

The own-race bias in child and adolescent witnesses: Evidence from video line-ups

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Abstract

This study investigated the own-race bias in British school children using an eyewitness paradigm. Some 319 participants viewed films of two similar staged thefts, one that depicted a Caucasian culprit and the other an Asian culprit, and then after a delay of 2–3 days, viewed a line-up for each culprit. One hundred and seventy-six of the participants were Caucasian and 143 were Asian. There were also two age groups: 164 were aged 7–9 years and 152 were 12–14 years. There was a significant own-race bias for Caucasian participants from both age groups that resulted in more correct identifications for the own-race culprit from target present line-ups and more false identifications for the target absent line-ups. Asian participants from both age groups showed no own-race bias and performed equally accurately for culprits of both races. Measures of inter-racial contact were associated with correct responses for other-race targets and revealed that the majority of Caucasian participants in the current sample had very little contact with Asians, whereas the majority of Asian participants had high levels of contact with Caucasians.

Keywords

Line-up identification, eyewitness memory, child witness, adolescent witness, video line-up, own-race bias, cross-race identification

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Introduction

In 1983, Habib Wahir Abdal, then known as Vincent Jenkins, was convicted of raping a young white woman in a nature reserve in Buffalo, New York. The woman's initial description of the assailant was a black man with a hooded jacket, even though she had been blindfolded. The victim had been informed by police that Abdal was the suspect, however, she failed to identify him initially as her assailant. After viewing a photo that was 4 years old, the victim eventually identified Abdal from a show-up (where a single suspect is presented). Abdal served 16 years in prison until he was exonerated through DNA evidence (<http://www.theinnocentproject.org>). This is typical of a number of cases of

mistaken identity in which it has later been found that the suspect was wrongfully convicted; in many of these cases, the suspect is from a different racial group from the victim.

A fairly robust effect in the literature is the finding that people are generally better at recognizing faces from their own race, compared with other races. This bias has been referred to as the other-race effect, own-race bias (ORB), own-group bias and cross-race effect. ORB (the term we

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use here) appears to be greater in Caucasian Europeans than in other racial groups (Hancock and Rhodes, 2008; Jackiw et al., 2008; Walker and Hewstone, 2006). One meta-analysis by Bothwell et al. (1989) examined data from 11 face-recognition studies (with 14 samples) all using Afro-Caribbean and Caucasian participants. They found that both Afro-Caribbean and Caucasian participants recognized own-race faces more accurately than other-race faces. A subsequent meta-analysis by Meissner and Brigham (2001) analysed the data from 39 studies (with 91 samples). In this article, 56% of the sample were Caucasian, 32% were Afro-Caribbean and 12% were Arab/Turkish, Asian and Hispanic (other ethnicities). The majority of studies were face-recognition paradigms (91%) although some also used simultaneous target present (TP) line-up tasks (9%). The results from the analyses revealed that participants were less likely to recognize correctly previously seen other-race faces (hits), and more likely to recognize falsely other-race faces that had not been seen previously (misses). The ORB was found to be not significantly different for the Caucasian and Afro-Caribbean participants; however, Caucasian participants showed a larger ORB than the other ethnicities (Arab/Turkish, Asian and Hispanic).

Although there have been numerous studies with adult participants (for a review see, Bothwell et al., 1989; Brigham et al., 2007; Shapiro and Penrod, 1986; Sporer, 2001), development of the ORB and its prevalence in children's face recognition has not been subject to extensive research. Some studies have found that younger children (6–12 years) either show no ORB (Goldstein and Chance, 1980) or a reduced ORB (Chance et al., 1982) compared with older children (13–14 years) or adults. Goodman et al. (2007) carried out a multinational study with Caucasian children and adults in the USA, Norway and South Africa, where they were tasked with recognizing Caucasian, Asian and Afro-Caribbean faces. They found that Caucasian children aged 8–10 and 12–14 years and adults showed a significant ORB, and recognized own-race faces more accurately than other-race faces, however, those aged 5–7 years recognized all the faces equally well. Goodman et al. (2007, p. 241) suggest 'that cross-race face processing is not rigidly "fixed" during childhood' (p. 241) and may be more plastic for children than for adults. However, her conclusions are based on research that has almost exclusively focused on Caucasian samples.

The research that has examined developmental differences in processing other-race faces is inconclusive. Some studies report that infants can show a preference to look at own-race faces from as early as 3 months of age (Bar-Haim et al., 2006; Kelly et al., 2007; Sangrigoli and de Schonen, 2004). Furthermore, Corenblum and Meissner (2006) found that Euro-Canadian children (aged 6–14 years) were

more accurate when recognizing Caucasian faces than Afro-Caribbean faces, and there were no differences in performance as a function of participant age.

Although there have been several face-recognition studies investigating the cross-race effect, fewer have been conducted using the eyewitness paradigm. In their meta-analysis, Meissner and Brigham (2001) found that fewer than 10% had used line-ups. Another finding from the meta-analysis was that individuals were not only worse at recognizing faces from another race, but also were more likely to falsely identify other-race faces. (For review of the literature see Brigham et al., 2007.) Although this area has received little research from the eyewitness field, the Innocent Project found that of 70% of mistaken identification cases involved cross-race identification (www.theinnocentproject.org), making it a noteworthy area of research.

Most studies that have used line-ups to investigate the ORB have used adult witnesses. One study by Smith et al. (2004) asked Caucasian participants to identify either a Caucasian or Afro-Caribbean target they had seen previously, from either a TP line-up where the culprit was present, or a target absent (TA) line-up, where the culprit was not present. They found that participants made more correct identifications for own-race targets compared with other-race targets, and made more false identifications for other-race foils compared with own-race foils. In another study by Jackiw et al. (2008), Caucasians and First Nation (indigenous people of Canada) participants were presented with a series of First Nation and Caucasian faces, and then 12 line-ups (six TP and six TA). Jackiw et al. found that all participants were significantly more accurate with their own race, however, they were also more likely to choose from the First Nation line-up, compared with the Caucasian line-ups, especially the Caucasian participants.

