last three variables within participants. Of primary interest were effects reflecting consideration of context in making attributions. A reduction in the corre-

spendence bias associated with such consideration would be reflected primarily in greater attribution ratings in the choice than in the no-choice condition. The use of contextual information in making attributions would also be reflected in participants providing greater attribution ratings for items actually presented in the video. Specifically, ratings should be greater for dominant and crossover items than for new items. In addition, ratings for the former two types of items should be greater for the response actually read by the responder (dominant: majority; crossover: minority) than for the unread response (dominant: minority; crossover: majority). If participants make these discriminations while also exhibiting a correspondence bias, it would seem reasonable to rule out poor recall of situational information as a potential explanatory factor for such a bias.

A significant effect due to age was obtained, $F(2,108) = 4.64$, $MSe = 7.51$, with older adults having significantly higher attribution ratings ($M = 2.01$) than either young ($M = 1.67$) or middle-aged ($M = 1.46$) adults. A significant effect was also obtained for condition, $F(1,108) = 4.10$, $MSe = 1.33$. This effect was due to participants being more willing to make attributions in the choice condition ($M = 1.78$) than in the no-choice condition ($M = 1.65$). Thus, information regarding the circumstances under which the responder was providing responses appeared to have an impact on willingness to infer attitudes. In spite of this difference between conditions, the mean attribution rating in the no-choice condition was still significantly greater than 0, $t(110) = 18.82$. In other words, participants were willing to make inferences about the responder's true attitudes even though there was some recognition of the constraints surrounding his responses.

The hypothesized interaction between age and condition (Table 2) was not reliable, $F(2,108) = 1.71$, $MSe = 1.33$, $p = .19$. Given our interests, however, we performed planned contrasts within each age group between conditions. There was no significant difference between attributions in the choice and no-choice conditions for either the young adults (1.69 vs. 1.65) or the older adults (2.03 vs. 1.98), $F_s < 1$, whereas this contrast just missed significance in the middle-aged group, $F(1,36) = 4.09$, $p = .051$. In this group, attribution was greater in the choice than in the no-choice condition (1.61 vs. 1.32). The variation across age

groups suggests that the previously described sensitivity to contextual information across conditions was primarily due to the responses of the middle-aged adults.

A significant effect of item was also obtained, $F(2,216) = 27.61$, $MSe = .53$, due to participants being more willing to make attributions for responses to items actually presented ($M_{\text{dominant}} = 1.85$; $M_{\text{crossover}} = 1.77$) than to unrepresented items ($M_{\text{new}} = 1.51$). Item also interacted with age, $F(4,216) = 5.05$, $MSe = .53$, reflecting a reduction in the consideration of contextual information in formulating responses for older adults relative to the other two age groups. Specifically, both young and middle-aged adults had significantly higher ratings for both types of presented items than for new items, whereas older adults had significantly higher ratings for dominant items than for crossover and new items (see Table 2). This may reflect an age-related problem in memory for inconsistent information (see below). Finally, item also interacted with response in determining ratings, $F(2,216) = 18.26$, $MSe = .22$. This effect reflected participants' greater willingness to make attribution for the response given than for the one not. Thus, for dominant items, ratings were higher for the majority response than for the minority response (1.96 vs. 1.76), whereas the direction was reversed for crossover items (1.70 vs. 1.87). Ratings did not vary by response for new items (1.52 vs. 1.49). This pattern of ratings suggests that participants were discriminating between responses that the responder did and did not give. The fact that age did not modify this effect suggests that differential memory for information in the video cannot easily account for the observed age differences in attribution bias.

Memory for Questions and Responses

Although some of the just-described effects provide indirect evidence that age differences in memory are not associated with age differences in attribution ratings, we decided to investigate this relationship more closely. Specifically, we determined whether the three age groups differed in memory for both the questions that were asked by the inducer and the responses provided by the responder. If age differences do exist, then the extent to which these age-related variations in memory affected between-group variation in attribution will need to be examined.

Question memory.—The proportion of questions correctly remembered as being asked (Table 3, top) was examined using a $3 \times 2 \times 3$ (Age Group \times Choice Condition \times Item Type) ANOVA. Younger adults correctly remembered more items (.92) than did either middle-aged (.87) or older (.86) adults, $F(2,108) = 3.15$, $MSe = .07$. Memory was also better for dominant (.90) and new (.92) items than for crossover items (.82), $F(2,216) = 14.72$, $MSe = .04$. The three-way interaction was also significant, $F(2,216) = 2.45$, $MSe = .03$. Further tests revealed that significant between-group variation was present only for crossover items in the no-choice condition, where younger adults (.95) remembered significantly more than both middle-aged (.73) and older adults (.84), who did not differ from each other ($p = .14$).

