Source Memory and Appearance-Based Bias in Older Adults

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by
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Abstract

Earlier research on the influence of babyfaceness on source memory indicates this facial characteristic may lead to source memory bias in younger adults. Data suggests the neonatal features of babyfaceness illicit first impressions of social submissiveness, physical weakness and a lack of cleverness. A previous study of source memory bias and babyfaceness collected data from an exclusively young adult sample, thus little is known about the influence of babyfaceness of the source memory of older adults. Repeating the earlier study of younger adults using the same procedure and stimuli, this experiment attempts to extend our knowledge of this phenomena to a more diverse population. We will expose older adults to pictures of mature-faced and babyfaced individuals paired with either a submissive or dominant sentence (some congruently, i.e. babyfaced individual/submissive sentence; some incongruently, i.e. babyfaced individual/dominant sentence). Later, we will test them for their memory of these pairings. We predict that older adults may experience bias in one of two ways, depending upon which cognitive mechanism has a stronger influence on memory. If older adults rely most strongly on trait-diagnostic information rather than stereotypes and schematic knowledge when forming impressions, their memory for incongruent behaviors of baby-faced or mature-faced individuals will be better than that of younger adults. Alternatively, because executive functioning declines with age, we may see older adults relying more heavily on schematic knowledge and stereotypes to make decisions about baby-faced or mature-faced individuals. Should this be the case, we would expect to see that older adults' memory for incongruent behaviors of baby-faced or mature-faced individuals would be worse than that of younger adults.

Source Memory and Appearance-Based Bias in Older Adults

Humans form first impressions very quickly upon encountering someone new. In fact, people form impressions of new people within the first 100 milliseconds of meeting them (Willis & Todorov, 2006). While from a cursory glance at a human face we can glean the rough age, gender, and emotional state of that person (Kramer, Zebrowitz, San Giovanni, & Sherak, 1995). It is impossible to derive an comprehensive assessment of more significant traits (e.g., one's integrity, intelligence or even aggressiveness) from a mere glimpse (Carré, McCormick, & Mondloch, 2009).This rapid use of facial cues may be evolutionarily adaptive (e.g. seeing the anger or aggression on someone's face as they are approaching, rather than after they have hit you), evidenced by our reliance on adaptively significant cues to form facial impressions (L. A. Zebrowitz, Fellous, Mignault, & Andreoletti, 2003). Perceivers spontaneously characterize certain facial features, such as having large eyes and round faces (Berry & McArthur, 1986), as indicating physical weakness, social submissiveness, and a lack of intellect or cleverness (McArthur & Apatow, 1984); (Montepare & Zebrowitz, 1998) These assessments correspond with high degrees of a quality known as "babyfaceness," or the extent to which one has child-like facial features.

Researchers have explored the impacts of babyfaceness in social situations. Mature-faced individuals generally enjoy more success in politics, military rank, careers, and judicial proceedings involving crimes of negligent action (Mueller & Mazur, 1996); (Collins & Zebrowitz, 1995); (L. Zebrowitz & McDonald, 1991) compared to those who are babyfaced. Baby-faced individuals, however, seem to fare better than their mature-faced counterparts in

judicial proceedings involving crimes of intent – when babyface people deny guilt, they are believed more if it is an intentional crime (L. Zebrowitz & McDonald, 1991). Thus, appearance-based inferences of the extent to which one has babyfaced features categorizes those with more mature faces as being more dominant and capable, while those with more babyfaced features are perceived as submissive and vulnerable. A recent study investigates the effects of these appearance-based inferences from babyfaceness further, considering its role potentially biasing source memory (Cassidy, Zebrowitz, & Gutchess, 2012), suggesting that one's babyfaceness can also play a role in how people remember other people's behaviors.

Biases in memory have been described as the effect of current information, beliefs and emotions on the remembrance of previous experiences (Schacter, 1999). Source memory errors may occur when beliefs or expectations interfere with accurate recall of the source of previously learned information. For example, if two people of unequal facial maturity are competing for a job promotion, the more mature-faced person may receive the advancement; his or her facial appearance could be taken as an indicator for potential leadership. This is because it is easier to remember a mature-faced person performing a dominant or leadership-related behavior. Source memory errors may result from well-explored cultural biases in areas including gender and race (Banaji & Greenwald, 1995). One study introduced participants to set of male and female names, both famous and nonfamous. When these participants recalled the names in a later task, they were more likely to mistake a nonfamous male name for a famous one than a nonfamous female name because it is easier to associate men with success and fame (Banaji & Greenwald, 1995).