In one of the few studies using child witnesses, Kask and Bull (2009) investigated identification of multiple suspects of different ethnicities. They presented Caucasian children (aged 8–10 years) and young adults (aged 16–19 years) in the UK with four target faces of different ethnicities (Caucasian, Afro-Caribbean, Latino and Turkish). After a delay, the children either saw a sequential line-up for each ethnicity (two TP and two TA) or 24 faces shown sequentially, and the participants either made a decision for each face individually, or once all the faces had been shown. Kask and Bull found that adults made more false identifications for other-race faces compared with own-race faces, but there were no differences in responses for the child witnesses. In the USA, Pezdek et al. (2003) presented Caucasian and Afro-Caribbean children (aged 5–6 and 8–9 years) and young adults ($M = 25$ years) a video depicting a Caucasian and an Afro-Caribbean man carrying out a cookery demonstration. After a 24-hour delay the participants were presented with a TP line-up for each target. Caucasian

participants were more accurate at identifying the Caucasian target and Afro-Caribbean participants were more accurate at identifying the Afro-Caribbean target. Furthermore, identification accuracy increased with age.

There are a number of social and cognitive theories as to why people are better at recognizing a face from their own race or group (see Sporer, 2001). One theory, the contact hypothesis, argues that through the high level of contact that individuals have with own-race faces, they become experts at recognizing such faces (Brigham and Malpass, 1985; Slone et al., 2000). By contrast, the comparatively lower amount of contact with other-race faces leads them to be relatively inexpert at differentiating between them (Hugenberg et al., 2007). According to the contact hypothesis, the more experience that individuals have with a different racial group the more accurate they should be at identifying members of that particular group (Brigham et al., 2007). The expertise gained from contact with own-race faces or other-race faces may result in different processing strategies being used. It has been well established that faces are usually processed holistically or configurally (Farah et al., 1995, 1998; Farah, Wilson et al., 1995; Tanaka and Farah, 1993, 2003), and it has been suggested that other-race faces may receive less holistic processing (Michel et al., 2006; Michel, Rossion et al., 2006; Rhodes et al., 1989; Tanaka et al., 2004) and poorer configural encoding (Hayward et al., 2008; Rhodes et al., 2006) compared with own-race faces. In a recent study, Hancock and Rhodes (2008) reported that did higher levels of self-reported contact with other-race faces not only reduced ORB, but it also reduced cross-race differences in configural coding.

The small number of studies using children tend to support the contact hypothesis and suggest that the majority race (e.g. Caucasian) shows an ORB as a result of reduced contact with minority races, whereas the minority race shows no bias, due to contact with the majority race. One study found that Caucasian (majority race) participants (aged 7, 12 and 17 years) were poorer at recognizing Afro-Caribbean faces than Caucasian faces, whereas Afro-Caribbean participants showed no bias and were equally good with both race faces (Cross et al., 1971). This pattern was also replicated by Feinman and Entwisle (1976) who found that African American children were better at recognizing Caucasian faces than Caucasian children were at recognizing African American faces; however, children who lived in a mixed race environment showed less ORB than those from segregated schools.

None of the early studies investigating ORB with children used a specific measure of inter-racial contact, and the studies that have used contact measures have predominantly used participants from only one race. A further study by Corenblum and Meissner (2006) used a measure of inter-racial contact with child participants (aged 7–10

years) and a face-recognition paradigm. Caucasian children (Euro Canadian) were asked to recognize African American, Native Canadian and Euro-Canadian child faces, and were also asked how much contact they had with other Native Canadian children. The results from Corenblum and Meissner's study revealed that children with lower levels of contact with Native Canadians were less likely to correctly recognize Native Canadian faces. Another study by Sporer et al. (2007) with German (majority race) and Turkish (minority race) children (aged 10–15 years) used a specific measure of inter-racial contact by asking participants about levels of contact they had with people of a different race. The participants in Sporer et al.'s study (2007) were tasked with matching faces to a 10-face array and they used response times rather than accuracy for the dependent variable. The findings reported that total amount of contact could predict the ORB and that overall German children had quicker response times for matching German faces than Turkish faces, however, Turkish children had equal response times for German and Turkish faces.

There is also evidence that inter-racial contact can influence the ORB from real-life situations. Studies have reported that Asian children who have been adopted by Caucasian families in Western Europe, show no ORB (de Herring et al., 2010) and in some circumstances the ORB was even reversed (Sangrigoli et al., 2005).

An alternative explanation for the ORB is Levin's feature selection hypothesis (1996, 2000). The feature selection model proposes that it is not differences in expertise that account for the ORB, but differences in processing styles for in-group versus out-group members. When processing in-group faces, observers typically look for features that differentiate one person from another, but when processing out-group faces, category specific features are encoded (e.g. skin tone) rather than individuating features. Similarly, Sporer's (2001) in-group/out-group model (IOM) assumes that when an individual encounters a different race face, an automatic process occurs which includes deeper processing of the face during encoding. According to IOM, when another race face is encountered, less effort is allocated during encoding which could lead to shallow (or feature based) encoding of the other-race face and, individuating information is ignored (Meissner et al., 2005). It has been suggested that the IOM can account not only for ORB, but other effects such as the own-age bias and effects of gender (Meissner et al., 2005).

The age of the witness can also influence identification accuracy. Children often make more false identifications from TA line-ups compared with adults, and in some cases fewer correct identifications in TP line-ups compared with adults (for a review of the literature please see Havard, 2014 and for a meta-analysis see Fitzgerald and Price, 2015). Children's poorer performance for TA line-ups may

relate to the social and task demands (Pozzulo and Lindsay, 1997), including the assumption that the perpetrator must be within the line-up (Gross and Haynes, 1996). This exerts an implicit pressure to select someone, but adults appear to have a greater capacity to resist this pressure than children (Beal et al., 1995; Ceci et al., 1987). It has also been suggested that children view giving a positive response as being more favourable than giving a negative response (Zajac and Karageorge, 2009), and that giving an answer is preferable to not giving any answer (Waterman et al., 2000). Children may feel, therefore, that they should choose someone from the line-up instead of saying 'the person isn't there' or 'I don't know'. A few studies have reported that older children, aged 12–14 years, can perform like adults on target-absent line-ups (Pozzulo and Lindsay, 1997; Pozzulo and Warren, 2003, Experiment 2), or more accurately than younger children (Havard et al., 2010). However, the age at which children behave like adults, especially on TA line-ups remains an empirical question (Havard, 2017).

