

MOST SIMILAR IS DIFFERENT: RESPONSE BIAS IN LINEUPS

Michael S. Wogalter and Dean G. Jensen

Department of Psychology
Rice University
Houston, Texas 77251

ABSTRACT

Previous research has shown that distractor faces made up of features of previously seen target faces are more likely to be selected as targets than the targets themselves. The present experiments sought to determine whether there is a tendency to pick a face out of a lineup if the face is more similar to the other lineup members than they are to each other. In Experiment 1, 25 subjects ranked members of lineups on similarity to target faces. The important comparisons were between rankings of the faces similar to the distractors (the critical faces), target faces, and other distractors. When the target faces were present in the lineup, no significant difference between rankings of the targets and the critical faces was found. When no targets were present in the lineup the critical faces were judged to be more like the targets than were the other distractors. This latter finding was replicated in Experiment 2 using visual stimuli other than faces. Implications for choosing police lineups are discussed.

INTRODUCTION

Law enforcement agencies often choose members of a police lineup to have features similar to those of the suspect so as to insure that the suspect is not the only member of the lineup that has a particular characteristic. For example, if a suspect were the only Oriental member of a lineup and the criminal were Oriental, the witness would not consider any of the other lineup members.

Choosing lineup members to be similar to the suspect may make a suspect stand out since by being more similar to the other members than the other members are to each other, the suspect is, at least in this sense, unique. It may be that being so similar to the other members increases the chance of being chosen by a witness. Some support for this notion can be found in a study by Solso and McCarthy (1981). Using a recognition memory paradigm these investigators constructed distractor faces from the features of faces that had been presented. Their subjects were more confident in recognizing (incorrectly) the distractor faces than the faces they had seen.

The present research sought to determine whether being similar to each of the other distractors would have an effect comparable to being similar to each of the previously seen targets. Specifically, is there a tendency for witnesses to choose a lineup member who closely resembles the other lineup members.

Experiment 1 tested whether a face that is more similar to the other lineup members than the other lineup members are to each other is perceived as: (a) more similar to the target than the target itself when the target is present in the lineup and (b) more similar to the target than expected by chance when the target is not present in the lineup.

EXPERIMENT 1

Experiment 1 used a recognition memory paradigm to study memory for faces. On each trial subjects were shown a target face, given a distractor task, and then asked to rank the members of a lineup in terms of their similarity to the target.

Method

Subjects. The subjects were 25 undergraduate students at Rice University.

Stimuli and Design. The faces were likenesses reproduced from the 1960 edition of the Identi-Kit facial reproduction system. They consisted of six features: hair, eyes, eyebrows, jaw, lips, and nose. As can be seen in Figure 1, the faces presented in the lineups had two different variations of each feature except the nose which was the same for all the lineup faces. The face in the upper left hand corner of Figure 1 had the larger versions of the eyebrows, eyes, lips, and chin and the smaller (or shorter) version of the hair.

The features that varied between: (a) the target faces subsequently presented in the lineups (lineup target faces), (b) the faces more like the other members of the lineup than the other members were like each other (critical faces), and (c) the other lineup members (distractors), were rotated through the faces and the lineups and balanced across all subjects. The target face that was not subsequently presented in the lineup (non-lineup target) had no features in common with the lineup target faces, the critical faces, or the distractor faces. All faces except the non-lineup target face were subsequently presented in the lineups.

Each distractor face differed from each other distractor face in the lineup by two features. The critical face differed by a single feature from all the

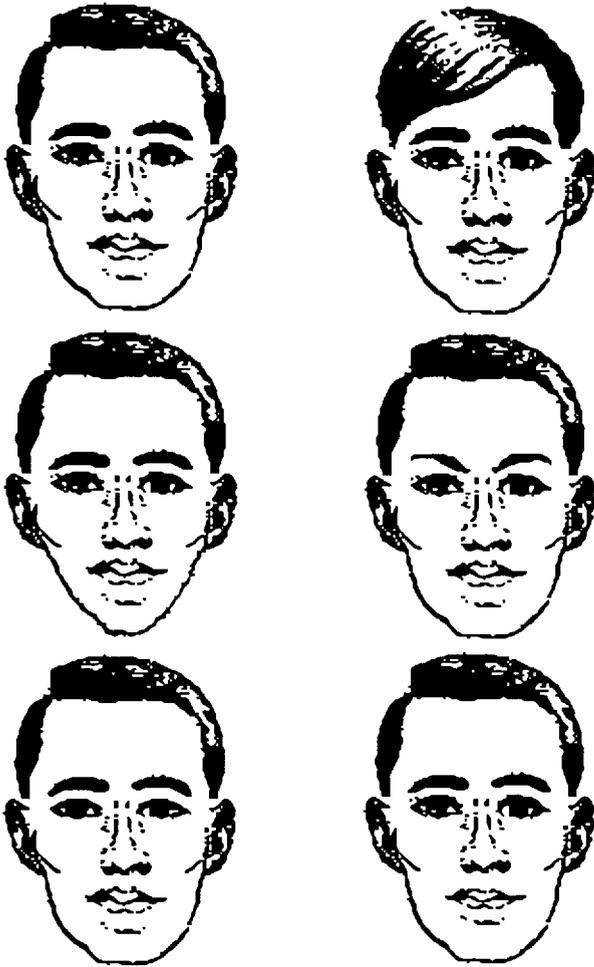


Figure 1. Sample lineup of faces in Experiment 1

other faces in the lineup. Lineup targets differed from the critical face by one feature and all the other distractor faces by two features.