Some research indicates that appearance-based inferences may bias social decisions and first impressions. One recent study revealed that stereotypical African American faces were more

often associated with crime and violence, both in instances when participants correctly identified criminals and when the participants' memories failed (Kleider, Cavrak, & Knuycky, 2012). Moreover, first impressions are less accurate when participants rely on facial cues than when they use other types of concrete knowledge (e.g. individual's behavior) to inform their impression (Olivola & Todorov, 2010). Participants in another study of source memory errors more often paired reasonable and positive newspaper headlines with a trustworthy-looking source, while less believable and negative headlines were remembered as coming from an untrustworthy-looking source (Nash, Bryer, & Schlaghecken, 2010). In some circumstances, however, individuals may remember sources when appearance-based inferences are incongruent with later-revealed personality traits. For example, source memory improves for trustworthy-looking cheaters (surprising and dangerous) as compared with untrustworthy-looking leaders (surprising and innocuous), suggesting that we are more attentive to inconsistent information when the outcome is potentially harmful (Suzuki & Suga, 2010).

A recent experiment explored appearance-based source memory bias by exposing participants to photographs of babyfaced and mature-faced individuals paired with behavioral sentences (Cassidy et al., 2012). Each face was paired with either a dominant (e.g., "When the compass broke, he led the group north") or submissive (e.g., "He asked everyone which movie they wanted to see") behavioral sentence, which could be appearance-congruent (i.e., mature-faced individuals with dominant behaviors; baby-faced individuals with submissive behaviors) or appearance-incongruent (i.e., mature-faced individuals with submissive behaviors; baby-faced individuals with dominant behaviors). Participants then completed a source memory task, where they were asked to recall which of two faces (one correct target, and one incorrect lure) was

more dominant or more submissive, based on previous learning of the individual's behaviors. The lure's facial characteristics either matched (e.g., babyfaced target, babyfaced lure) or differed from the target face (e.g., babyfaced target, mature-faced lure). When the lure and target faces differed in their facial characteristics, and the target was originally paired with an appearance-incongruent behavior, participants had more source memory errors than for targets originally paired with appearance-congruent behaviors. Because these errors would primarily occur when the facial characteristics of the lure matched the retrieval prompt (e.g., mature-faced lure with a retrieval prompt of "Who is more dominant?"), these memory errors may have been a result of lure facial characteristics being used as source decision cues.

At present, it is unclear whether age-related changes increase or decrease appearance-based source memory bias in older adults. Source memory deficits may become more pronounced, as cognitive processes decline with age (Trott, Friedman, Ritter, & Fabiani, 1997). Older adults thus may exhibit source memory biases stemming from appearance-based inferences that differ from younger adults. Older adults may rely on more schematic knowledge (knowledge based on preconceived conceptions) or trait-diagnostic information (gleaning an understanding of an individual from an his or her traits) to compensate for declining memory (Mather & Johnson, 2003) ; (Shi, Tang, & Liu, 2012); (Radvansky, Lynchard, & von Hippel, 2009); (Hess & Tate, 1991); (Hess & Auman, 2001). Reliance on schematic knowledge works similarly to stereotypes and may contribute to enhanced source memory bias based on appearance-based inferences relative to younger adults. Though older adults may attempt to suppress their tendency to rely heavily on schematic knowledge because it contributes to prejudice and is often inaccurate, it is a difficult mechanism to overpower ((Mather & Johnson,

2003); (Shi et al., 2012); (Radvansky et al., 2009); (Hess & Tate, 1991)). Older adults may still experience an increase in appearance-based inferences because schematic knowledge and trait-diagnostic information may introduce the overuse of appearance-based stereotypes ((Macrae, Bodenhausen, Schloerscheidt, & Milne, 1999); (Miyake, Friedman, Emerson, Witzki, & Howerter, 2000); (Krendl, Heatherton, & Kensigner, 2009); (Buckner, 2004)). On the other hand, there is evidence suggesting that older adults are not always misled by schematic knowledge because they may instead rely on trait-diagnostic information when making trait attributions ((Hess & Auman, 2001); (Hess & Tate, 1991)). This is because the use of trait-diagnostic information relies on specific characteristics or attributes to derive a first impression, rather than assumptions based on ingrained stereotypes. Older adults may be more likely to use trait-diagnostic information if they have been trained overtime to notice or attend more to information that is inconsistent or surprising.

