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Inter-racial Contact and the Own-race Bias for Face Recognition in South Africa and England

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SUMMARY

Own-race bias, where people are more accurate recognizing faces of people from their own race than other races, can lead to misidentification and, in some cases, innocent people being convicted. This bias was explored in South Africa and England, using Black and White participants. People were shown several photographs of Black and White faces and were later asked if they had seen these faces (and several fillers). In addition, participants were given a questionnaire about inter-racial contact. Cross-race identification accuracy for Black participants was positively correlated with self-reported inter-racial contact. The confidence–accuracy relationship was strongest when making own-race judgements. Copyright © 2003 John Wiley & Sons, Ltd.

In July 1984 Jennifer Thompson, a White woman, was raped by a Black assailant in her apartment. Ronald Cotton was arrested and identified by Thompson in both a photo-spread and a live line-up. She appeared to be very confident in her identification as she claimed he had 'a really distinctive nose'. Based largely on this identification, in 1985 Cotton was convicted of raping Thompson. In 1987, while in prison, one of Cotton's fellow inmates confessed to the crime. This was not enough for Cotton's release given the weight placed on the eyewitness identification. It was not until 1995, when DNA evidence showed that Cotton was innocent, that his conviction was quashed. The DNA showed that the person who confessed was the culprit (Connors et al., 1996[1]). After being in prison for ten and a half years Cotton was offered $5000 compensation, which he refused.

How does the fact that the victim and the culprit were of different races affect the expected reliability of the eyewitness identification? For several decades researchers have been interested in what has become known as the own-race bias or ORB (for example, Malpass & Kravitz, 1969; Bothwell et al., 1989; Wright et al., 2001; for a review see

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[1]Additional information was gathered from the Frontline documentary web page at http://pbs.org/wgbh/pages/frontline/shows/dna (20 July 2002).

Chance & Goldstein, 1996; for a recent meta-analysis see Meissner & Brigham, 2001; for early insightful speculation see Feingold, 1914). The ORB refers to the finding that generally people are better at identifying faces of their own race than other races. The expectation therefore is that Jennifer Thompson's identification would have been more reliable if she was Black or if her assailant had been White.

In a recent survey, 90% of experts agreed that the ORB is reliable enough for expert scientific testimony (Kassin et al., 2001). This does not mean that the bias always occurs, that it is large, or that it is equally strong for everyone. Further, even with the consensus that ORB occurs, there is no generally agreed upon reason for why it occurs. The best-known explanation for the ORB is the 'contact hypothesis' (e.g. Brigham & Malpass, 1985; Valentine et al., 1995). According to this hypothesis, because people, in general, have more contact with people from their own race, they become experts at discriminating faces from their own race. Some studies have supported this hypothesis while others have not (see Slone et al., 2000). With data from a large number of studies, Meissner and Brigham's (2001) meta-analysis found a small, but significant, effect supporting the contact hypothesis. One problem with meta-analyses is that they combine data across very different samples and conditions (Oakes, 1986). Previously we have compared ORB in South Africa and England (Wright et al., 2001), specifically because of their different racial demographics.

Chiroro and Valentine (1995) also compared an African sample with a UK sample. They had two White and two Black groups of participants. The White participants were either from a college in a small English village (low contact with other race) or from a multiracial college in Zimbabwe (high contact with other race). The Black participants were either from a remote rural school in Zimbabwe (low contact with other race) or from the same multiracial college as the White high contact students. The two low-contact groups showed the predicted own-race bias. Black participants performed better with Black faces than with White faces, and the opposite for White low-contact participants. However, the results from the high-contact groups were less clear. The White high-contact students in Zimbabwe performed nearly identically to the White students in rural England, but the Black high-contact students showed no own-race bias. From this the role of contact in the ORB is not clear.

The current study examines ORB in England and South Africa. We tested White participants at the University of Bristol, England, and White and Black participants at the University of Cape Town, South Africa. We expected the participants in Bristol to have very little contact with Black people because there are very few Black students at the University of Bristol. We expected White participants in Cape Town to have more contact with Black people than the English participants, but because legal apartheid had only recently been abolished, contact would still be relatively rare. In comparison, some Black students at the University of Cape Town would have had much contact with White people, but others would not. This is because they were university students and the university has a higher proportion of White people than in the general population. For example, approximately 75% of the academic staff are White (www.uct.ac.za, 2001).[2]

Thus, we expected more inter-racial contact for our Black South African participants than the other groups. We also expected more variability among Black South African participants than the other groups. In order to measure contact we used a questionnaire by

[2]Because the University of Bristol has very few Black students, we did not include this group in our study. In our pilot work most of the Black participants sampled were not from England. If we had sampled from locations in England with other racial demographics, a Black sample could have been included.