Of the research that has been described thus far, no studies have investigated the ORB with children using an eyewitness paradigm and also measures of inter-racial contact. Moreover, few studies have used more than one racial group as participants. In the current experiment, the aim is to investigate the ORB with Caucasian and Asian child witnesses in the UK and ascertain whether measures of inter-racial contact can predict other-race identification from a video line-up. Our first hypothesis is that the Caucasian participants (the majority race) will exhibit an ORB and make more correct identifications for their own-race target for the TP line-ups. Additionally, the ORB may be present in the TA line-ups and Caucasian participants will make more false identifications for other-race target compared with the own-race target. Our second hypothesis is that Asian participants (who are the minority race) should be equally accurate at identifying the Asian and Caucasian targets from the TP line-ups, and also show no ORB on the TA line-ups. Third, if inter-racial contact influences the ORB then a measure of inter-racial contact should be predictive of ORB, and participants with higher levels of inter-racial contact should be more accurate with other-race targets. As a subsidiary hypothesis we predict that adolescents may make fewer false identifications for TA line-ups compared with our younger age group, as reported by previous research with video line-ups (Havard et al., 2010.)

Method

Participants

A total of 319 children were recruited from state-run primary and secondary schools. One hundred and seventy-six

Caucasian pupils were from the Aberdeenshire area and the 143 Asian pupils were from the East Midlands, UK. These locations were chosen as Aberdeenshire has a predominantly Caucasian population, whereas the East Midlands has a more ethnically diverse population. According to the Aberdeenshire Council school roll for 2009 (P. Argo, pers. commun., August, 2010) 94.7% of pupils were Caucasian and 0.51% Asian (0.11% Indian, 0.1% Pakistani, 0.06% Bangladeshi and 0.24% other Asian). According to Leicester City Council estimates, ~ 60% of the population is Caucasian and 31% Asian (28% Indian, 2% Pakistani, 1% Bangladeshi) (Roberts-Thomson, 2009).

There were two age groups 7–9 years ($M = 8.1$ years, 100 females and 64 males) and 12–14 years ($M = 13.01$ years, 107 females and 48 males). These age groups were selected because previous research found the older age group were more accurate in performance on the video TA line-ups, compared with the younger age group (Havard et al., 2010). Additionally, we wanted to test whether the ORB was greater for the older age group compared with the younger age group, as reported previously (Goodman et al., 2007). Consent to carry out the research was obtained from both the head teachers and legal guardians.

Materials

Two short films were created, one starred a male Caucasian (Target) actor (26 years of age) and the other was a male Pakistani (Asian target) actor (24 years of age). The films were identical except for the targets. Each film began with the target walking along a corridor towards the camera and trying several handles on the doors, until one opened. The next scene is of the target entering the door of an office and looking around, picking up a wallet from the table, then a laptop from another desk. The target then looks through several drawers and picks up a mobile phone. The target takes one final look around the room before leaving. The last scene is of the target walking back up the corridor with the laptop bag over his shoulder¹. The total time for each film was 1 min and 30 sec. Both targets were seen in full face frontal and profile views throughout the film.

Four 9-person video line-ups were created, half TP and half TA according to VIPER² specifications for each actor. The targets (actors) were filmed at a VIPER suite at a local police station in order that the line-up met the standard specific content. The line-ups were created by an experienced VIPER operator, in the same manner as a real identification parade would be made and foils were chosen in the same manner as Valentine et al. (2007). The same foils were used for the TP and TA line-ups, except the designated target replacement foil that was used in the TA line-ups. To control for factors that might affect identification

Table 1. Mean ratings for the target and foils for the Caucasian and Asian raters.

Rater	Faces	<i>M</i>	<i>SD</i>
Caucasian	Caucasian target	3.71	1.59
Asian		4.50	1.45
Total		4.11	1.55
Caucasian	Caucasian target	3.86	1.460
Asian		3.57	1.51
Total		3.71	1.46
Caucasian	Caucasian foils	4.00	0.88
Asian		3.79	0.98
Total		3.89	0.92
Caucasian	Asian foils	4.14	0.66
Asian		3.79	1.19
Total		3.96	0.96

accuracy, the images in the line-ups including the targets were rated by 28 individuals who did not take part in the study. There were two groups of raters; 14 Caucasians aged 21–57 (mean = 30.7) years and 14 Asians aged 20–39 (mean = 28.7) years. Each face was rated on a 1–7 scale for distinctiveness, i.e. ‘if you had to pick this person out of a crowd at a railway station, how easy would it be?’. A mixed factor ANOVA 2 (Face ethnicity: Asian vs. Caucasian) \times 2 (Face type: Target vs. Foil) were within subject factors and 2 (Rater ethnicity: Asian vs. Caucasian) was the between subject factor conducted on the mean ratings (Table 1). The results found no significant main effects or significant interactions (all *p*-values > .05).

The positions of both the designated target replacement foil (TA line-up) and target were manipulated so that for half the line-ups they appeared at position 4, hereafter referred to as Line-up A and for half position 6, hereafter referred to as Line-up B. This manipulation was to try and detect any bias to choosing early or late in the sequence. Each line-up member appeared as a standard VIPER film. In other words, there was a 15-sec. video clip of the person looking straight to the camera and then turning his head to the right and then to the left. All the VIPER files contained the head and shoulders and were filmed under the same lighting conditions against a grey background. Once the film has been made it was sent to the VIPER headquarters for quality control purposes before being approved (for more details about the quality control processes see Havard and Memon, 2009).

Design

The study employed a split plot design; 2 (Target: Caucasian vs. Asian) \times 2 (Line-up type: TP vs. TA) were within-group factors, and 2 (Witness: Caucasian vs. Asian) \times 2 (Witness Age: 7–9 years vs. 12–14 years) were

between subject factors. Each participant saw one TP and one TA line-up that were counterbalanced so that they could appear first or second and could either be the Caucasian or the Asian target. Subsequent analyses found no significant effects of order of film or line-up for identification responses.

The dependent variables were the line-up identification decisions. For the TP line-ups there were three possible responses; a correct identification (hit), a foil identification (false positive), or an incorrect rejection (miss). For the TA line-ups responses were either a correct rejection, or a false identification. Data for TP and TA line-ups were analysed separately, additional dependent measures were the sum of responses from the contact questionnaire.

Procedure

Initially, groups of children viewed two videos and again these were counterbalanced and could therefore see the Caucasian or Asian target first. They were told that the makers of the film wanted to get some feedback and would come back to the school to ask some questions, for example, ‘what do you think will happen next in the story?’.