To explore the connection between appearance-based impressions and source memory bias in older adults, we will test older adults' source memory for baby-faced and mature-faced individuals encoded with behavioral sentences that are appearance-congruent or appearance-incongruent. We predict that older adults may experience more or less appearance-based bias than younger adults, depending upon which cognitive mechanism has a stronger influence on memory. If older adults rely more on trait-diagnostic information than stereotypes and schematic knowledge when forming impressions, their memory for incongruent behaviors of baby-faced or mature-faced individuals will be better than that of younger adults. This is because they will focus on the diagnostic information and form impressions that are based in fact, rather than stereotypes. Alternatively, we may see older adults relying more heavily on schematic knowledge

and stereotypes to make decisions about baby-faced or mature-faced individuals because their memory for trait-diagnostic information may be poorer than that of younger adults. Should this be the case, we would expect to see that older adults' memory for incongruent behaviors of baby-faced or mature-faced individuals would be worse than that of younger adults.

Another factor to consider is the influence of own-age bias in memory for first impressions. Own-age bias is a phenomenon in which one remembers individuals of their own age group better than individuals of another age group (Anastasi & Rhodes, 2005). A recent study on source memory suggests own-age bias may influence one's ability to remember faces based on how similar those faces are to the individual (Cassidy et al., 2012). The experiment revealed an own-age bias in source memory, such that younger adults had better memory for younger over older faces. If older adults similarly exhibit an own-age bias in source memory, we predict older adults may have an easier time remembering older faces. However, some research indicates that older adults may not exhibit own-age biases in source memory because they have experience with both younger and older age groups (Havard & Memon, 2009). If this is the case, we predict that older adults will do equally well at remembering their first impressions older and younger faces based on their behaviors.

Method

Participants

Twenty-four older adults (66 to 86 years old, 12 males; $M = 76.96$, $SD = 6.29$) from the Boston area were recruited from a volunteer database of participants. We also used data from a

previous study of twenty-four younger adults (18 to 22 years old, 14 males; $M = 19.13$, $SD = 1.06$) recruited from Brandeis University (Cassidy et al., 2012). Older adults' MMSE scores (Folstein, Folstein, & McHugh, 1975) were > 27 ($M = 29.33$, $SD = 1.05$). Older adults ($M = 16.40$, $SD = 2.63$) differed from younger adults ($M = 12.90$, $SD = 1.09$) in years of education, $t(46) = 6.01$, $p < 0.001$. The vocabulary scores (Shipley, 1986) of older ($M = 37.67$, $SD = 4.06$) adults were significantly higher than those of younger ($M = 29.63$, $SD = 10.52$) adults, $t(46) = 3.50$, $p = 0.001$. Using the digit-comparison task (Hedden et al., 2002) as a measure of processing speed, younger adults showed a higher average speed ($M = 78.50$, $SD = 11.00$) than older adults ($M = 68.75$, $SD = 11.04$), $t(46) = 3.064$, $p = .004$. Younger adults also had higher scores on the letter-number sequencing task (Wechsler, 1997), a measure of executive function, ($M = 12.00$, $SD = 2.23$) as compared to the older adults ($M = 10.17$, $SD = 1.61$), $t(46) = 3.27$, $p = .002$. All participants received and signed an informed consent before the experiment began, and the protocol was approved by the Brandeis University Institutional Review Board.

Stimuli

The stimuli used were from in an earlier study investigating impression formation of babyfaced and mature-faced individuals (Cassidy et al., 2012). Cassidy and colleagues' paper (2012) provides a more detailed description of the selection procedure for the stimuli.

Faces. Using the PAL database, (Minnear & Park, 2004) 64 pictures of babyfaced and mature-faced individuals with neutral expressions were selected based on the ratings of younger and older adults. Half (32) of the images are of younger adults (18-29 years old) and half of older individuals (70-94 years old), and are split equally among male and female faces. For each age-

gender group, babyfaced and mature-faced individuals differ on ratings of babyfaceness, but not of attractiveness. Among all of the faces used, one-quarter (16) of the faces were female younger adults, one-quarter were male younger adults, one-quarter were female older adult and the final quarter were male older adults.

