Faces or Objects: Which are More Memorable?

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Abstract

The aim of the present study was to investigate whether human faces were more accurately recognized than detailed non-living objects when they were presented in color across various categories. We hypothesized that faces of various races, ages, and genders would be recognized at higher rates than detailed non-living objects possibly due to an adaptive or social advantage because people embody a greater potential for threat and reward. To test this, we used a counterbalanced randomized within-subjects repeated measures design in which participants watched a video consisting of 20 trials. The participant was asked to indicate whether or not a probe image was recalled as an exact match to one of the images from the study slide in that trial. The results revealed that faces were recognized at a higher rate than detailed non-living objects.

Introduction

The present study is concerned with whether or not faces of various race, age and gender have an advantage over detailed non-living objects in a recognition task. Past research by other authors showed mixed results on whether or not faces had a recognition advantage over objects. Kajimura, Himichi and Nomura (2014) found that performance on a memory task was enhanced when beautiful faces were used as a reward. Jackson and Raymond (2008) tested recognition rates for faces and objects and found an advantage for simple objects over faces. This result was explained by Curby and Gauthier (2007) who found a recognition for faces over complex objects at longer encoding times (4 seconds) which allowed for holistic processing. Meinhardt-Injac, Persike, and Berti (2013) also studied the N170 component and visual working memory (VWM) and found an advantage for faces over complex objects. However, none of these studies explored the recognition rates of faces of various races, ages, and genders and compared them to the recognition rates of detailed non-living objects to see if faces in general have a recognition advantage over detailed non-living objects which is the aim of our current study. We hypothesis that faces of various race, age and gender will be recognized at higher rates than detailed non-living objects when tested in a recognition task.

Methods

Participants: Thirty-five participants (8 males, 27 females) aged 18 to 64 years old were recruited from Facebook posts and undergraduate psychology courses.

Materials: Participants used their personal computers, and obtained a piece of paper and a writing utensil to record their answers. An online survey at surveymonkey.com was set up to collect participant's answers to the trials and their demographic information. Three YouTube videos were created for the study. The first video was a consent video which directed participant's to the appropriate experimental condition according to their birth month. The second and third videos were the experimental condition videos 1 and 2 respectively and each contained 20 trials consisting of a study slide, a simple math distracter task slide, and a probe slide which contained either a similar image or an exact match to an image previously seen on the study slide. Images were presented in color. Face images were of various races, ages, and genders. Object images were from the categories of tools, machinery, monuments, shoes, grandfather clocks, and office equipment.

Procedure and Design: Participants were tested in a randomized within-subjects repeated measures design that was counterbalanced across two experimental conditions. All participated by watching YouTube videos. They viewed a study slide for 5 seconds which contained color images of either faces or objects, then completed an intervening distractor task of simple math problems before being shown a probe slide of a single image and asked to indicate whether or not the object or face was from the previous study slide. They wrote Y (yes) or N (no) on their paper for each trial. They were then asked to record their written answers into the online survey.

Results

We analyzed our data with an analysis of variance (ANOVA) and found that faces were recognized at a significantly higher rate than detailed non-living objects, $F(1, 34) = 4.39$, $p. < 0.05$. See Figure 1. A follow up t test confirmed faces ($M = 7.57$, $SD = 1.4$) were recognized significantly more than objects ($M = 6.89$, $SD = 1.49$), $t(34) = 2.09$, $p < 0.05$.