Response memory.—We next examined the proportion of responses correctly identified as given by the responder

Table 2. Mean Uncorrected Attribution Ratings by Choice Condition and Age Group

Item	Young		Middle-Age		Old		M All Ages
	M	SD	M	SD	M	SD	
Choice Condition							
Dominant	1.89	0.56	1.75	1.09	2.25	0.98	1.97
Crossover	1.85	0.74	1.66	1.07	1.92	0.94	1.81
New	1.34	0.58	1.42	1.00	1.92	1.05	1.56
M All items	1.69		1.61		2.03		
No-Choice Condition							
Dominant	1.70	0.58	1.35	1.10	2.15	1.03	1.73
Crossover	1.91	0.69	1.43	1.12	1.95	1.08	1.76
New	1.34	0.70	1.18	1.06	1.86	1.12	1.46
M All items	1.65		1.32		1.98		

Table 3. Mean Proportion of Presented Questions and Responses Correctly Remembered by Condition and Age Group

Condition and Item	Young		Middle-Age		Old		<i>M</i> All Ages
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Questions							
Choice Condition							
Dominant	.94	.08	.91	.12	.88	.13	.91
Crossover	.84	.27	.82	.27	.74	.33	.80
New	.93	.22	.93	.16	.88	.24	.91
No-Choice Condition							
Dominant	.91	.12	.88	.14	.90	.12	.89
Crossover	.95	.16	.73	.33	.84	.29	.84
New	.95	.17	.95	.12	.90	.21	.93
Responses ^a							
Choice Condition							
Dominant	.96	.16	.96	.10	.88	.25	.93
Crossover	.94	.23	.99	.08	.71	.43	.88
No-Choice Condition							
Dominant	.93	.15	.95	.14	.85	.25	.91
Crossover	.96	.14	.91	.29	.93	.25	.93

^aYoung: *n* = 36; Middle-aged: *n* = 33; Old: *n* = 32.

for those questions actually asked (i.e., dominant and crossover items). Because identification of a correct response is contingent on correct recognition of the question asked, memory scores were calculated using only responses to those questions that the participant correctly recognized as being asked. This resulted in the elimination of 1 young adult, 4 middle-aged adults, and 5 older adults from the analysis because of missing data in specific cells.

Memory scores for the remaining participants (Table 3, bottom) were compared using a 3 × 2 × 2 (Age Group × Choice Condition × Item) ANOVA. Once again, the young (.96) and middle-aged (.96) adults remembered more than the older adults did (.84), $F(2,98) = 6.30$, $MSe = .10$. Several significant interactions were also observed: Age × Condition, $F(2,98) = 6.67$, $MSe = .03$, Condition × Item, $F(1,98) = 4.67$, $MSe = .03$, and Age × Condition × Item, $F(2,98) = 7.10$, $MSe = .03$. Decomposition of this last interaction revealed no significant effects for either the young or the middle-aged adults ($ps > .07$). In contrast, the main effect of condition, $F(1,31) = 6.41$, $MSe = .05$, and the Condition × Item interaction, $F(1,36) = 15.25$, $MSe = .05$, were significant for the older adults. These effects were due to memory for crossover responses in the choice condition being significantly lower than memory for the other three types of items.

In summary, participants had fairly good memory for the questions asked by the inducer ($M = .88$) as well as for the responses provided by the responder ($M = .92$). Older adults did, however, have poorer memory for both types of information than did both young and middle-aged adults. In addition, older adults and, to a lesser extent, middle-aged adults had particular problems remembering information about crossover items. That is, they were less likely than young adults to recall questions associated with cross-

over responses as being asked and more likely to falsely attribute the majority response associated with such items to the responder. These age-related memory effects are consistent with previous research demonstrating that aging has a disproportionate impact on memory for inconsistencies (Hess, 1990). Given the obtained age effects, we repeated the analyses examining attribution ratings while controlling for memory for specific content information.

Corrected Item-Specific Attribution Responses

Mean attribution ratings were recalculated using only responses to those items for which the participant accurately remembered both the question and—in the case of dominant and crossover items—the response given. (For new items, no response was given by the responder.) This resulted in the exclusion of 4 younger adults, 7 middle-aged adults, and 13 older adults because of missing data in one or more cells. There were no obvious differences in the characteristics of those participants whose data were excluded when compared with the remaining participants. Thus, this reduced sample was considered similar in nature to the full sample, and we proceeded to analyze the corrected scores (Table 4) in the same way as the uncorrected scores.