Sentences. Sixty-four different sentences were selected for the final dataset based on dominance ratings by younger and older adults, and were split equally among positive and negative valence. Forty-nine of the sentences are experimenter-generated, while 15 were selected from a database often used for impression formation experiments (Uleman, 1988). Sentences categorized as submissive were rated as significantly less dominant than sentences categorized as dominant. Dominance ratings did not differ between positive and negative sentences.

Face-Behavior Pairs. The 64 faces and 64 sentences were matched to create an equal number of stereotype-congruent (babyfaced/submissive or mature-faced/dominant) or stereotype-incongruent (babyfaced/dominant or mature-faced/submissive) face-behavior pairs. There was an even distribution of pairings for each condition across the age and gender of the faces.

Study Design

Within the encoding task, half of the faces were presented in combination with behaviors that conferred their appearance-based stereotype. The other half of the faces were paired with behavioral sentences that were incongruent with their appearance. The retrieval task was set up so that half of the lure faces have facial characteristics that are the opposite of the targets' (e.g.,

babyfaced paired with mature-faced), while the other half of the lure faces were paired with target faces of the same facial maturity.

Procedure

Upon arrival to the study, participants were provided an informed consent form followed by a demographics questionnaire to collect basic information about participants and health information.

Encoding Task. Participants began the experimental procedure by practicing the encoding task. Participants were read instructions by the experimenter and told to read the instructions to themselves by following along on the computer screen. They then went through four practice trials. Once participants completed and understood the instructions, they began the encoding task. Stimuli were presented using E-Prime (Psychology Software Tools, Pittsburgh, PA). Participants were instructed to press the number 1 to acknowledge that they see the face, which was presented alone on the screen for a total of 2 seconds. The face was presented in this manner to trigger any immediate stereotypes based solely on facial appearance. Following this, the participants saw that same face paired with a behavioral sentence that indicates dominance (e.g., “When the compass broke, he led the group north”) or submissiveness (e.g., “He asked everyone which movie they wanted to see”) for five seconds. Participants were instructed to press the number 2 when they read and understand the sentence below the face. They were told to input their responses promptly, though the program did not continue until the full 5 seconds had elapsed. The purpose of the button presses was to ensure consistent attention during the encoding process.

The faces were shown in four blocks containing 16 faces of the same age and gender. There were 6 seconds of fixation between each block. The order of the age-gender blocks was counterbalanced (i.e., one-fourth of participants saw older-female faces first, one-fourth saw older-male faces first, etc.) through each of the eight version of the task. In an attempt to improve participants' performance on the task, each face-behavior pair appeared twice with the same behavioral sentence. They were displayed in a random order once each run, for two runs.

Following completion of the encoding task and before beginning the retrieval task, participants were dispensed a digit comparison measure. This delay between the two memory tasks serves to reduce recency effects, and the measure was used to characterize the effects of aging and individual differences on speed of processing (Hedden et al., 2002).

Retrieval Task. Participants completed a self-paced source memory task. The task involved the presentation of two faces of the same age group and gender. Each of the two faces were previously paired with either a dominant or submissive behavior in the encoding task. Below the two faces presented was either the question "Which person is more submissive?" or "Which person is more dominant?" Participants were instructed to choose their responses based on their memory for the face-behavior pairs in the encoding task, relying on their gut reaction if they were uncertain. Their responses were recorded by pressing the key the corresponded to the left or right face on the screen. In each pair, one face was the "target" (correct response) and one face was the "lure." The behavior previously paired with the lure face in the encoding task was designed to never match the source memory question (i.e., one face was paired with a dominant behavior and one face was paired with a submissive behavior). Half of the pairs were matched in facial maturity (e.g., babyfaced paired with babyfaced) and half were mismatched (e.g.,

babyfaced paired with mature-faced). There was an even distribution of matched and mismatched facial maturity pairs among all combinations of age groups and genders. Each face appeared in the task twice: once as a target and once as a lure. After completing the retrieval task, participants completed additional paper and pencil tasks to characterize their cognitive abilities.