In the second phase, 2–3 days later, children were tested individually and carried out the identification task. They were shown one line-up first and told that either the white man or the Asian man ‘may or may not be present’. Then, in accordance to the Police and Criminal Evidence Act (1984) in England and Wales and the Lord Advocates Guidelines in Scotland (2007) they were shown the line-up twice and told that they could pause the video at any time and they could go back and see any picture again. After the second viewing the participants were asked if they wanted to view any part of the line-up again. They were then asked if they had seen the white man (or Asian man) from the film. If they identified a person they were shown the line-up member and asked ‘is this the person you saw?’. Immediately after making an identification decision, the witness was shown the second line-up following the same procedure. Finally, participants were asked five questions about intergroup contact based on the questionnaire by Corenblum and Meissner (2006). The questions were:

- Do you have any Asian (or white) pupils at your school? If yes, how many?
- Do you have any Asian (or white) people who live near you? If yes, how many?
- Do you ever work/play with Asian (or white) people in school? If yes, how many?
- Do you ever work/play with Asian (or white) people outside school? If yes, how many?
- How many Asian (white) people do you know?

Table 2. The percentage of responses for the target present line-ups (frequencies are in parentheses).

Witness	Caucasian target			Asian target		
	Correct ID	Foil ID	Incorrect rejection	Correct ID	Foil ID	Incorrect rejection
Caucasian						
7–9 years	60.9 (28)	23.9 (11)	15.2 (7)	17.4 (8)	73.9 (34)	8.7 (4)
12–14 years	57.1 (24)	26.2 (11)	16.7 (7)	23.8 (10)	45.2 (19)	16.7 (7)
*Total	59 (52)	25.1 (22)	16 (14)	20.6 (18)	59.6 (53)	12.7 (11)
Asian						
7–9 years	42.4 (14)	24.2 (8)	33.3 (11)	35.9 (14)	35.9 (14)	28.2 (11)
12–14 years	40 (14)	31.4 (11)	28.6 (10)	33.3 (12)	25 (9)	41.7 (15)
Total	41.2 (28)	27.8 (19)	31 (21)	34.6 (26)	30.5 (23)	35 (26)

* Totals have been rounded up and so might be > 100%.

Following Corenblum and Meissner (2006), the scores for each question were calculated on a 5-point scale, 1 = never to 5 = more than 5. Finally, the total score for each participant was calculated by summing all the scores for all questions.

Results

Data for the TP and TA line-ups were analysed separately as eyewitness research (Wells, 1993) and face recognition (Megreya and Burton, 2007) showed consistently that performance on TP and TA conditions is unrelated. Furthermore, responses are different for each line-up.

Target present line-ups

Overall for the TP line-ups, 38.9% of participants correctly identified a target (correct ID), 36.7% incorrectly chose a foil from the line-up (foil ID) and 24.4% incorrectly rejected the line-up saying the target was not present. Table 2 shows the percentage of responses for both Caucasian and Asian witnesses for the Caucasian and Asian targets. A hierarchical loglinear analysis (HILOG) was conducted with witness ethnicity (Caucasian, Asian), witness age (child, adolescent), target ethnicity (Caucasian, Asian) and response (correct ID, foil ID and incorrect rejection) as factors. The likelihood ratio of the model was $\chi^2(12) = 12.24, p = .43$, there was a significant interaction for witness ethnicity, target ethnicity and response ($\chi^2(2, N = 319) = 9.27, p = .01$). The data were split and separate χ^2 tests for target ethnicity and response were carried out for the Caucasian and Asian witnesses. For Caucasian witnesses, there was a significant effect of target ethnicity ($\chi^2(2, N = 176) = 29.62, p < .001, \Phi = .41$), there were more correct identifications for the Caucasian target (59%) than the Asian target (20.5%), and there were more foil identifications for the Asian target (60.2%) than the Caucasian target (25%). For the Asian witnesses, there were no significant effects ($\chi^2(2, N = 143) = .65, p = .72$,

Table 3. The percentage of responses for the target absent line-ups (frequencies are in parentheses).

Witness	Caucasian target		Asian target	
	Correct rejection	False ID	Correct rejection	False ID
Caucasian				
7–9 years	37 (17)	63 (29)	19.6 (9)	80.4 (37)
12–14 years	66.7 (28)	33.3 (14)	40.5 (17)	59.5 (25)
Total	51.9 (45)	48.2 (43)	39.9 (26)	70 (62)
Asian				
7–9 years	43.6 (17)	56.4 (22)	42.4 (14)	57.6 (19)
12–14 years	52.8 (19)	47.2 (17)	57.1 (20)	42.9 (15)
Total	48.2 (36)	51.8 (39)	49.8 (34)	50.3 (34)

$\Phi = .07$), and responses were not significantly different for the Caucasian (41.2%) or Asian (34.6%) targets.

As an additional measure the responses for Line-up A (target position 4) and Line-up B (target position 6) were also analysed to determine whether there was any influence of the target's position in the line-up on identification. This was found to be non-significant ($\chi^2(2, N = 319) = 3.2, p = .2$)

Target absent line-ups

For the TA line-ups, 44.2% of participants correctly stated the target was not present (correct rejection) and 55.8% chose a member from the line-up (false ID). Table 3 shows the percentage of participants' responses for both age groups for the Caucasian and Asian targets. A HILOG was conducted with witness ethnicity (Caucasian, Asian), witness age (child, adolescent), target ethnicity (Caucasian, Asian) and response (correct rejection, false ID) as factors. The likelihood ratio of the model was ($\chi^2(6, N = 319) = 2.66, p = .85$), there was a significant interaction for witness ethnicity, target ethnicity and response ($\chi^2(1, N = 319) = 4.69, p = .03$), and for witness age and response ($\chi^2(1, N = 319) = 12.28, p < .001$).

Table 4. The percentage of choosing for both line-ups (frequencies are in parentheses.)