The results of this analysis were similar to those obtained using the uncorrected scores, with two notable exceptions. First, the Age × Condition interaction was now significant, $F(2,84) = 3.33$, $MSe = 1.32$. This latter effect reflected the strengthening of the trend noted in the previous analysis, whereby middle-aged adults made significantly higher attribution ratings in the choice than in the no-choice condition (1.53 vs. 1.13), whereas young (1.70 vs. 1.67) and older adults (2.02 vs. 2.03) did not distinguish between the two. This analysis also revealed a significant Condition × Item interaction, $F(2,168) = 6.41$, $MSe = .45$. This was due to ratings being significantly greater in the choice than in the no-choice condition for dominant items (1.94 vs. 1.64) and new items (1.50 vs. 1.31), but not for crossover items (1.74 vs. 1.79).

In sum, consistent with our expectations, middle-aged adults were more sensitive to contextual information (e.g., the responder's freedom in choosing responses) than were adults in the other two age groups when making attribu-

Table 4. Mean Corrected Attribution Ratings by Choice Condition and Age Group

Item	Young (<i>N</i> = 33)		Middle-Age (<i>N</i> = 30)		Old (<i>N</i> = 24)		<i>M</i> All Ages
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Choice Condition							
Dominant	1.92	.58	1.66	1.08	2.30	1.01	1.94
Crossover	1.90	.82	1.52	1.03	1.81	1.06	1.74
New	1.25	.75	1.40	1.01	1.95	1.06	1.50
<i>M</i> All items	1.70		1.53		2.02		
No-Choice Condition							
Dominant	1.70	.59	1.21	.97	2.11	1.03	1.64
Crossover	2.04	.70	1.20	.96	2.19	.92	1.79
New	1.27	.70	.97	.95	1.77	1.09	1.31
<i>M</i> All items	1.67		1.13		2.03		

tions, especially when memory for specific responses made by the responder was taken into account. Middle-aged adults were also more likely than older adults to differentiate between attitudes actually expressed by the responder versus unexpressed attitudes, further suggesting somewhat greater contextual sensitivity in midlife.

Global Attribution Ratings

We next examined participants' global ratings regarding the responder's political attitudes. Deviation scores in each condition were calculated as before, and they were examined using a 3 × 2 (Age Group × Choice Condition) ANOVA. The only effect obtained was a significant Age × Condition interaction, $F(2,108) = 3.44$, $MSe = .89$. Contrasts within age groups revealed that middle-aged adults were once again more sensitive than participants in the other age groups to contextual factors in assigning ratings. Specifically, ratings were significantly higher in the choice than in the no-choice condition for the middle-aged adults (1.76 vs. 1.24), but not for the young (1.77 vs. 1.64) or the older (1.60 vs. 1.89) adults.

Cognitive Complexity Effects

Our final set of analyses examined the relationship between cognitive complexity and attribution bias. We tested the general hypothesis that higher levels of complexity would be associated with increased attention to contextual factors surrounding the responder's behavior, resulting in lower levels of bias. As a first step, correlations were obtained between measures of attribution bias and the subscale scores from both the SPBI and the ACS. In the first case, two different summary scores were created for both the item-specific responses and the global ratings. The first was a simple difference score in which the mean attribution rating in the no-choice condition was subtracted from that of the choice condition. The second was a proportional score that attempted to correct for variations in overall attribution ratings. Specifically, the mean attribution rating in the choice condition was divided by the sum of the ratings in both the choice and no-choice conditions. For both measures, higher scores reflected less attribution bias (i.e., greater willingness to make attribution in the choice than in the no-choice condition).

As can be seen in Table 5, relations between the bias scores and complexity measures were not particularly strong, although a few significant relationships did emerge. Specifically, significant positive correlations were observed between the various attribution bias indexes and the SPBI Dialectical scale and the Preference for Complex Explanations (PCE) and Motivation subscale of the ACS. This suggests that those individuals who exhibit higher levels of dialectical thought, apply complex causal schemas (e.g., search for multiple causal mechanisms) to understanding behavior, and possess higher levels of intrinsic motivation to explain the behaviors of other people were less likely to exhibit the fundamental attribution error than were individuals who did not possess these characteristics. Although not statistically reliable, several other correlations were in the expected direction (e.g., mechanistic thinking was associated with greater correspondence bias, whereas a tendency to infer contemporary complex external attributions was associated with less bias).