Results

Retrieval Accuracy

Retrieval accuracy was analyzed using a 2x2x2x2 mixed ANOVA, with the between-groups factor of Age Group (younger adult or older adult) and within-groups factors of Face-Behavior Congruence (congruent or incongruent), Lure Facial Characteristics (different or matched), and Age of Face (young or old). A complete breakdown of retrieval accuracy scores can be found in Table 1.

Overall, performance by younger adults (M = 79.20%, SD = 2.40%) was better than that by older adults (M = 66.90%, SD = 2.40%), $F(1, 46) = 13.48$, $p = 0.001$, $\eta_p^2 = 0.23$ (see Figure 1). Contrary to our hypothesis, the expected interaction between Age Group and Face-Behavior Congruence was not supported by our data, $F(1, 46) = 0.28$, $p = 0.60$. Consistent with our hypothesis, however, we did see an interaction between Age Group and Age of Face, $F(1, 46) = 6.19$, $p = 0.02$, $\eta_p^2 = 0.12$ (see Figure 2). Younger adults had worse source memory for older faces (M = 74.10%, SD = 12.74%) compared to younger faces (M = *84.40%, SD* = 13.72%), $F(1, 46) = 17.21$, $p < 0.001$, $\eta_p^2 = 0.27$, demonstrating an own-age bias in source memory. Older adults, however did not exhibit an own-age bias, as older adults' source memory for younger

faces (*M* = 67.70%, *SD* = 13.72%) was not different from older faces (*M* = 66.10%, *SD* = 12.74%), $F(1, 46) = .40$, $p = 0.53$, $\eta_p^2 = 0.09$.

There was also a main effect of Age of Face $F(1, 46) = 11.42$, $p = 0.001$, $\eta_p^2 = 0.20$, such that participants had better source memory for younger faces (M = *76.00%, SD* = 13.55%) as compared to older faces (*M = 70.10%, SD* = 12.64%) (see Figure 3). Interestingly, there was a trend toward a four-way interaction between Age Group, Face-Behavior Congruence, Lure Facial Characteristics and Age of Face, $F(1, 46) = 2.75$, $p = 0.10$, $\eta_p^2 = 0.06$. This marginal interaction was driven by a tendency for younger adults to have worse source memory for older incongruent (*M = 69.80%, SD* = 5.01%) versus congruent (*M = 78.1%, SD* = 4.79%) face-behavior pairs when, at retrieval, the lure facial characteristics differed from versus matched the target, $F(1, 46) = 2.54$, $p = 0.12$, $\eta_p^2 = 0.05$ (see Figure 4a). This interaction could also be potentially driven by a tendency for older adults to have better source memory for younger incongruent (*M = 70.80%, SD* = 4.69%) versus congruent (*M = 65.60%, SD* = 4.44%) face-behavior pairs when, at retrieval, the lure facial characteristics were the same as the target, $F(1, 46) = 2.31$, $p = 0.14$, $\eta_p^2 = 0.48$ (see Figure 4b). No other effects approached significance, *p*s > .32.

Discussion

This study explored how aging impacts the use of appearance-based biases in source memory. We predicted that older adults would experience more source memory errors due to age-related cognitive decline. However, based on the current literature we additionally hypothesized that older adults might have either increased *or* decreased use of appearance-based

inferences when making source memory. We also predicted that younger adults would have an own-age bias in source memory to a greater degree than older adults, who have perceptual experience with both younger and older faces.

Our results suggest that although older adults' performance on the retrieval task was worse than younger adults' performance, this impairment may not be related to age differences in the use of appearance-based stereotypes when making source memory decisions. It is possible that older adults rely on both schematic knowledge and trait-diagnostic in making judgments during retrieval, thus nullifying a trend in either direction. Another reason for our unsupported hypothesis may be due to an insufficient sample size of 24 subjects in each age group. Previous research (Cassidy et al., 2012) utilized a larger sample size of younger adults and a more difficult encoding task (i.e., less encoding time) in order to illustrate the effects of appearance-behavior congruity on source memory. Thus, if older adults use appearance-based biases less than younger adults, more participants in each age group in tandem with an encoding task modified to be more difficult may be necessary to detect these possibly subtle effects.