Witness	Did not choose	Chose on one line-up	Chose on both line-ups
Caucasian			
7–9 years	4.3 (4)	34.8 (32)	60.9 (56)
12–14 years	13.1 (11)	51.2 (43)	35.7 (30)
Total	8.7 (15)	43 (76)	48.3 (86)
Asian			
7–9 years	16.7 (12)	40.3 (29)	43.1 (31)
12–14 years	12.7 (9)	63.4 (45)	23.9 (13)
Total	14.7 (21)	51.9 (74)	33.5 (44)

To explore the interaction for witness ethnicity, target ethnicity and response, the data were split and separate χ^2 tests for target ethnicity and response were carried out for the Caucasian and Asian witnesses. For Caucasian witnesses, there was a significant effect of target ethnicity ($\chi^2 (1, N = 176) = 8.53, p = .004, \Phi = .2$), there were more correct rejections for the Caucasian target (51%) compared with the Asian target (29.5%), and there were more false identifications for the Asian target (70.5%) compared with the Caucasian target (48.9%). For the Asian witnesses, there were no significant effects ($\chi^2 (1, N = 143) = .06, p = .81, \Phi = .02$), and responses were not significantly different for the Caucasian (48.2%) or Asian target (49.8%).

The effect of witness age upon response, was also statistically significant ($\chi^2 (1, N = 319) = 12.21, p < .001, \Phi = .2$). Adolescent witnesses made more correct rejections (54.2%) compared with the child witnesses (34.8%) and children made more false identifications (65.2%) compared with adolescent witnesses (45.8%).

The responses for TA line-ups A and B were also analysed to determine whether there was any in differences in identification, according to line-up order. This was found to be non-significant ($\chi^2 (2, N = 319) = .02, p = .89$).

Choosers vs. non-choosers

The data for the TP and TA line-ups were collapsed to investigate overall choosing behaviour, the responses are shown in Table 4. A HILOG was conducted with witness ethnicity (Caucasian, Asian), witness age (child, adolescent) and choosing response (did not choose, chose on one line-up, chose on both line-ups) as factors. The likelihood ratio of the model was ($\chi^2 (3, N = 319) = 3.57, p = .31$), there was a significant interaction for witness ethnicity and choosing ($\chi^2 (2, N = 319) = 8.52, p = .014$), and for witness age and choosing ($\chi^2 (2, N = 319) = 17.26, p < .001$). A χ^2 test for witness ethnicity and choosing was found to be significant ($\chi^2 (2, N = 319) = 8.46, p = .015, \Phi = .16$), Caucasian

Table 5. The percentage of responses for the inter-racial contact questionnaire (frequencies in parentheses).

Witness	Total number of other-race persons known				
	None	1 or 2	3	4	5 or more
Caucasian	75. (132)	5.1 (9)	2.8 (5)	4.5 (8)	12.5 (22)
Asian	2.1 (3)	.7 (1)	3.5 (5)	2.8 (4)	90.8 (129)

witnesses were more likely to choose on both line-ups (48.9%) compared with Asian witnesses (33.6%) and Asian witnesses were more likely to not choose on either line-up (14.7%) compared with Caucasian witnesses (8.5%). An χ^2 test for witness age and choosing was found to be significant ($\chi^2 (2, N = 319) = 17.04, p < .001, \Phi = .23$), the younger age group were more likely to choose on both line-ups (53%) compared with the older age group (30.3%), whereas the older age group were more likely to choose on one line-up (56.8%) compared with the younger age group (37.2%).

Inter-racial contact

Following Corenblum and Meissner (2006) a measure of inter-racial contact was calculated for each witness from the sum of the responses from the inter-racial questionnaire, they are shown in Table 5. The χ^2 test for total contact and witness ethnicity was found to be significant ($\chi^2 (4, N = 319) = 205.54, p < .001, \Phi = .8$). Caucasian witnesses were significantly more likely to not know any Asians (75%), whereas very few Asians knew no Caucasians (2%). Most Asian children knew five or more Caucasians (90.8%), whereas very few Caucasian children knew five or more Asians (12.5%). In line with predictions, there was a significant correlation between the sum of the responses from the inter-racial contact questionnaire and correct identification of other-race faces for TP line-ups ($r (155) = .21, p = 0.008$). There was also a significant correlation for levels of contact and correct rejections for the TA line-ups ($r (153) = .18, p = 0.031$).

Discussion

The aim of this study was to investigate the ORB using an eyewitness paradigm, with Caucasian and Asian children and adolescents and to examine the effects of contact on ORB. Our first prediction for the TP line-ups was that because Caucasian participants are the majority race in the UK, they would exhibit an ORB and make more correct identifications for their own race, compared with the other-race target. This was found to be the case; Caucasian participants were significantly more accurate at correctly identifying the Caucasian target (59%) compared with the Asian target (20.5%). For the TA line-ups, we predicted

that the Caucasian participants would be more likely to falsely identify the Asian target compared with the Caucasian target. This prediction was also confirmed, as Caucasian participants were significantly more likely falsely to identify a member from the Asian line-up (70%) compared with someone from the Caucasian line-up (48.2%).

The ORB shown here for the Caucasian participants confirms previous face-recognition research that reports that people are better at recognizing their own race compared with other races, and that this effect is greater in Caucasian Europeans than for other racial groups (Hancock and Rhodes, 2008; Jackiw et al., 2008; Walker and Hewstone, 2006). Our findings also confirm those from previous eyewitness studies that have found that participants make more correct identifications for own-race targets from TP line-ups and more false identifications of other-race line-up members from TA line-ups (Jackiw et al., 2008; Smith et al., 2004).

Our second prediction was that because Asian participants are the minority race, they would exhibit no ORB and be equally good at identifying both races. This hypothesis was supported, Asian participants were equally accurate at identifying the Asian target (34.6%) and the Caucasian target (41%) in TP line-ups. Furthermore, for the TA line-ups, Asian participants also showed no ORB, and had similar false identification rates for the Asian (50.3%) and Caucasian (51.8%) line-ups. The finding that our Asian participants showed no ORB confirms previous research that has found that minority races do not show an ORB and recognize faces from another race equally to own-race faces, if the faces are from the majority race (Corenblum and Meissner, 2006; Cross et al., 1971, Feinman and Entwisle, 1976; Sporer et al., 2007). According to Sporer et al. (2007), the findings that our Asian participants do not exhibit an ORB like our Caucasian participants is due to asymmetric social interactions. That is, our minority members are likely to have more contact with majority members, than majority members have with persons in the minority group. This was confirmed by our measures of inter-racial contact.

Our third prediction was that measures of inter-racial contact might predict responses for identifying other-race targets. We found a significant correlation between the level of inter-racial contact and correct identification of the other-race target. Furthermore, the Asian participants had high levels of contact with Caucasians, whereas our Caucasian participants had low levels of contact with Asians. These findings appear to support the contact hypothesis which suggests that through high levels of contact with one's own race we become experts (Brigham and Malpass, 1985; Slone et al., 2000); however, having high levels of contact with other races can eradicate the ORB (de Herring

et al., 2010). We also found that higher levels of contact could help to reduce false identifications for TA line-ups, and this is an area that warrants further research.