Table 5. Correlations Between Attribution Ratings and SPBI and ACS Subscale Scores

Subscale	Item-Specific Ratings		Global Ratings	
	Difference	Proportion	Difference	Proportion
SPBI				
Mechanistic	-.02	-.03	-.13	-.14
Relativistic	.10	.15	-.01	.05
Dialectical	.26**	.30**	.10	.04
ACS				
Motivation	.09	.16	.18	.20*
Preference for Complex Explanation	.24**	.34***	.24**	.24**
Metacognition	.06	.11	-.14	-.18
Social Determinants Behavior	.12	.11	-.02	.03
Complex Internal Attributions	.03	.11	.00	-.03
Complex External Attributions	.15	.16	.16	.12
Past External Causes	.02	.11	.03	-.01

Notes: SPBI = Social Paradigm Belief Inventory; ACS = Attributional Complexity Scale.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Stepwise regressions using all the SPBI and ACS subscales as predictors revealed significant amounts of variance accounted for by each of the four attribution measures. For item-specific ratings, SPBI Dialectic and ACS PCE accounted for 13% of the difference score variance, $F(2,108) = 8.19$, $p < .001$, and 21% of the proportion score variance, $F(2,108) = 14.56$, $p < .001$. For global ratings, the ACS PCE and Metacognition subscales accounted for 12% of the difference score variance, $F(2,108) = 7.58$, $p = .001$, whereas these same two subscales plus the ACS Motivation subscale accounted for 19% of the proportion score variance, $F(3,107) = 8.14$, $p < .001$.

The second set of analyses examined age-related variations on the SPBI and ACS subscales, and the extent to which such variations could account for the observed age effects in attribution. Univariate analyses for each subscale indicated that age-group effects were only present for the SPBI Relativism score, $F(2,108) = 6.37$, $MSe = 61.05$. Thus, contrary to expectations, cognitive complexity was not clearly associated with age, at least as indexed at the group level. For each of the four attribution measures, we then conducted a series of hierarchical regression analyses to examine the extent to which the previously described effects of complexity on attribution ratings could account for age-group-related variance in these ratings. For item-specific attributions, the SPBI Dialectical and ACS PCE subscales only accounted for 3% and 14% of the age-related variance in the difference and proportion scores, respectively. For global attributions, the ACS PCE and Metacognition subscales accounted for 35% of the age-related variance for difference scores, whereas these two subscales plus the Motivation subscale accounted for 32% of the age-related variance in proportion scores.

To summarize, a relationship was observed between cognitive complexity and strength of the correspondence bias, with the nature of the effects being generally consistent with expectations. Somewhat surprisingly, however, minimal systematic variation in complexity was observed as a func-

tion of age, although complexity did account for up to one third of the age-related variance in attribution bias.

DISCUSSION

The present study examined age differences in attribution, with two primary aims. Specifically, we wanted to both examine whether age differences existed in the prevalence of the fundamental attribution error and determine the extent to which such differences could be accounted for by variations in the complexity of cognitive operations thought to support the construction of attribution judgments. The results are relatively straightforward.

First, middle-aged adults were less likely to make the fundamental attribution error than either young or older adults were. Specifically, the middle-aged participants were less likely to attribute specific political viewpoints to the responder when his stated views were determined by another than when they were selected by himself. Younger and older adults made higher attribution ratings overall than middle-aged adults, and they did not discriminate between choice conditions. This indicates that situational factors surrounding the responder's behavior were not considered in making attributions by participants in either of these groups. Importantly, these age differences were evident for both item-specific and global attribution ratings. Note that although the middle-aged group demonstrated a reduced tendency toward the fundamental attribution error relative to the other two age groups, their responses were not immune to this error. Specifically, their attribution ratings in the no-choice presentation condition were significantly greater than 0. Thus, middle-aged adults were still willing to attribute specific attitudes to the responder even when he gave no information about his true attitudes. This illustrates the strength of this attributional bias throughout adulthood.

The observed age effects in judgments are noteworthy in that the present study examined attribution using a somewhat more ecologically valid testing context than that used in previous studies. Specifically, participants viewed videotapes of real people rather than reading descriptions, and they made inferences regarding attitudes rather than more abstract judgments regarding the causal mechanisms underlying behavior. In spite of these differences in methods, the observed age effects are consistent with those obtained in previous research, reinforcing the reliability of this effect across contexts.

