Categorization of Faces: Salient Characteristics of Own- versus Other-Race Faces

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INTRODUCTION

Although facial processing is automatic and intuitively seems simple, research in cognitive and forensic psychology indicates that facial recognition is impaired by many factors including cross-race recognition and verbal overshadowing. To examine the basis of facial similarity judgment across races, White and First Nations participants sorted photographs of White and First Nations faces into unconstrained categories.

METHOD

7 undergraduate participants (6 men, 1 woman), all between 18 and 25 years old.

362 photos (181 White, 181 First Nations) were taken with a digital camera under similar conditions then processed using Adobe Photoshop to remove as much background variation as possible. The photos were printed on letter paper with a colour printer, trimmed, and then laminated for this study.

Participants were asked to sort the photographs into piles of similar faces. They were not allowed to change their decisions once a photograph was placed in a pile. After sorting, the participant was asked to describe the contents of each pile and the contents of each pile and its description was recorded. Participants took ~45 minutes to complete the task.

Participant	Number of Piles	Average per Pile	Standard Deviation
1	22	16.45	8.25
2	18	20.11	13.88
3	38	9.53	7.90
4	10	36.2	26.75
5	33	10.97	8.65
6	38	9.53	11.35
7	24	15.08	13.68

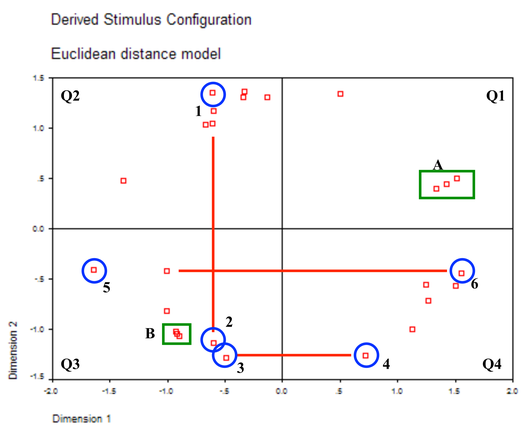
ANALYSIS

From the list of piles for each participant, the distance between each pair of photos was determined in the following way:

0 ***if pair of photos in same pile***
1 ***if pair of photos not in same pile***

With 362 photos, there were 65,341 different pairs of photos. The total distance for each pair was calculated by summing the distance determinations (either 0 or 1) for each participant. A total distance of **0** meant that *all* participants placed the pair in the same pile. A total distance of **7** meant that *none* of the participants placed the pair in the same pile.

The smallest total distance for any pair in this study was 2, which occurred for 14 pairs (5 of the 7 participants placed the pair in the same pile). 26 individual photos were involved in these pairs (2 were repeated). Multidimensional scaling analysis (MDS) was performed (in SPSS) for these photographs, with the results illustrated below.



DISCOVERING DIMENSIONS

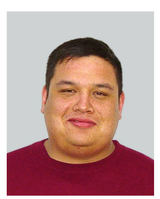
The following pairs are indicated by the blue circles on the preceding plot. Their position on the plot varies in only 1 of the 2 dimensions. How do they differ? Below each photo are some of the descriptions of the piles to which these photos were assigned.

1   2

1: big, round face; eyes; expression; skin; older; native; heavy
2: hair; face shape; square features; eyes; big chin

3   4

3: eyes; eyebrows; stare, broad face with pronounced chin; hair
4: wide dark eyes; eyebrows; round faces; nose; lips; ears; thin

5   6

5: deeply set eyes; eye shape; native; square jaw; heavy
6: hair; smooth face; native; younger; lips; smaller-head

SIMILARITIES

The following groups appear close together in the MDS analysis. Would you say that they are similar?

A

B

DISCUSSION AND FUTURE WORK

The MDS analysis yielded the following distribution: in Q1, 3 First Nations (FN) and 1 White (W); in Q2, 7 FN and 1 W; in Q3, 1 FN and 7 W; and in Q4, 2 FN and 4 W. Although this may indicate a trend, more data is needed. After recruiting more participants for this study, we will use the results to guide selection of small subsets (of 8 photos) to use in repertory grid studies augmented with eye-tracking data.

Acknowledgements: Syed Ali Abbas Rizvi, Tim Maciag, Jennifer Hepting, and Kim McConnell provided invaluable assistance with this poster.

Funded by NSERC discovery grants to:
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