As predicted, we observed that younger adults experienced more own-age bias than older adults in source memory. Younger adults had increased source memory for young, own-age, versus older, other-age faces. In contrast, older adults' performance was similar for identifying both own- and other-age sources. This is aligned with current research, which states own-age bias is a phenomenon not seen in older adults ((Bäckman, 1991); (Bartlett & Leslie, 1996); (Fulton & Bartlett, 1991); (Havard & Memon, 2009). This may be because older adults were once young adults and thus still process young faces similarly to younger adults (Bryce & Dodson, 2012). It is also possible that younger adults' exposure to older adults is limited, while

older adults come in frequent contact with younger adults (Anastasi & Rhodes, 2005). Though Bryce and Dodson (2012) examined source memory and own-age bias previously in older adults, our findings extend this research. We show that, though the older adults' performance was worse overall, they did not show any own-age bias. This could be beneficial for older adults if older adults' source memory confidence is equally accurate regardless of face age; whereas younger adults' source memory may be deceptively confident and influenced by face age. Situations such as judicial proceedings may thus be complicated if a younger, versus an older, adult was expected to remember a situation involving an other-age individual.

Interestingly, results showed a marginal interaction between age group, face-behavior congruence, lure facial characteristics and age of face. Younger adults' source memory for other-age incongruent face-behavior pairs was worse than their source memory for other-age congruent face-behavior pairs, when the lure face characteristics were different from versus matching the target. In contrast, older adults' source memory for other-age congruent face-behavior pairs was worse than their source memory for other-age incongruent face-behavior pairs, when the facial characteristics of the lure was matched versus differing from the target. Although it is difficult to tease apart the complexities of a four-way marginal interaction, it seems younger adults have a congruity bias in source memory for other-aged faces, particularly when the lures facial characteristics are consistent with the *source memory question*. Older adults do not show this bias. Instead, older adults' performance shows an incongruity bias in source memory for other-aged faces when the lure *facial characteristics* matched that of the targets. When choosing between two potential sources of information, there may be age differences in how individuals process the various cues presented to them. Further research to elucidate the mechanisms of

source memory and appearance-based bias may help us understand what specifically is driving this interaction. Though, because the interaction is merely marginal, these inferences should not be considered with the same weight as more significant interactions.

This research was limited by a number of factors. First, the participants were recruited from a population of convenience, so we were tested high-achieving, high-functioning older adults. Our younger adult participant pool is comprised singularly of Brandeis undergraduates enrolled in Introduction to Psychology. Thus, our bata was biased by the use of a relatively high-functioning, self-selecting group who made the choice to attend Brandeis University and enroll in an Introduction to Psychology course. Given that we did not obtain a representative sample of human subjects, our results may not apply to the source memory of all human beings. It is possible that a lower-functioning population would not only perform worse overall when compared to high-functioning older adults, but perhaps also rely *more* on stereotypes than the tested sample of older adults. Second, as with all experimental research, the simulated situation designed for investigating source memory may not properly replicate real-life situations. Participants may not have been motivated enough by our impression-formation reaction time cover story, and this may have negatively influenced their performance if they were not paying attention to the task. Moreover, many of the participants had been subjects in previous studies in the lab, and thus may have anticipated the memory task, potentially resulting in increased anxiety during encoding, and possibly less susceptibility to our congruity manipulation if older adults were very focused on encoding the provided person information. Finally, it may have been useful to test a larger number of subjects in order to tease out perhaps subtle differences in how younger and older adults employ appearance-based biases in source memory.

Current understanding of the use of appearance-based stereotypes in source memory is now a bit more complex. Though we did not see a clear support among the older adults for the enhanced use of schematic knowledge or greater use of trait-diagnostic information during impression formation relative to young, results showed that older adults performed worse than younger adults on the retrieval task overall. We also saw support for previous research suggesting that younger, but not older, adults experience own-age bias in memory tasks ((Bäckman, 1991); (Bartlett & Leslie, 1996); (Fulton & Bartlett, 1991); (Havard & Memon, 2009), and extended this to source memory. In considering future directions for this research, it may be useful to elucidate the mechanisms by which source memories are formed with regard to techniques or heuristics, as well as the neural processes underlying these mechanisms. Further exploring individual differences in why some older adults may rely on schematic knowledge over trait-diagnostic information during impression formation, and vice versa, may elucidate why age differences in source memory were not complicated by the congruity face-behavior information at encoding.