However, not all research has found asymmetric patterns for the ORB. One study with children by Pezdek et al. (2003) found an ORB for both Caucasian and African American participants. This study used similar experimental stimuli to our study using a film of a staged event, although both targets (Caucasian and African American) were presented at the same time and not one at a time as in our study. Pezdek and colleagues line-up also used a six-person video line-up for their identification phase, however, in contrast to our own line-ups, each member walked into the room and stood facing the camera, rather than the head-and-shoulders video used in the present study. The participants in Pezdek et al.'s study also responded on a scale of 1 (absolutely sure this was not the target man) to 5 (absolutely sure this was the target man), rather than identifying a number from the line-up. Pezdek and colleagues found an ORB for both the Caucasian and African American participants, with both groups more accurate at identifying their own-race face. This could be due to experimental differences or due to different rates of inter-racial contact for the participants. Unfortunately, Pezdek and colleagues did not include measures of inter-racial contact, so we cannot determine whether differences in inter-racial contact are driving the effects.

Following previous research, we examined whether video line-ups may be beneficial at reducing false identifications from TA line-ups for the adolescent group. It was found that adolescents (54.2%) made significantly more correct rejections compared with the children (34.8%). This replicates previous research that reports video line-ups can reduce false identifications for TA line-ups compared with static line-ups for adolescent participants, but not for children (Havard et al., 2010). It may be that seeing a moving image allows a witness to view multiple angles of the face, and this information is better utilized by adolescents than children. Alternatively, Valentine et al. (2007) suggest that the additional information provided in the video may reveal distinctive features of a face that the witness does not remember, and this may lead to a decision that the face is not that of the culprit. All of this evidence points to the use of using video images for line-up identification, over static images.

As an additional measure we examined choosing rates, as these may reflect a tendency or bias to pick from a line-up regardless of memory quality. Caucasian participants were more likely to choose on both line-ups (48.9%) compared with Asian participants (33.6%), whereas Asian participants (14.7%) were more likely to not to choose on either line-up compared with the Caucasians (8.5%). This seems to show that Caucasians were less conservative in

their responses and more likely to pick a person from the line-up, whereas Asian participants appeared to be more cautious and less likely to choose someone from the line-ups. Younger participants were also more likely to choose from both line-ups (53%) compared with older participants (30.3%). This confirms previous research that has shown that younger children (aged 6–8 years) are more likely to choose from line-ups, compared with adults (Havard et al., 2011).

Although our results report some differences in accuracy for TA line-ups and differences in choosing rates as a function of age, there were no differences in ORB as a function of age. This confirms previous research that has found that there were no developmental differences in recognizing faces from different races (Corenblum and Meissner, 2006; Pezdek et al., 2003); however, it also contrasts with research that has shown that younger children can sometimes recognize faces of another race equally with own-race faces (Chance et al., 1982; Goldstein and Chance, 1980; Goodman et al., 2007). Studies that have found no ORB for younger children have employed face-recognition paradigms, as opposed to an eyewitness paradigm. These studies also do not report any inter-racial contacts measures that could be influencing the accuracy for other-race faces.

There is a limitation of this study that should be considered, the line-ups for both races were constructed by a Caucasian policeman and a Caucasian researcher. Although research has shown that video line-ups show no difference in the fairness as a function of the ethnic origin of the line-up members (Valentine et al., 2003) some other laboratory studies suggest that the ORB can influence the construction of the line-up. Brigham and Ready (1985) tasked a group of Afro-Caribbean and Caucasian participants to select five foils that were similar in appearance to a target photo, a task similar to that when constructing a line-up. They found that both groups went through more photos when looking for own-race matches than when looking to match the foils to the other-race target. They also used a stricter criterion for similarity for the own-race photos. Several other studies have found that race can influence the fairness of line-ups (Brigham et al., 1990; Lindsay et al., 1999), and Brigham et al. (2007) suggest that line-ups should be constructed by operators who are the same race as the suspect, to increase fairness and remove any bias. A further limitation is the use of a single target for the Asian and the Caucasian perpetrator, which might limit the generalizability of findings (Wells and Windschitl, 1999). Additionally, when using only one target and line-up for each group it could be argued that one line-up might be easier than another which could influence responses. Future research should ensure that there are several targets for each experimental category to prevent any target effects.

To conclude, our findings suggest that contact may be a mechanism underlying ORB. Caucasian participants who had low levels of contact with Asians showed a significant ORB, whereas Asians who had high levels of contact with Caucasians showed no ORB. The level of inter-racial contact was positively correlated with correct identification for the other-race target for TP line-ups and correct rejections for the other-race target for TA line-ups. Future research investigating the ORB should examine further how quality of contact with other races together with other factors such as length of exposure to the face may influence accuracy. Furthermore, for real criminal investigations, levels of inter-racial contact should be considered when suspect is a different race to the witness.

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Notes

1. In this study, only one target face was used for each race. In face-recognition research, participants would be presented with several faces for each race and a large number of faces where they have to decide which ones are 'old' and which ones are 'new'. However, in the eyewitness paradigm the aim is to simulate the situation of a witness viewing one (or two) suspect(s) and then trying to identify them later from a line-up. A few other studies using the eyewitness paradigm to examine the ORB have also used only one target face per race (Brigham et al., 1985; Kask and Bull, 2009; Pezdek et al., 2003).
2. VIPER video identification procedure electronic recording, is one of the most commonly used methods for line-up identification in the UK.

References

- Bar-Haim Y, Ziv T, Lamy D and Hodes RM (2006) Nature and nurture in own-race face processing. *Psychological Science* 17: 159–163. doi: 10.1111/j.1467-9280.2006.01679.x.
- Beal CR, Schmitt KL and Dekle DJ (1995) Eyewitness identification of children: effects of absolute judgements, nonverbal response options and event encoding. *Law and Human Behavior* 19: 197–216.
- Bothwell RK, Brigham JC and Malpass RS (1989) Cross-racial identifications. *Personality and Social Psychology Bulletin* 15: 19–25. doi: 10.1177/0146167292183005.
- Brigham JC and Malpass RS (1985) The role of experience and context in the recognition of own- and other-race persons. *Journal of Social Issues* 4: 139–155.

