Reducing Own-Age Bias: Does Contact Improve Young Adults' Recognition of Older Faces?

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The current study examined whether young adults' own-age bias—better recognition for same-age faces than other-age faces—decreases after contact with older people. Recent evidence suggests that contact with other-race faces improves recognition memory for other-race faces (Sangrigoli, Pallier, Argenti, Ventureyra, & de Schonen, 2005). To extend this finding to the own-age bias, we tested 9 participants' face recognition accuracy before and after they volunteered with older people and compared it to that of 8 participants who did not volunteer. Though all participants demonstrated own-age bias, interaction with older people did not reduce it. Alternative explanations for these findings are discussed.

The ability to accurately recognize human faces plays a vital role in our daily interactions with others. For example, distinguishing between friends and strangers or identifying criminal suspects relies on one's memory for faces. Previous research has reported that individuals have an own-race bias (ORB) in face recognition: people display better recognition for faces of their own race than for cross-race faces. Although various research methodologies have been used, ORB is a robust effect (Levin, 2000; Meissner & Brigham, 2001; Sporer, 2001a).

Emerging evidence indicates that in addition to the ORB, an own-age bias (OAB) also affects face recognition abilities. Individuals tend to display better recognition for own-age faces than for faces outside of their age group (Anastasi & Rhodes, 2005, 2006; Bäckman, 1991; Fulton & Bartlett, 1991; Mason, 1986; Perfect & Harris, 2003; Perfect & Moon, 2001; Wright & Stroud, 2002). For instance, Bäckman (1991) demonstrated that young adults (19- to 27-year-olds) were better at recognizing younger than older faces, and older adults (63- to 70-year olds) displayed the opposite pattern. Interestingly, 76-year-olds and 85-year olds did not show an OAB. More recently, Anastasi and Rhodes (2005) found that children (5- to 8-year-olds) and older adults (55- to 89-year-olds) displayed an OAB. In addition, Anastasi and Rhodes (2006) reported an OAB for younger (18- to 25-year-olds), middle-aged (35- to 45-year-olds), and older (55- to 78-year-olds) participants.

Although research has demonstrated the existence of these biases, there is no consensus on what might moderate these effects. To explain the ORB, some researchers have posited that the amount of contact an individual has with other racial groups may affect recognition (Brigham & Malpass, 1985; Slone, Brigham, & Meissner, 2000). For example, studies showed that White children from integrated schools and neighborhoods showed a smaller cross-race recognition bias than children from nonintegrated schools and neighborhoods (Cross, Cross, & Daly, 1971; Feinman & Entwistle, 1976). Slone et al. (2000) found that White participants' recognition accuracy for cross-race faces was positively correlated with their self-reported degree of contact with Blacks. More recently, Sangrigoli, Pallier, Argenti, Ventureyra, and de Schonen (2005) reported that individuals of Korean heritage who grew up in

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Caucasian families recognized Caucasian faces better than Korean faces.

The contact hypothesis, however, has received mixed support as an explanation for the ORB (Meissner & Brigham, 2001). In some studies, the correlation between contact and cross-race recognition ability is weak or nonexistent (Brigham & Malpass, 1985). One study that compared the recognition skills of White and Asian students for White and Asian faces concluded that amount of cross-race contact did not influence the ORB (Ng & Lindsay, 1994).

Although the effect of contact on the ORB remains unclear, the contact hypothesis provides a possible explanation for the OAB. Perhaps young adults have less contact with older adults, which results in poorer memory for older faces. To date, no published study has attempted to investigate the effect of contact with older adults on the OAB. Thus, in the present study, we examined the effect of recent contact with older adults on young adults' face recognition accuracy before and after participants completed a semester of volunteer work with older clients. We compared the recognition accuracy of these young adults to a group of young adults who did not work with older adults during the semester. During pre- and post-testing, we used the traditional two-phase face recognition paradigm often used to measure face recognition accuracy in studies of both the ORB and OAB. In this paradigm, participants are shown photographs of faces during an encoding phase. Then, during a recognition phase, participants view new and previously-viewed faces and indicate whether they had seen each face during encoding (Sporer, 2001a). We hypothesized that all young adults would display an OAB. More importantly, we predicted that recognition accuracy for older faces would improve from pre- to post-testing, but only for those young adults who volunteered with older adults.

Method

Participants

Seventeen 19- to 21-year-olds ($M\ age = 19.59$; 1 man), recruited from Gerontology ($n = 9$) and Abnormal Psychology ($n = 8$) courses at a small private college in the northeastern U.S., participated. The experimental group consisted of 9 students (3 from Gerontology and 6 from Abnormal Psychology) who volunteered with older people for an average of 3.44 hours per week ($SD = 2.55$) for 14 weeks; the control group consisted of 8 students (5 from Gerontology and 3 from Abnormal Psychology) who did not work with older people and opted to write a paper instead. Students were given this option by their course instructor. All participants self-identified as White; most were first- or second-year students.