Our other major goal in this research was to identify factors that might explain the observed age effects in attribution responses. The primary factor of interest in the present study concerned age-related variation in the complexity of thought hypothesized to undergird the attributional process. Consistent with expectations, measures from the SPBI and ACS were found to be associated with attributional bias. For example, higher levels of dialectical thought, preference for complex rather than simple explanations for attributions, and higher intrinsic motivation to explain the behaviors of others were all found to be associated with lower levels of the fundamental attribution error. Thus, individuals who look for multiple causes of events are less likely to exhibit attributional biases, presumably because they take into account situational as well as dispositional factors in making

behavioral inferences. These results relating to the motivational component of attributional complexity are consistent with those obtained in studies using only young participants (e.g., Webster, 1993). In addition, the relationships between complexity and attribution were generally more consistent for measures obtained from the ACS than for those from the SPBI. This may reflect the fact that the ACS assesses complexity of thought relative to the attribution process, whereas the SPBI provides a more general assessment.

Evidence was also obtained that age differences in complexity of thought partially mediate the observed age-related variation in the strength of the fundamental attribution error. The degree of mediation, however, was at best moderate, with measures from both complexity scales accounting for no more than 35% of the age-related variance on a given index of attributional bias. One obvious reason for the lack of strong mediation effects is the failure to observe reliable differences in complexity across age groups. Inconsistent with expectations, mean levels of cognitive and attributional complexity were relatively stable across groups rather than increasing with age and peaking in midlife. Although mean performance did not change appreciably, an age-related increase in variability in performance was evident on each of the SPBI subscales and on six of the seven ACS subscales. This variability in turn may have also reduced the power of our analyses to identify age-related mediation effects. For example, both the mean and standard deviation as well as the high within-group score for the SPBI Dialectical scale were greatest in the older adult group (young: $M = 56.2$, $SD = 4.4$; high score = 66; middle-aged: $M = 56.1$, $SD = 6.1$; high score = 73; older: $M = 58.6$, $SD = 7.3$; high score = 74).

Interestingly, the greater variability in complexity with age appeared to increase its predictive power when the previously described stepwise prediction procedures were performed within age groups. Specifically, none of the complexity subscale scores were significant predictors of any of the four measures of attributional bias in the young group. In the middle-aged group, predictor sets accounted for 13% to 36% of the variance across measures, whereas in the older group 16% to 38% of the variance was accounted for. Thus, complexity was clearly an important factor in determining the degree to which individuals exhibited the fundamental attribution error. What is unclear is why age differences in attributional bias were observed in spite of the absence of significant group-related differences in complexity of thought.

It is possible that other cognitively based factors, such as the availability of cognitive resources, may have had a role in determining the observed age effects. For example, age differences in attribution judgments might reflect variations in memory-related factors. Older adults in particular might have problems remembering what was said in the videotapes, potentially complicating inferences about attitudes. Although age was indeed related to memory for both questions asked and responses given, controlling for this variation actually strengthened the age effects rather than eliminated them. Note also that memory for what was said is not a good predictor of attribution bias in and of itself given that the group with the best memory (i.e., young adults) had a strong tendency toward the fundamental attribution error. In

a related vein, it is also possible that the age differences in attribution were related to memory for situational information concerning the circumstances surrounding the responder's behavior. Unfortunately, we did not explicitly examine memory for such information (e.g., whether the responder was choosing or being told what to say), so this possibility cannot be excluded. Note, however, that the choice versus non-choice aspect of the task was repeatedly emphasized during the course of the study, and participants appeared to understand the distinction.

Cognitive resources may have also influenced performance by interacting with task demands. Participants were paced through the ratings part of the procedure, with about 20 s allowed for answering two questions and making two ratings for each of 11 items. Although this response rate did not appear to present any specific difficulties to study participants, the externally paced nature of the task coupled with its complexity may have placed heavy demands on cognitive resources, which in turn may have reduced the tendency of participants to consider situational factors and to make appropriate attributional adjustments (e.g., Gilbert et al., 1988). Such task demands may have a disproportionate impact in later adulthood, when cognitive resource reductions might not only limit performance but also affect the motivation to engage resources (Hess, 1999; Hess, Rosenberg, & Waters, 2001).