- Brigham JC and Ready DJ (1985) Own-race bias in lineup construction. *Law & Human Behavior* 9: 415–424. doi: 10.1007/BF01044480.
- Brigham JC, Bennett LB, Meissner CA and Mitchell TL (2007) The influence of race on eyewitness memory, in Lindsay R, Ross D, Read J and Toglia M (eds) *Handbook of Eyewitness Psychology: Memory for People*. Mahwah, NJ: Erlbaum, pp. 257–281.
- Brigham JC, Ready DJ and Spier SA (1990) Standards for evaluating the fairness of photograph lineups. *Basic and Applied Social Psychology* 11: 149–163. doi: 10.1207/s15324834baspl102_3.
- Ceci SJ, Ross DF and Toglia MP (1987) Suggestibility of children's memory: psycholegal implications. *Journal of Experimental Psychology: General* 116: 38–49.
- Chance JE, Turner AL and Goldstein AG (1982) Development of differential recognition for own- and other-race faces. *Journal of Psychology* 112: 29–37.
- Corenblum B and Meissner CA (2006) Recognition of faces of ingroup and outgroup children and adults. *Journal of Experimental Child Psychology* 93: 187–206. doi:10.1016/j.jecp.2005.09.001.
- Cross JF, Cross J and Daly J (1971) Sex, race, age, and beauty as factors in recognition of faces. *Perception & Psychophysics* 10: 393–396.
- De Herring A, de Liedekerke C, Deboni M and Rossion B (2010) The role of experience during childhood in shaping the other-race effect. *Developmental Science* 13: 181–187. doi: 10.1111/j.1467-7687.2009.00876.
- Farah MJ, Tanaka JW and Drain HM (1995) What causes the face inversion effect? *Journal of Experimental Psychology: Human Perception and Performance* 21: 628–634.
- Farah MJ, Wilson KD, Drain HM and Tanaka JW (1995) The inverted face inversion effect in prosopagnosia: evidence for mandatory, face-specific perceptual mechanisms. *Vision Research* 35: 2089–2093. doi:10.1016/0042-6989(94)00273-O.
- Farah MJ, Wilson KD, Drain M and Tanaka JW (1998) What is 'special' about face perception? *Psychological Review* 105: 482–498.
- Feinman S and Entwisle DR (1976) Children's ability to recognize other children's faces. *Child Development* 47: 506–510.
- Fitzgerald RJ and Price HL (2015) Eyewitness identification across the life span: a meta-analysis of age differences. *Psychological Bulletin* 141: 1228–1265.
- Goldstein AG and Chance JE (1980) Memory for faces and schema theory. *Journal of Psychology* 105: 47–59.
- Goodman GS, Sayfan L, Lee JS, Sandhei M, Walle-Olsen A, Magnussen S, et al. (2007) The development of memory for own- and other-race faces. *Journal of Experimental Child Psychology* 98: 233–242. doi:10.1016/j.jecp.2007.08.004.
- Gross J and Hayne H (1996) Eyewitness identification by 5-to 6-year-old children. *Law and Human Behavior* 20: 359.
- Hancock KJ and Rhodes G (2008) Contact, configural coding and the other-race effect in face recognition. *British Journal of Psychology* 99: 45–56. doi: 10.1348/000712607X199981.
- Havard C (2014) Are children less reliable at making visual identifications than adults? A review. *Psychology, Crime and Law* 20: 372–388.
- Havard C (2017) Children's face identification ability, in Bindemann M and Megreya A (eds) *Face Processing: Systems, Disorders and Cultural Differences*. New York: Nova, pp. 255–272.
- Havard C and Memon A (2009) The influence of face age on identification from a video line-up: A comparison between older and younger adults. *Memory* 17: 847–859. doi: 10.1080/09658210903277318.
- Havard C, Memon A, Clifford B and Gabbert F (2010) A comparison of video and static photo lineups for child and adolescent witnesses. *Applied Cognitive Psychology* 24: 1209–1221. doi: 10.1002/acp.1645
- Havard C, Memon A, Laybourn P and Cunningham C (2011) Own age bias in video lineups: a comparison between children and adults. *Psychology, Crime & Law* 18: 929–944.
- Hayward WG, Rhodes G and Schwaninger A (2008) An own-race advantage for components as well as configurations in face recognition. *Cognition* 106: 1017–1027. doi:10.1016/j.cognition.2007.04.002.
- Hugenberg K, Miller J and Claypool HM (2007) Categorization and individuation in the cross-race deficit: Toward a solution to an insidious problem. *Journal of Experimental Social Psychology* 43: 334–340. doi:10.1016/j.jesp.2006.02.010.
- Innocence Project (2010) *Innocence Project Case*. Available at: <http://www.innocenceproject.org/know/> (accessed 4 August 2010).
- Jackiw LB, Arbuthnott KD, Pfeifer JE, Marcon JL and Meissner CA (2008) Examining the cross-race effect in lineup identification using Caucasian and First Nations samples. *Canadian Journal of Behavioural Science* 40: 52–57.
- Kask K and Bull R (2009) The effect of different presentation methods on multi-ethnicity face recognition. *Psychology, Crime & Law* 15: 73–89. doi: 10.1080/10683160802131131.
- Kelly DJ, Liu S, Ge L, Quinn PC, Slater AM, Lee K, Liu Q and Pascalis O (2007) Cross-race preferences for same-race faces extend beyond the African versus Caucasian contrast in 3-month-old infants. *Infancy* 11: 87–95. doi: 10.1207/s15327078in1101_4.
- Levin DT (1996) Classifying faces by race: the structure of face categories. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 22: 1364–1382.
- Levin DT (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. doi: 10.1037/S0096-3445.129.4.559.
- Lindsay RCL, Ross DF, Smith SM and Flanigan S (1999) Does race influence measures of lineup fairness? *Applied Cognitive Psychology* 13: 109–119.