Slone et al. (2000). The questions asked about the percentage of students in your school of the other race, how many friends you had of the other race, and how often you had conversations with people from the other race. There were minor adaptations simply to translate words and phrases so that they were appropriate for the English and South African education systems.

There are several ways to investigate memory performance. In Wright et al. (2001) we used a field experiment where a confederate spoke with the participants, and then later an experimenter asked them to try to identify the confederate. This is high in ecological validity, but with only one trial per person there is little information about each individual's performance. In order to get measures for individuals for both own and cross race memory, participants took part in many trials. This affected the ecological validity of the study, but was necessary. We used an old/new recognition procedure to measure memory accuracy.

METHOD

Sample

One hundred and fifty participants took part: 50 White students from the University of Bristol (England), 50 White students from the University of Cape Town (South Africa), and 50 Black students from the University of Cape Town. Students were recruited from around the psychology departments at the two universities. The English students were paid £5 (then approx. $8) and the South African students were paid 20 rand (then approx. $3). The levels of payment were based on the norms in the respective departments. All participants were undergraduates and 56% were female.

Stimuli

The stimuli consisted of 60 front-facing, head-and-shoulder, black-and-white photographs of Black and White young adult males (approx. 10 cm $\times$ 16 cm). None of the photographs were of people with unusual expressions, eyeglasses, facial hair, distinctive clothing, or excessive jewellery. Of the 60 faces, 30 were Black males and 30 were White males. A specially written Visual Basic computer program was used to present the pictures to the participants.

Procedure

Participants were seated between one and two metres away from the computer screen. They were told to look at the faces carefully. They looked at the series of 30 faces (15 Black and 15 White) presented to them on the screen. The faces were shown in a random order with a 3-second display time and a 2-second inter-stimuli rate, with the restriction that no more than three faces of the same race appeared consecutively. The timing was based on pilot research. Following this initial presentation phase, all participants were completed a 15-minute unrelated filler task.

In the recognition phase all 60 faces were presented to the participants, 30 from the test phase (referred to as 'old') and 30 not previously seen (referred to as 'new'). The 'new' faces consisted of 15 Black and 15 White male faces. The faces were presented in a random order on the screen. As each face was shown, participants were given a yes/no

recognition test and then rated their confidence on a 7-point scale. Finally the participants were asked to fill out the inter-racial contact questionnaire.

RESULTS

Hit rates and false alarm rates were calculated for each person for Black and White faces by taking the total number of hits (or false alarms), adding 0.5, and then dividing by the number of appropriate trials (15) plus one. This flattening constant makes hit rates of 0% and 100% have z-scores -1.86 and 1.86, rather than $-\infty$ and $+\infty$. Following Snodgrass and Corwin (1988) we use this for calculating all hit and false alarm rates. The measure of accuracy that we use is d' (z(hit rate)-z(false alarm rate)). Figure 1 shows the mean d' and 95% CI for each group for Black and White faces.

White participants were much more accurate with White faces than with Black faces. Black participants were also more accurate with White faces than with Black faces. Overall there was a main effect of the race of the face ($F(1, 147) = 121.7$, $p < 0.001$, $\eta^2 = 0.45$) with White faces being recognized more accurately. There is also a group effect ($F(2, 147) = 4.82$, $p = 0.009$, $\eta^2 = 0.06$); Blacks in South Africa performing less well overall. The important statistic for the ORB is the interaction, which is statistically significant ($F(2, 147) = 4.19$, $p = 0.02$, $\eta^2 = 0.05$), and is due to the difference between performance on Black and White faces being less pronounced for the Black South African participants than for the other groups ($F(1, 148) = 7.26$, $p = 0.008$, $\eta^2 = 0.05$). Thus, the ORB is demonstrated. Ideally the ORB is demonstrated by a crossover interaction. However, as discussed in the next section there are reasons for why some of the Black participants may have had good memory for White faces.