		Retrieval Accuracy			
		Congruent		Incongruent	
Age Group	Face age	Different	Matched	Different	Matched
Young	Young	84.38(23.09)	85.00(15.60)	85.00(21.40)	82.81(19.09)

Young	Old	78.13(19.59)	73.44(19.26)	70.80(20.50)	75.00(16.89)
Old	Young	68.75(24.17)	66.00(17.80)	66.00(19.90)	70.83(18.31)
	Old	68.23(19.50)	65.10(22.11)	68.20(22.11)	63.02(18.60)

Descriptive statistics for retrieval accuracy

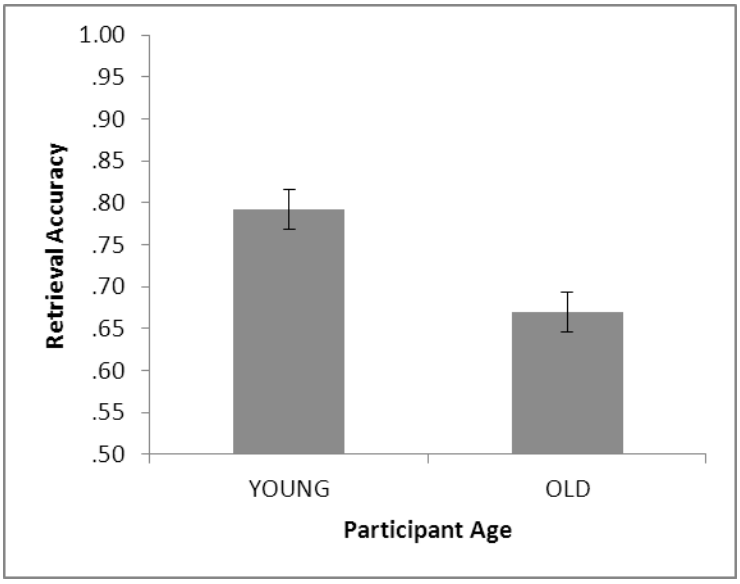

Figure 1. Younger adults performed significantly better on the source memory task than older adults.

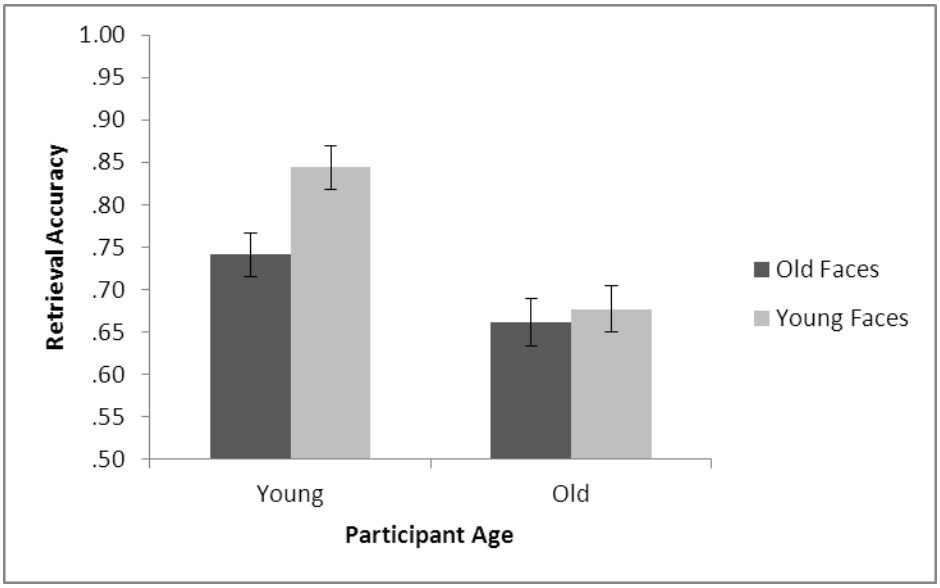

Figure 2. Younger adults had better source memory for own- versus other-age face, while this relationship was not evident among older adults.