In support of such an assertion, Chen and Blanchard-Fields (1997) found that the nature of age differences in dispositional judgments was related to the time allocated to making a judgment. When given extra time to think about their answers, older participants reduced their dispositional attributions, suggesting a correction for situational information. Similarly, Rankin (2000) examined attributions using a mail survey, which allowed participants ample time to ponder their attributions. Her results showed that older participants were more situational and less dispositional in their assessments than younger participants were. Thus, the differences observed between the middle-aged and older adults in the present study may simply reflect the older group's need for more time to adjust initial impressions. In other words, the effort necessary to both remember which alternative answer was used and make judgments about the sincerity of the responder—in combination with the time constraints of the task—may have prevented the older participants from engaging sufficiently in the correction part of the process. This, in turn, may have reduced the power of our analyses to examine the role of cognitive complexity in determining age differences in performance. For example, Fletcher and colleagues (1990) found that attributionally complex participants were less apt to make the fundamental attribution error than were attributionally simple participants, but only when elaborate and in-depth processing of the stimulus material was encouraged.

Note, however, that the pace with which participants proceeded through the present task—and thus the demands placed on cognitive resources—should not necessarily lead to an increase in the fundamental attribution error. Specifically, if participants were using situational information in constructing attributions, they would not need to remember—or indeed even read—the response alternatives in the

no-choice condition. All the information that would be necessary would be the knowledge that the responder was instructed as to what to say rather than being allowed to choose. Given such information, the most reasonable conclusion is to infer that we can say nothing about his true attitudes regardless of the content of the responses. Thus, if task demands do account for the attributional bias observed in the older adults, it may have to do with the negative impact of reduced cognitive resources on the ability to maintain relevant task information in working memory while engaging in another task (i.e., making memory judgments). Although the external pacing of the task may exacerbate this effect, it does not seem sufficient to account for the older adults' performance.

Although age-related limitations in cognitive resources may help account for the high levels of bias observed in the older adults' attribution responses, such factors should be less likely to explain the performance of the younger adults, who presumably have ample resources available to deal with the complexity of the task. Given the pervasiveness of attributional bias in younger adults both in aging studies (e.g., Blanchard-Fields, 1994) and in mainstream social psychological research (see Gilbert & Malone, 1995), their responses may reflect aspects of social information processing that are unrelated to resources. Gilbert and Malone (1995) suggested that young adults may not adjust attributions to take situational information into account because of, for example, their failure to recognize that correction is needed or their lack of knowledge regarding the impact of the situation on behavior. These factors might be related to experience in the social world, which is obviously related to age and which may influence attributions independently of cognitive complexity. One may be inclined to consider multiple factors in making attributions and have the resources for doing so, but if one is unaware of what factors to consider, biased attribution may still be the result.

On the basis of our findings and those of previous studies, a tentative explanation for the observed age effects in our study can be provided. Specifically, cognitive complexity is likely an important factor accounting for age-related variability in attributional bias. Although systematic age trends in complexity were not obtained, there was evidence that age was associated with greater variability in the complexity of thought. In fact, it could be argued that the age-related increase in the variability of complexity scores allowed for the significant relationship between complexity and attribution to emerge for the sample as a whole. Whereas this variability limited the usefulness of a complexity-based mediational model of age effects at the individual participant level, the reduction in group-based measures of the fundamental attribution error from young to middle adulthood may reflect an increase in the number of individuals exhibiting high levels of complexity. This observation is consistent with the increased variability in attribution responses observed in the middle-aged group relative to that in the young group (see Table 2). Although greater variability in complexity was also observed in the older group, it may be that age-related reductions in cognitive resources limited the impact of complexity on performance. Performance consistent with observed levels of cognitive complexity may be less evident in

later life when task demands are great (Chen & Blanchard-Fields, 1997; Fletcher et al., 1990). Conceivably, if the time pressure and task complexity associated with our testing procedure were reduced, performance in the older adult group would be similar to that in the middle-aged group. Note, however, that although the nature of the present task may have limited older adults' ability to exhibit their competence in making attributional judgments, it may also have provided a reasonable picture of what would happen in everyday life when such judgments are made in "real-time" in the context of other ongoing activities. Future systematic examination of these factors should provide a more complete understanding of age differences in attribution processes.

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Appendix*Note*

1. A concern could be raised that the age of the responder in the video might interact with the age of the participant in determining attribution ratings, with the middle-aged adults in the study being less likely to make dispositional attributions than were young and older adults because of the similarity in age between the target and

themselves. At least two arguments can be made against this. First, the research literature is replete with studies demonstrating that participants exhibit the fundamental attribution error when making judgments about the behaviors of similarly aged others. Second, reports of participants in our study indicated little consistency in the age attributed to the responder, with judgments ranging from the middle 20s to middle 40s. This lack of consistency would preclude systematic effects based on similarity.