Inter-racial contact

We predicted the South African Black university students to have the most inter-racial contact, followed by the South African White university students. Slone et al.'s (2000) inter-racial contact questionnaire, modified only for language differences, was used. There

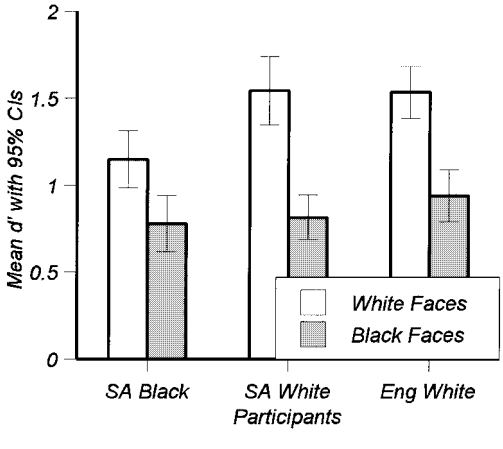

Figure 1. Mean d', with 95% between-subjects confidence intervals, for Black and White faces for each of the groups

were 13 questions about contact. Two of these had over 1/3 of the responses missing, so these questions were excluded from analysis. The excluded questions asked about contact with people during 'middle school' which was not applicable to many of the participants. The items are inter-correlated, resulting in a Cronbach's α of 0.87. Principal component analyses were conducted on the remaining variables to reduce them into a smaller number of components. A scree plot showed that there appears to be only one reliable component. The proportion of variance accounted for by the first few components were 44%, 14%, 10%, and 8%. A single score for inter-racial contact was made for each participant. All items loaded between 0.40 and 0.80 on this component. The means for the three groups differed in the expected directions, with the Black South African participants having the most inter-racial contact (mean = 0.40, se = 0.17) and the White English participants having the least (mean = −0.60, se = 0.10), with the White South African sample in between (mean = 0.20, se = 0.10). This pattern is reliably different from chance ($F(2, 147) = 17.12$, $p < 0.001$, $\eta^2 = 0.19$).

We compared the contact variable with the d' for cross-race identification within each group. As predicted, there was less variability on the contact variable for the White samples (var = 0.46 for the English, var = 0.47 for the South African) compared with the Black South African sample (var = 1.52) (Levene's statistics $F(2, 147) = 16.12$, $p < 0.001$). The lack of variability among the White samples makes it less likely to observe a significant correlation between contact and accuracy, and neither comparison was significant ($p > 0.30$, and approx. 1% of variation accounted for). Our primary interest was with the Black South African sample. Figure 2 depicts this relationship. It shows a sizable positive correlation $r = 0.41$, $p = 0.003$, the 95% confidence interval is from $r = 0.15$ to $r = 0.61$, calculated using Steiger & Fouladi, 1992). Self-reported inter-racial contact predicts inter-racial memory recognition accuracy for this population.

It is possible that people who score high on the inter-racial contact measure are simply better at face recognition, rather than just being better at cross-race recognition. This can be examined in several ways (Lord, 1967; Wright, 2003). We repeated the correlation

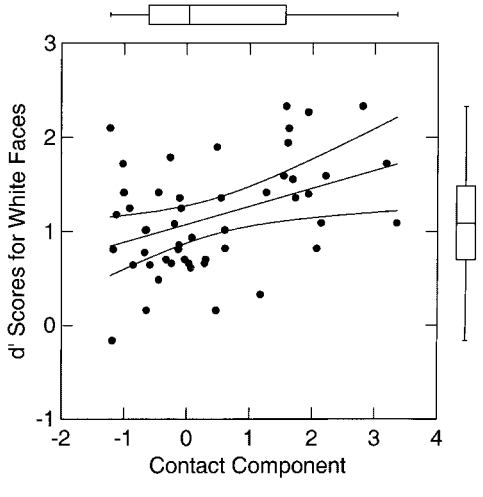

Figure 2. The relationship between self-reported inter-racial contact and accuracy on recognizing White faces for Black participants in South Africa. The contact variable is the principal component of 11 questions about inter-racial contact. Accuracy is the signal detection theory statistic, d'

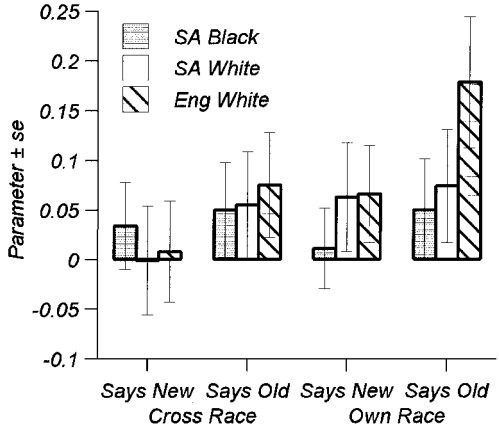

Figure 3. Parameters for predicting accuracy from confidence. These were found using the MLwiN multilevel logistic regression procedure. The relationship is stronger for own-race identifications and for faces that the person says are old

between recognition accuracy for White faces with the contact variable, but this time partialling out the recognition accuracy score for Black faces. The relationship remained large, partial $r = 0.40$, and statistically significant, $p = 0.004$.