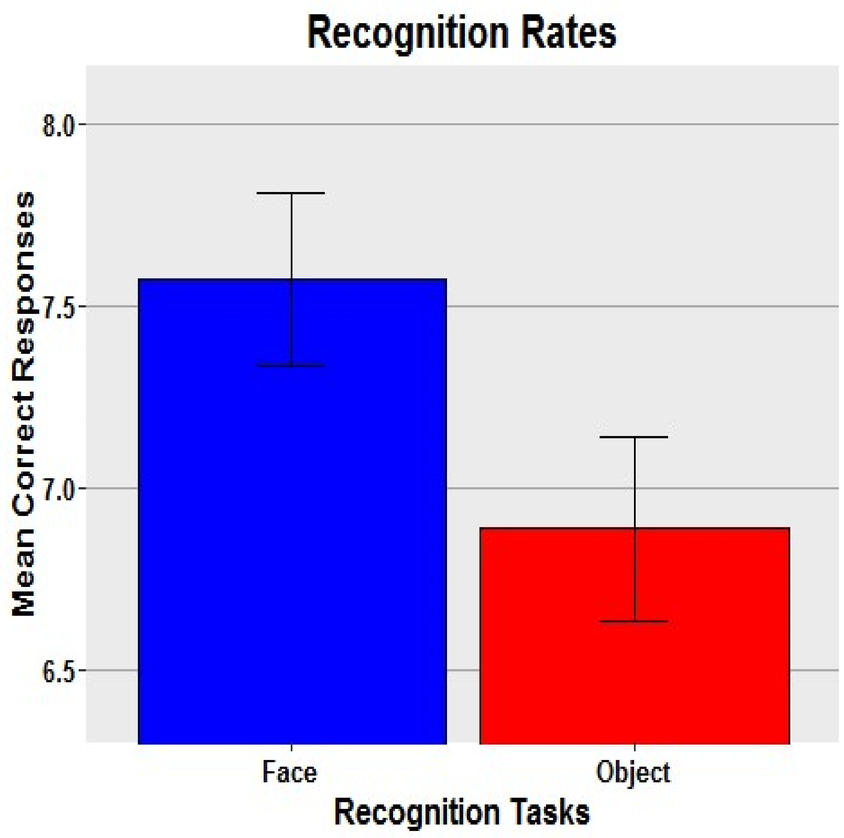

Figure 1: **The mean correct responses for the face recognition and object recognition tasks. Error bars denote 95% confidence limits on the basis of the standard errors of measurement.**

Summary

We hypothesized that faces of various races, ages, and genders would be recognized at higher rates than detailed non-living objects when presented in a series of recognition tasks. The results confirmed our hypothesis and showed that faces were recognized at a significantly higher rate than objects. We suggest that this may be because of an adaptive and/or social advantage for faces due to the higher potential for threat and reward found in humans over objects which makes facial recognition more important to survival and achieving social goals than object recognition.

Discussion

Our results confirmed our hypothesis and showed a facial recognition advantage when the recognition rates of faces of various races, ages, and genders were tested against the recognition rates of various detailed non-living objects. The facial recognition advantage might facilitate survival and social goals due to the greater potential for threat and reward found in people over objects. The social rewards of seeing a face previously found in research (Kajimura, et al., 2014) might have lead to higher facial recognition in our study. As may have face specific biological responses which have been found in the brain (Chan, 2013; Eimer, 2011; Meinhardt-Injac, et al., 2013).

Our study differed from previous research in several ways in order to better represent environmental experience. Based upon the research by Curby & Gauthier (2007), we used a longer encoding time in our study (5 seconds). We felt that this was a better representation of environmental experience where objects and faces are often viewed for longer than 1 or 2 seconds. Additionally, all items were presented in color rather than grayscale because that is how the majority of us view the world. We used faces of various races, ages, and genders because we experience a variety of faces in our lives. Additionally, we wanted to mediate for any same race recognition advantage for faces which had been found by previous research (Lucas, et al., 2011) We used several categories of detailed non-living objects because we encounter a wide variety of objects in our everyday lives. The finding of a recognition advantage when using stimuli which is similar to environmental experience is important to our understanding of a possible adaptive and/or social advantage for face recognition over object recognition since we would expect to find such an advantage when using a wide array of environmentally relevant stimuli if one did indeed exist. We suggest that a facial recognition advantage might be due to the greater potential for threat and reward of humans which makes facial recognition more important socially and for survival than object recognition which is why it occurs at a higher rate.

Limitations: We used Facebook to recruit participants which was very time consuming and we had no way to verify participants were actually over 18 years of age. Also participants recorded their own answers to the trials and were trusted to follow instructions (i.e.: Do not rewind this video). Mistakes or noncompliance may have affected our results. Further studies could use a laboratory to prevent these issues.

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