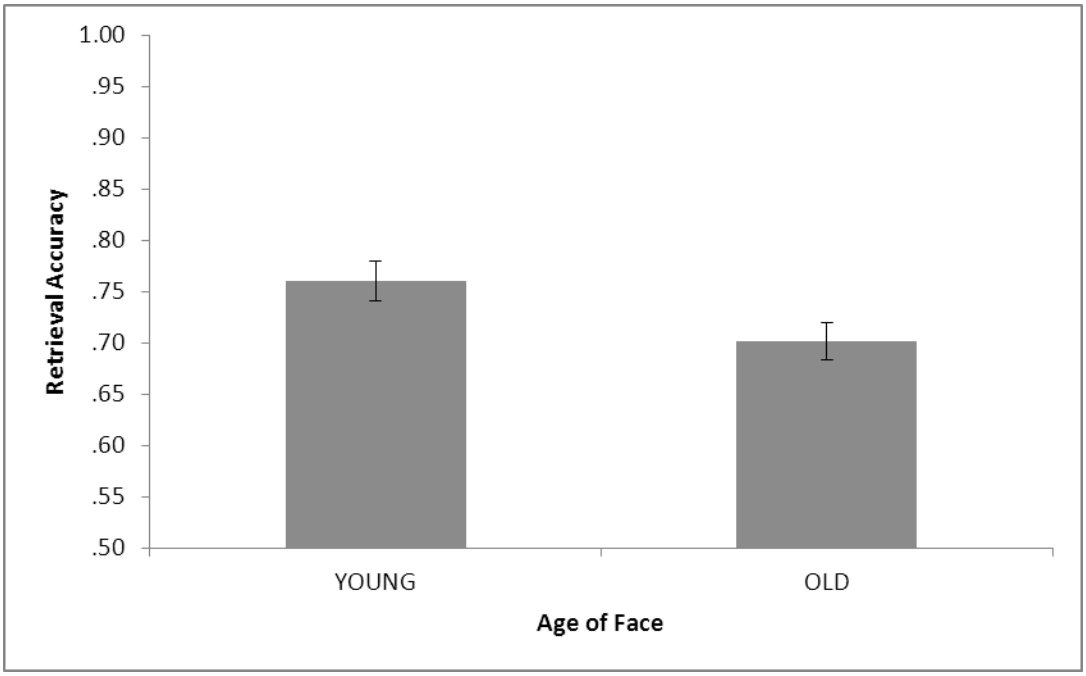

Figure 3. Overall, source memory for young stimuli was better than for older stimuli.

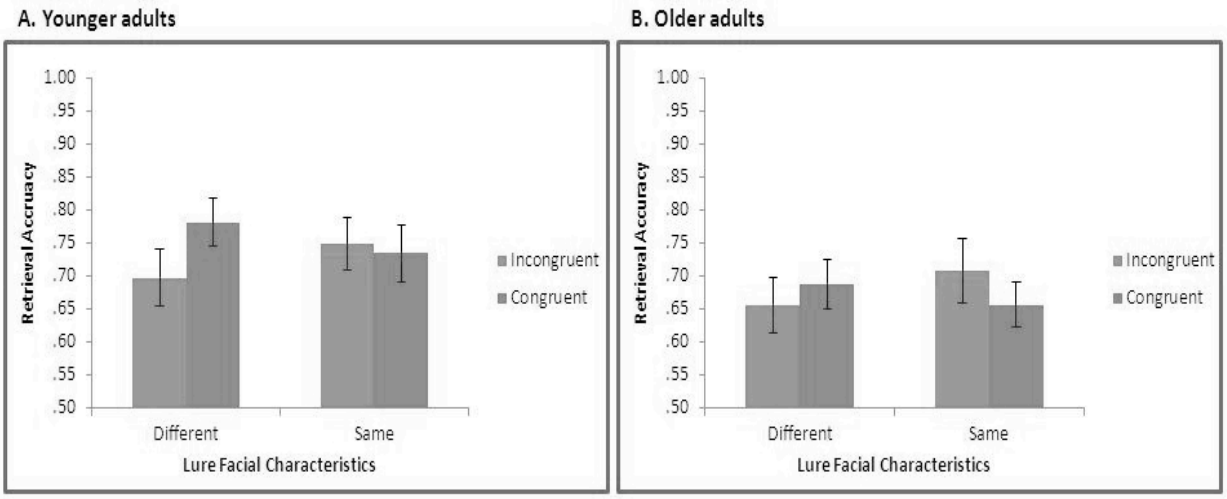

Figure 4. Younger adults had worse source memory for other-age incongruent versus congruent face-behavior pairs when, at retrieval, the lure's facial characteristics differed from versus matched the target (A). Older adults had better source memory for other-age incongruent versus congruent face-behavior pairs when, at retrieval, the lure's facial characteristics matched versus differed from the target (B).

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