Do confidence ratings predict accuracy?

There is much interest in the relationship between confidence and accuracy in memory research. The question most applicable to the eyewitness situation is if someone says 'old' how predictive is the confidence rating that they are correct. There is also interest in the predictive value of confidence for 'new' responses. These are investigated for all three groups for own- and cross-race identifications. Often researchers calculate a single measure, like Goodman and Kruskal's γ, for each person and then run statistical tests on these aggregate measures. Here, multilevel logistic regressions (Goldstein, 2003; Wright, 1997, 1998) are used where individual trials are nested within participants. These have the form:

$$logit\ Correct_{ij} = \ln \frac{Correct_{ij}}{1 - Correct_{ij}} = \beta 0 + \beta 1\ Confidence_{ij} + u_j + e_{ij}$$

The parameter $\beta 1$ measures the confidence accuracy relationship with zero meaning no relationship. Figure 3 shows the estimates for $\beta 1$ for each group for own- and cross-race faces, for when participants say the face was seen before (i.e. say old) and when they say the face was not seen before (i.e. say new). All but one of the estimates are above zero. The relationship is stronger for own-race identifications and for when the participants say 'old'.

DISCUSSION

Eyewitness misidentification is the leading cause of innocent people being falsely imprisoned (Huff et al., 1996; see Wright & Davies, 1999, for a review). In almost all

of the cases described in the National Institute of Justice's report (Connors et al., 1996) on convictions overturned based on DNA evidence, errant eyewitness identification was a factor (Wells et al., 1998, 2000). A survey of identification parades (i.e. line-ups) in London found that approximately 20% of the time an innocent person, a filler, was chosen (Wright & McDaid, 1996). While the filler would not be arrested, an innocent suspect could be. Numerous cases of people being wrongly convicted, like Ronald Cotton, have been described in the literature (for example, Cutler & Penrod, 1995; Loftus & Ketcham, 1991). The aim of our research is to understand one particular reason—cross-race identification—why some eyewitness identifications may be unreliable.

The own-race bias was demonstrated by the interaction between race of participant and race of face as shown in Figure 2. White participants in both countries were much better at identifying White faces than Black faces. Black participants were marginally better at recognizing White faces too. However, it is important to remember that these are Black university students who are exposed to more White people than most of the South African general population. In South Africa only about 11% of the population are White (1996 census figures from www.gov.za), but they make a much larger proportion of students at universities. Further, a disproportionate number of the White people in the country and at the universities (approx. 75% of the academics at University of Cape Town) are in power. When we (Wright et al., 2001) tested non-students in shopping centres, Black South Africans were better at recognizing Black faces than White faces.

It was predicted, and observed, that the Black South Africans reported the most inter-racial contact. We also predicted, and observed, that their contact scores would have greater variability; some reported relatively little contact while others reported much contact. Given the variability of scores for this group we felt this group was the most likely to yield a significant relationship between contact and accuracy. Figure 2 shows that the more self-reported contact, the higher the accuracy score. This gives further support to the contact hypothesis. However, a complete description of the relationship needs to take into account some of the social and political processes. It is important to keep in mind that the social and cognitive hypotheses we examine are couched within societies which may affect them.

Participants rated their confidence for each response. In a typical applied setting, the police/lawyers/judge/jury know the race of the defendant, the race of the eyewitness, and whether the eyewitness has made a positive identification. Therefore, we examined the predictive power of confidence for predicting accuracy within each of these eight cells separately for each of the three groups. Figure 3 shows that the relationship is stronger for own race faces and when the participant makes a positive identification (i.e. says old). This is consistent with both laboratory (Meissner & Brigham, 2001) and field studies (Wright et al., 2001), where own-race confidence is a good predictor of accuracy, but the relationship is much smaller for cross-race identifications. However, the effects are relatively small. Even for old judgements of own-race faces, the condition with the largest effect, the increased predicted probability of a correct response went from approximately 50% to 62% when confidence rose from 1, the lowest value on the scale, to 7, the highest value on the scale.

In summary, an own-race bias was found using data from South Africa and England, and self-rated inter-racial contact was predictive of accuracy for Black participants. This is important for understanding the reasons for the ORB. Blacks in South Africa are a particularly interesting group to study, as the changes in South African society mean that inter-racial contact is increasing for many individuals.

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