- Lord Advocates' Guidelines (2007) *The Conduct of Visual Identification Procedures*. Available at: <http://www.copfs.gov.uk/Resource/Doc/13547/0000269.pdf> (accessed 5 October 2007).
- Megreya AM and Burton AM (2007) Hits and false positives in face matching: a familiarity-based dissociation. *Perception and Psychophysics* 69: 1175–1184.
- Meissner CA and Brigham JC (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. doi: 10.1037/1076-89/1.7.1.3
- Meissner CA, Brigham JC and Butz DA (2005) Memory for own- and other-race faces: a dual-process approach. *Applied Cognitive Psychology* 19: 545–567. doi: 10.1002/acp.1097.
- Michel C, Caldara R and Rossion B (2006) Same-race faces are perceived more holistically than other-race faces. *Visual Cognition* 14: 55–73. doi: 10.1080/13506280500158761.
- Michel C, Rossion B, Han J, Chung C-S and Caldara R (2006) Holistic processing is finely tuned for faces of our own race. *Psychological Science* 17: 608–615. doi: 10.1111/j.1467-9280.2006.01752.x.
- Pezdek K, Blandon-Gitlin I and Moore C (2003) Children's face recognition memory: more evidence for the cross-race effect. *Journal of Applied Psychology* 88: 760–763. doi: 10.1037/0021-9010.88.4.760.
- Police and Criminal Evidence Act (1984) Codes of Practice (2008) Available at: <http://police.homeoffice.gov.uk/operational-policing/powers-pace-codes/pace-code-intro/> (accessed 1 April 2009).
- Pozzulo JD and Lindsay RCL (1997) Increasing correct identifications by children. *Expert Evidence* 5: 126–132.
- Pozzulo JD and Warren KL (2003) Descriptions and identifications of strangers by youth and adult eyewitnesses. *Journal of Applied Psychology* 88: 315.
- Rhodes G, Brake S, Taylor K and Tan S (1989) Expertise and configurational coding in face recognition. *British Journal of Psychology* 80: 313–331.
- Rhodes G, Hayward WG and Winkler C (2006) Expert face coding: configural and component coding of own-race and other-race faces. *Psychonomic Bulletin & Review* 13: 499–505.
- Roberts-Thomson T (2009) *The Demographics of Leicester*. Available at: <http://www.leicester.gov.uk/EasySiteWeb/GateWayLink.aspx?allId=52551> (accessed 20 August 2010).
- Sangrigoli S and de Schonen S (2004) Recognition of own-race and other-race faces by three-month-old infants. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 45: 1219–1227. doi: 10.1111/j.1469-7610.2004.00319.x.
- Sangrigoli S, Pallier C, Argenti AM, Ventureyra VAG and de Schonen S (2005) Reversibility of the other-race effect in face recognition during childhood. *Psychological Science* 16: 440–444. doi: 10.1111/j.0956-7976.2005.01554.x.
- Shapiro PN and Penrod S (1986) Meta-analysis of facial identification studies. *Psychological Bulletin* 100: 139–156. doi:10.1037/0033-2909.100.2.139.
- Slone AE, Brigham JC and Meissner CA (2000) Social and cognitive factors affecting the own-race bias in Whites. *Basic & Applied Social Psychology* 22: 71–84.
- Smith SM, Stinson V and Prosser MA (2004) Do they all look alike? An exploration of decision-making strategies in cross-race facial identifications. *Canadian Journal of Behavioural Science* 36: 144–153.
- Sporer S (2001) Recognizing faces of other ethnic groups: an integration of theories. *Psychology, Public Policy, and Law* 7: 36–97. doi: 10.1037/1076-8971.7.1.36.
- Sporer SL, Trinkl B and Guberova E (2007) Matching faces: differences in processing speed of out-group faces by different ethnic groups. *Journal of Cross-Cultural Psychology* 38: 398–412. doi: 10.1177/0022022107302310.
- Tanaka JW and Farah MJ (1993) Parts and wholes in face recognition. *Quarterly Journal of Experimental Psychology A* 46: 225–245.
- Tanaka JW and Farah MJ (2003) The holistic representation of faces, in Peterson MA and Rhodes G (eds) *Perception of Faces, Objects, and Scenes: Analytic and Holistic Processes*. New York, NY: Oxford University Press, pp. 21–47.
- Tanaka JW, Kiefer M and Bukach CM (2004) A holistic account of the own-race effect in face recognition: evidence from a cross cultural study. *Cognition* 93: B1–B9. doi:10.1016/j.cognition.2003.09.011.
- Valentine T, Darling S and Memon A (2007) Do strict rules and moving images increase the reliability of sequential identification procedures? *Applied Cognitive Psychology* 21: 933–949. doi: 10.1002/acp.1306.
- Valentine T, Harris N, Colom Piera A and Darling S (2003) Are police video identifications fair to African-Caribbean suspects? *Applied Cognitive Psychology* 17: 459–476.
- Walker PM and Hewstone M (2006) A perceptual discrimination investigation of the own-race effect and intergroup experience. *Applied Cognitive Psychology* 20: 461–475. doi: 10.1002/acp.1191.
- Waterman AH, Blades M and Spencer C (2000) Do children try to answer nonsensical questions? *British Journal of Developmental Psychology* 18: 211–225.
- Wells GL (1993) What do we know about eyewitness identification? *American Psychologist* 48: 553–571.
- Zajac R and Karageorge A (2009) The wildcard: a simple technique for improving children's target-absent lineup performance. *Applied Cognitive Psychology* 23: 358–368.

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Amina Memon is internationally recognised for her work and her findings have had a considerable impact in the field. Her studies of cognitive techniques in investigations since the 1990s have highlighted the importance of training in interviewing skills in evidence gathering. She has devoted time and energy both to the development and dissemination of training to practitioners and this is one of the reasons why her research continues to attract external research funds. She has enriched her work by drawing upon theories from social psychology and social cognition. Prof Memon has worked with different participant groups including children, adults, seniors, police officers and judges.

Memon has research collaborators in Brazil, Germany, the Netherlands, North America and Finland. Current projects include work on memory and decision-making, detection of deception, and credibility assessment. Prof Memon has received numerous awards to support her research and has over 100 publications. She has been contributing to professional development and training since 1995. She is a Fellow of the British Psychological Society, the Association for Psychological Science and the Royal Society of Arts.

Joyce E. Humphries is a Senior Lecturer in the Department of Psychology at Edge Hill University. Her main research interests lie in the integration of both cognitive psychology and social psychology and its interface with law. Her research interests focus on the theoretical and applied aspects of memory and cognition, specifically the study of cognitive and social psychological factors that influence memory accuracy across the lifespan. She has conducted research on investigative techniques, line-up identification procedures and the effects of alcohol on memory for traumatic events. Recent research also includes investigating the biases associated with juror and jury decision making.