Each lineup consisted of a critical face and either: a) the lineup target and four distractors or b) five distractors. Figure 1 shows a sample lineup, the critical face is in the upper left hand corner.

There were five different targets and five lineups for each target. Each lineup contained a different critical face. Subjects viewed four of the five lineup targets each under one of four durations: 17 ms, 2 s, 4 s, or 16 s. Instead of the fifth lineup target, they saw the non-lineup target for 17 ms. This was the target-absent condition. The exposure durations were rotated so that each group of five subjects saw a particular lineup target for a different duration. The orders of the exposure durations were rotated so that the orders were balanced between the groups of five subjects. Within each group of five subjects each subject had a different lineup for the same target. The targets were presented individually on an Apple Macintosh 512k microcomputer. Subjects were tested individually.

Procedure. Subjects were told that they were going to be tested in two ways, one involving memory

for people's faces and the other involving verbal problem solving. The experimenter then showed subjects some of the subtle differences between the facial features that could be expected. These features were presented individually rather than in the context of faces. It was emphasized that the faces would be very similar so that they needed to pay very close attention. On each trial subjects were told to look at the computer screen and indicate when they were ready. The experimenter then pressed a key that initiated the presentation of the target face.

Immediately after each presentation of the target in the study phase, subjects worked for three minutes on sets of 10 anagram problems in order to control for possible short-term visual memory effects. Subjects were told that this task was designed to assess the difficulty of various kinds of word constructions but it was only a distractor activity.

After the distractor activity, subjects viewed a lineup that contained six faces: the target face (if it had been shown), the critical face, and four (or five) distractor faces. Four of the five lineups for a given subject contained the target. The lineup that did not contain the target was presented in the target-absent condition. The lineups were assembled in a booklet and were preceded by an anagram test sheet and two sheets of blank white paper to prevent the lineup from being seen through the anagram sheet. Subjects were instructed to give rankings to each of the six lineup faces from one to six where one was most like the target and six was least like the target.

Results and Discussion

The mean rankings for the critical faces and the targets are shown in Table 1. A lower ranking indicates the face was perceived as more like the face presented at study. As expected, increased exposure of the target face at study produced better recognition of the target, $F(3,72) = 4.78, p < .01$. There was no effect of target presentation time on the rankings of the critical face $F(4,96) = 1.31, p = .27$. Although the critical faces in the lineup received better rankings than the targets when the targets had been seen for 17 ms or 2 s, there was no significant difference between the rankings of the targets and the critical faces, $F(1,24) < 1$, nor did the difference between the rankings of the targets and the critical faces change significantly with time, $F(3,72) = 1.50, p = .22$.

Table 1
Mean ranking scores for Target and Critical Faces. Lower scores indicate greater perceived resemblance to the target face.

Target Exposure	Target	Critical Face
(Target-Absent Condition)		2.52
17 ms	3.28	2.84
2 s	2.64	2.32
4 s	1.80	2.48
16 s	1.80	2.20

Therefore, these data provide little or no support for the thesis that a face more similar to the other faces of a lineup than the other faces are to each other would be perceived as more similar to the target than the target itself when the target is present in the lineup.

The most interesting result came from the comparison of the mean ranking of the critical faces with the ranking expected by chance. The mean ranking of the critical faces in the target-absent condition was less than the ranking of 3.5 expected by chance, $t(24) = 4.69$, $p < .001$. This result demonstrates that when a target is not present in the lineup the face more similar to the other faces than the other faces are to each other will be ranked as being more similar to the target than would be expected by chance.

EXPERIMENT 2

The purpose of Experiment 2 was to replicate the effect found in the target-absent condition of Experiment 1 and determine if it would generalize to other visual stimuli.

Method

Subjects. The subjects were 24 undergraduate students at Rice University.

Stimuli. The stimuli for this experiment were taken from the Matching Familiar Figures Test which was developed by Kagan (Kagan, 1965; Kagan, Pearson, & Welch, 1966). They were lineups of common items -- line drawings of objects such as airplanes, leaves, houses, and lamps. Fifteen lineup sets were selected from the Matching Familiar Figures Test. Each lineup contained a critical item which differed from each of the other members by one feature. Each of the other items in the lineup differed from each of the other items by two features. A sample lineup is shown in Figure 2. The critical item of the lineup in Figure 2 is on the right side of the middle row. There were 15 non-lineup targets, one for each lineup. Each non-lineup target was only globally related to the lineup members and differed by several features from all the lineup members shown at test. The targets and non-lineup targets were presented on an Apple Macintosh 128K computer.