Materials

We created two PowerPoint slideshows, Test A and Test B, with photographs of different younger (16- to 29-year-old) and older (65- to 85-year-old) target faces. We selected photographs from the Productive Face Lab Database (Minear & Park, 2004) so that participants would not recognize any of the people depicted. Photographs consisted of individuals' heads and shoulders in front of a neutral gray background. The individuals had minimal or no make-up, jewelry, bright clothing, or prominent features. All photographs depicted White faces to avoid a cross-race effect.

Tests A and B each consisted of encoding and recognition phases. The encoding presentations consisted of 20 forward-facing faces: 10 each from the younger and older target ages. Half of the faces were men and half were women. Faces were randomly ordered, except that no more than three faces in a row were of the same target age group or gender.

The recognition presentations consisted of 40 right-facing faces. Half of the faces were of individuals shown during encoding and half were foils. We randomly ordered faces with the constraint that no more than three in a row were of the same gender or age group. In addition, no more than three in a row were familiar faces (i.e., faces shown during encoding). We showed right-facing profiles during recognition instead of the same forward-facing photographs used in encoding to ensure that participants recognized the face depicted during encoding and not a clue (such as a smudge mark) within the photograph itself. Researchers have argued that this technique more precisely measures face recognition rather than stimulus recognition (Sporer, 2001a).

To ascertain the extent of the experimental groups' volunteer experience during the semester and to help assess potentially confounding variables, we also administered two surveys: one after the pre-test and one after the post-test. Through a number of open-ended questions, the pre-test survey asked participants to: (a) describe any previous volunteering or work with older adults, (b) estimate how many hours per week they previously worked or volunteered with older adults, (c) indicate whether they planned to participate in a volunteering experience during the coming semester, and (d) estimate the number of waking hours they spent with people of various age groups, including older adults. Participants were asked to circle the age group with which they spent the most time.

The post-test survey asked participants to: (a) identify whether they had completed a volunteer experience during the semester and where they had completed it, (b) estimate how many hours per week they volunteered, (c) identify the age groups with whom they had worked, (d) rate their overall volunteer experience on a scale from 1 (*very negative)* to 10 (*very positive),* and (e) rate how much they enjoyed working with the identified age groups on a scale of 1 (*very negative)* to 10 *(very positive).* There was also space for participants to include comments about their experience. Participants were included in the experimental group if they indicated that they had completed a semester-long volunteer experience with adults in the 65 and older age group on the post-test survey.

Procedure

We tested face recognition accuracy at the beginning and end of the 14-week period. We randomly assigned 9 participants to view Test A as their pre-test and Test B as their post-test, while the remaining participants first viewed B and then A.

Procedures were the same for pre- and post-testing. We tested participants in groups of no more than 6, and they watched the presentations on a large projection screen. During encoding, we instructed participants to examine each face carefully, estimate the age of the individual, and attempt to remember the face. The presentation showed each face for 5 s followed by a blank white screen for 5 s. The recognition phase immediately followed encoding. During recognition, we instructed participants to identify whether each face was "familiar" or "new" on their answer sheet. As in encoding, each recognition face was shown for 5 s followed by a white screen for 5 s. We did not tell participants that half of the faces were new and half were familiar. After recognition, participants completed the appropriate survey. Each pre- and post-test session took about 30 min and participants received gift certificates for their participation.

Results

Pre- and Post-Test Survey Data

Pre-test survey. We used the pre-test survey data to assess the participants' previous experiences with older adults. An independent samples t test on participants' previous volunteer or work experience with older adults revealed no significant difference between the experimental and control groups, $t(15) = 1.33$, $p > .05$. On average, control group participants had previously worked with older adults for 2.63 hours per week (SD = 2.93), and experimental group participants, averaged 1.17 hours of previous experience per week (SD = 1.41). An independent samples t test on the amount of time spent with older adults showed no significant difference between groups, $t(15) = 1.75$, $p > .05$. Participants in the control group estimated that they spent an average of 1.38 hours per week (SD = 1.30) with older adults (including family members, teachers, etc.), and participants in the experimental group estimated that they spent an average of 3.33 hours per week (SD = 2.92) with older adults. All participants indicated that they spent the most time with 18- to 29-year-olds.

Post-test survey. The 9 participants in the experimental group rated their overall volunteer experience positively (M = 7.56, SD = 1.33). They also reported that they enjoyed working with adults aged 65 and older (M = 7.44, SD = 0.50), although some commented that they "preferred working with kids" or found it "difficult to know what to say" when conversing with older people.

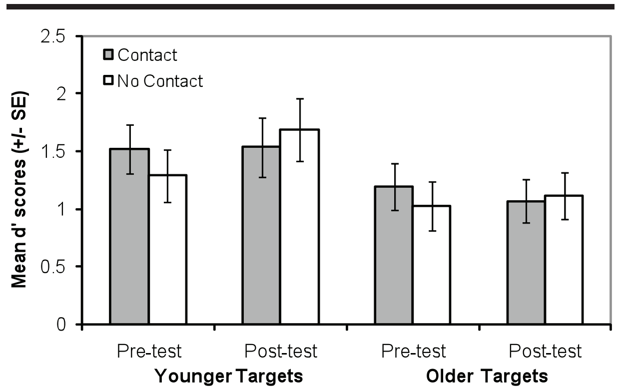
Recognition Accuracy

To examine recognition accuracy, we used methods suggested by signal detection theory (Stanislaw & Todorov, 1999). We first counted participants' hits (i.e., the number of correctly identified targets) and false alarms (i.e., number of distracters participants labeled as "familiar.") We then used these two scores to calculate d', a measure of overall accuracy.

We conducted a 2 (target age: younger vs. older) x 2 (test: pre vs. post) x 2 (contact: contact with older people vs. no contact) mixed-factors analysis of variance (ANOVA). As predicted, the main effect of target age was significant, $F(1, 15) = 5.29$, $p < .05$. Participants more accurately recognized younger faces (M = 1.51, SD = 0.69) than older faces (M = 1.10, SD = 0.57; see Figure 1). However, contrary to our hypothesis, the main effect of contact was not significant. Participants who had contact with older people (M = 1.33, SD = 0.61) did not differ significantly from those who did not have contact (M = 1.28, SD = 0.66). Moreover, the

FIGURE 1

Average d' scores reveal that participants recognized younger faces better than older faces, regardless of their degree of contact with older people. Error bars represent standard errors.



main effect of test type was not significant. Participants did not perform significantly better on the post-test (M = 1.35, SD = 0.65) than on the pre-test (M = 1.26, SD = 0.61).

Most importantly, the ANOVA did not reveal any statistically significant interactions. The main pattern in the data indicates that participants displayed an OAB during both pre- and post-testing, regardless of their level of contact with older people.

Discussion

Overall, our data are consistent with past research on the OAB; participants exhibited an OAB in face recognition (Anastasi & Rhodes, 2005, 2006; Bäckman, 1991; Fulton & Bartlett, 1991; Mason, 1986; Perfect & Harris, 2003; Perfect & Moon, 2001; Wright & Stroud, 2002). However, we found no support for the contact hypothesis; participants who volunteered with older people did not subsequently display better recognition accuracy for older faces. We also did not find a practice effect. Participants' scores did not significantly improve from pre- to post-testing.

These results are perhaps not surprising, as research on the ORB has also found only mixed support for the contact hypothesis. While some researchers found a correlation between contact and cross-race face recognition ability (Byatt & Rhodes, 1998; Slone et al., 2000), others did not find a significant effect (Brigham & Malpass, 1985; Ng & Lindsay, 1994). Moreover, a recent meta-analysis of studies of the own-race bias concluded that only 2% of the variance in cross-race recognition ability was due to differences in levels of interracial contact (Meissner & Brigham, 2001).

Although the contact hypothesis makes intuitive sense, other theories may better explain the OAB. For instance, Levin (2000) proposed a feature-selection model that emphasizes the tendency to quickly categorize faces into an in- or out-group. The feature-selection model hypothesizes that individuals think categorically about out-group members, focusing on social categories such as age, sex, and race, while individuating in-group members by focusing on their individual and unique features. Encoding these unique features rather than categorical features improves recognition of in-group faces. The results of several studies have supported Levin's (2000) model, suggesting that the ORB is caused by people encoding in-group and out-group faces differently (e.g., Hugenberg, Miller, & Claypool, 2007). In the current study, despite interacting with older people, our participants likely still categorized their faces as belonging to an out-group, which may have led them to use less efficient processing methods to encode older faces.

Our study had a few limitations. First, we did not randomly assign participants to the experimental and control groups. Although we found that the groups did not significantly differ in terms of previous amount of time spent with older adults, differences could exist between the two groups on other relevant variables such as memory abilities or attitudes towards older adults. Second, we tested only 17 participants, and just one of them was male. Although we did not find support for the contact hypothesis, a larger sample size may be necessary to detect an effect of contact. Third, our use of forward-facing photographs during encoding and right-facing photographs during recognition may help tease apart the differences between stimulus recognition and face recognition (Sporer, 2001a) but may also have decreased participants' overall recognition abilities (Sporer, 1994). Finally, our participants may not have worked with older people for enough time to reduce their OAB. On average, the participants worked for 3.5 hours per week for 14 weeks. In addition, the *quality* of the participants' contact with older adults may be an issue. Both Brigham and Malpass (1985) and Sporer (2001b) have theorized that contact needs to be positive in order to reduce the cross-race bias.