Design and Procedure. The subjects viewed each target item under one of three presentation conditions: they viewed a non-lineup target item for 17 ms, or they viewed a lineup target for 2 s, or 16 s. The only condition of interest was the 17 ms presentations of the non-lineup targets (the target-absent condition). The presentations of the lineup targets were only included to suggest to the subjects that all the targets could be expected to appear in the lineups.

The target presentation order was the same for all subjects. The order of the time conditions was

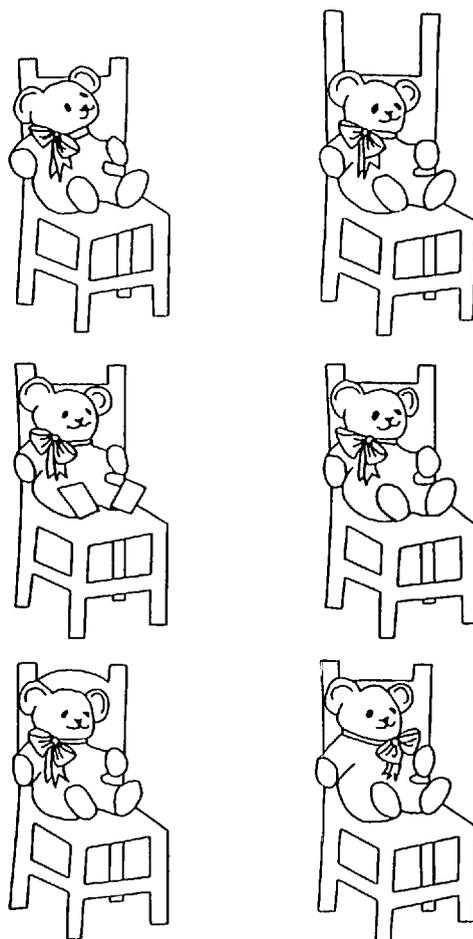


Figure 2. Sample lineup of figures in Experiment 2

balanced using a Latin square design. Eight subjects were in each time order group. Subjects received five pictures in each time condition for a total of 15 target items and lineups. Subjects saw lineup targets in two of the three target presentations. In the target-absent condition they saw the non-lineup target. All lineups were viewed by all subjects, and all the lineups were balanced through each of the time conditions across subjects.

When the experiment began, subjects were told that they were being tested for their ability to remember simple line drawings. They were told that they would be presented with individual pictures on the computer and to pay very close attention because some of the pictures would be shown for a very short period of time.

After viewing each computer presentation of a lineup or non-lineup target, subjects viewed a lineup of items and were instructed to rank order them from one to six where one meant the picture was most similar to the target shown on the computer and six meant the picture was least similar.

The lineups were presented in test booklets. Each lineup contained two rows of three line drawings of objects. Two blank white sheets of paper separated each test set so that subjects would not see the next

lineup before the appropriate time. Subjects were given a separate two page response form containing 15 sets with two rows of three blanks numbered from one to six. The response form provided blank places which corresponded to the spatial layout of the pictures shown in the lineups in the test booklet.

Results

The mean ranking for the critical items in the target-absent condition was 2.17 which differed significantly from the expected ranking of 3.5, $t(23) = 9.96$, $p < .001$. This indicated that subjects ranked the items that were more similar to the other lineup members than the other lineup members were to each other as being more similar to the target than expected by chance.

GENERAL DISCUSSION

The results of the two experiments indicate that a form of bias may exist when a lineup is constructed around a single face or item. Specifically, there is a tendency for a member who is more similar to the other lineup members than the other lineup members are to each other to be selected. This effect may bias a witness into choosing an innocent suspect merely because the suspect was the model for the lineup. Consider, for example, a situation where a witness has not had a reasonable view of an assailant and is eager to produce a description. If a suspect becomes the model for a lineup the witness may choose, perhaps unknowingly, the police suspect because of the bias promoted by this similarity effect.

The results of Experiment 2 indicate that the similarity effect is not limited to facial stimuli. These results suggest that embedding a member more like the other members than the other members are like each

other in a set of possible alternatives on any kind of test may influence a person to select this particular member even though it may not have been seen before.

It is suggested that lineups of any sort should not be constructed entirely around a target. Rather, distractors should also be based on attribute information in the other distractors. This would serve to prevent the similarity effect. A procedure for this might be as follows: Given a target, select the first distractor so that it is reasonably similar to the target. The second distractor should be selected so that it has similarities and differences with both the first distractor and the target. The selection of the third distractor should be based on similarities and differences with the selected distractors and the target. The selection process is complete when all the distractors are thus selected.

One way of assessing whether there is a bias in a lineup is to have a number of people who were not exposed to the target attempt to select the target. For example, a police lineup would be unbiased if a person who did not witness the crime is not more likely to select the suspect than would be expected by chance.

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