To attempt to address some of these limitations, future studies could use larger and more gender-balanced samples that have more contact with older adults. Research could also focus on operationally defining and examining the influence of positive versus negative contact on the OAB. Additionally, researchers could randomly assign participants to experimental and control groups and control their exposure to older adults' faces in the laboratory setting.

In conclusion, our results show that the age of the face should be considered when analyzing face recognition ability. Knowledge of bias effects is imperative for people who evaluate and rely on eyewitness memory to solve crimes. Although we found no support for the contact hypothesis, our work may encourage others to examine the underlying mechanisms for the OAB.

References

Anastasi, J. S., & Rhodes, M. G. (2005). An own-age bias in face recognition for children and older adults. *Psychonomic Bulletin & Review, 12,* 1043-1047.

Anastasi, J. S., & Rhodes, M. G. (2006). Evidence for an own-age bias in face recognition. *North American Journal of Psychology, 8,* 237-252.

Bäckman, L. (1991). Recognition memory across the adult life span: The role of prior knowledge. *Memory & Cognition, 19,* 63-71.

Brigham, J. C., & Malpass, R. S. (1985). The role of experience and contact in the recognition of faces of own- and other-race persons. *Journal of Social Issues, 41,* 139-155.

Byatt, G., & Rhodes, G. (1998). Recognition of own-race and other-race caricatures: Implications for models of face recognition. *Vision Research, 38,* 2455-2468.

Cross, J. F., Cross, J., & Daly, J. (1971). Sex, race, age, and beauty as factors in recognition of faces. *Perception and Psychophysics, 10,* 393-396.

Feinman, S., & Entwistle, D. R. (1976). Children's ability to recognize other children's faces. *Child Development, 47,* 506-510.
Fulton, J. C., & Bartlett, A. (1991). Young and old faces in young and old heads: The factor of age in face recognition. *Psychology and Aging, 6,* 623-630.
Hugenberg, K., Miller, J., & Claypool, H. M. (2007). Categorization and individuation in the cross-race recognition deficit: Toward a solution to an insidious problem. *Journal of Experimental Social Psychology, 43,* 334-340.
Levin, D. T. (2000). Race as a visual feature: Using visual search and perceptual discrimination tasks to understand face categories and the cross-race recognition deficit. *Journal of Experimental Psychology: General, 129,* 559-574.
Mason, S. (1986). Age and gender as factors in facial recognition and identification. *Experimental Aging Research*, *12*, 151-154.
Meissner, C. A., & Brigham, J. C. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Psychology, Public Policy, and Law, 7,* 3-35.
Minear, M., & Park, D. C. (2004). A lifespan database of adult facial stimuli. *Behavior Research Methods, Instruments, & Computers, 36,* 630-633.
Ng, W. J., & Lindsay, R. C. L. (1994). Cross-race facial recognition: Failure of the contact hypothesis. *Journal of Cross-Cultural Psychology, 25,* 217-232.
Perfect, T. J., & Harris, L. (2003). Unconscious transference and false identification in younger and older adults. *Memory and Cognition*, *31*, 570-580.
Perfect, T. J., & Moon, H. C. (2001). The own-age effect in face recognition. In J. Duncan, P. McLeod, & L. Phillips (Eds.), *Measuring the mind* (pp. 317-337). Oxford: Oxford University Press.
Sangrigoli, S., Pallier, C., Argenti, A. M., Ventureyra, V. A. G., & de Schonen, S. (2005). Reversibility of the other-race effect in face recognition during childhood. *Psychological Science, 16,* 440-444.
Slone, A. E., Brigham, J. C., & Meissner, C. A. (2000). Social and cognitive factors affecting the own-race bias in Whites. *Basic & Applied Social Psychology, 22,* 71-84.
Sporer, S. L. (1994). Decision times and eyewitness identification accuracy in simultaneous and sequential lineups. In D. F. Ross & M. P. Toglia (Eds.), *Adult eyewitness testimony: Current trends and developments* (pp. 300-327). New York, NY: Cambridge University Press.
Sporer, S. L. (2001a). The cross-race effect: Beyond recognition of faces in the laboratory. *Psychology, Public Policy, and the Law, 7,* 170-200.
Sporer, S. L. (2001b). Recognizing faces of other ethnic groups: An integration of theories. *Psychology, Public Policy, and Law, 7,* 36-97.
Stanislaw, H., & Todorov, N. (1999). Calculation of signal detection theory measures. *Behavior Research Methods, Instruments, & Computers*, *31*, 137-149.
Wright, D. B., & Stroud, J. N. (2002). Age differences in lineup identification accuracy: People are better with their own age. *Law and Human Behavior, 26,* 641-654.