Local Processing Increases False Identifications

Dr. Robert S. Ryan
Bevin Lustman
Sam Elbeleidy
Kirsten Williams
Samantha Scott
Kutztown University

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Correspondence:

Robert S. Ryan
Box 730, Psychology Department
Kutztown University
Kutztown, Pennsylvania 19530
rryan@kutztown.edu

Abstract

Shifting people's processing from global to local impairs their ability to correctly identify a previously seen face from a lineup. We examined the effect of the processing shift on both correct and false identifications. For sequential, but not simultaneous lineups, local processing both impaired correct identifications and increased false identifications.

Local Processing Increases False Identifications

Schooler & Engstler Schooler (1990) found that describing a face actually impairs people's ability to recognize it. Subsequent studies suggested that the mechanism by which this impairment occurs is that describing a face shifts the way people process faces. When describing a face, people use local processing, for example noticing a detail such as a mole on the left cheek. When recognizing faces, people usually use global processing, for example noticing the overall shape of the face. According to the processing shift mechanism, after describing a face, people try to recognize faces by using the same kind of processing they used to describe it. Unfortunately, the local processing upon which describing relies is not as useful for recognizing faces as the global processing that is usually used. This mechanism has been supported by showing that directly shifting people's processing from global to local has the same effect on face recognition as describing the face (Macrae & Lewis, 2002; Perfect, 2003; Perfect, Dennis, & Snell, 2007).

However, this processing shift has mostly been shown to have a detrimental effect on correct identifications. In the legal system it is very important to know what factors affect peoples' false identifications. Therefore, in this study we examined the effects of the local/global processing shift on false identifications as well as correct identifications. Lindsay and Wells (1985) have shown that people make fewer false identifications on lineups in which the faces are presented sequentially than on those in which they are presented simultaneously. Therefore we also examined the effects of the local/global processing shift on both types of lineup.

Method

Participants

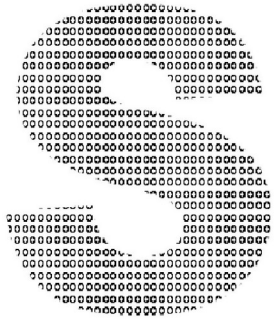
One hundred and ninety-two randomly selected adults participated in this experiment. Participants were recruited from shopping malls.

Procedure and Materials

Four experimenters worked in two teams of two. One experimenter was male and three were female. One experimenter in each team served as the target person and the other conducted the experiment. One experimenter served as the target for half of that team's participants, and the other served as the target for the other half. The target experimenter approached people in a shopping mall and asked for the time, making sure they made adequate eye contact with the potential participant. Then that experiment left the scene. Five seconds later, the other experimenter approached the participant and asked them to participate in a psychology study. Next, the experimenter manipulated whether the participants' cognitive processing orientation was global or local using Navon letters, as described below. Finally, the participant tried to identify the target person from a lineup.

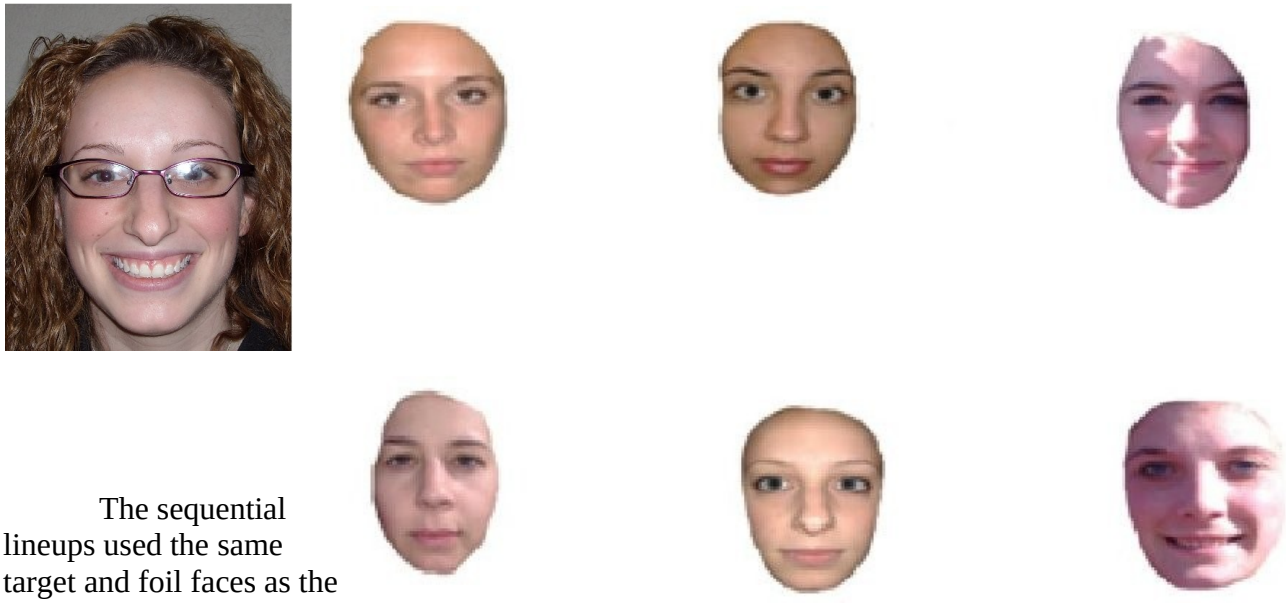
Processing Manipulation. The participant viewed 60 Navon letters twice (see Figure 1). Participants in the local condition identified the large (global) letter for the first 60 trials, and then the small (local) letters for the second 60 trials. Participants in the global condition performed the same two tasks, but in the opposite order. Thus, to equate for potential differences in the difficulty of the tasks, all participants performed both. However, it was the second task, which occurred immediately before trying to identify the target person, that determined whether a participant's processing orientation was global or local when they took the lineup test.

Figure 1. An example of a Navon letter.



Line-up Tests. Participants viewed one of four different line-up tests. The lineups were either simultaneous or sequential, and either target present or absent. For the simultaneous lineups, the faces were arranged in two rows of three faces (see Figure 2). The locations of the faces in the simultaneous tests were organized into six different configurations by rotating their locations around the rectangle formed by the two rows and three columns.

Figure 2. A target person and a target present simultaneous lineup.



The sequential lineups used the same target and foil faces as the simultaneous lineups. Considering the faces in each of the six different configurations of the simultaneous lineups as

being numbered sequentially from left to right, first across the top row, and then across the bottom row, the faces in the sequential lineups were presented in six different orders corresponding to those sequential numbers. For any target absent lineup, one additional foil face was used in place of the target face.

Design and Analysis

Participants were randomly assigned to either the local or global processing orientation, and to one of the four types of lineup test formed by crossing simultaneous or sequential, and target present or absent. All the factors were between subjects. Which experimenter was the target person and the configurations or sequencing of the test faces were counterbalanced across subjects.

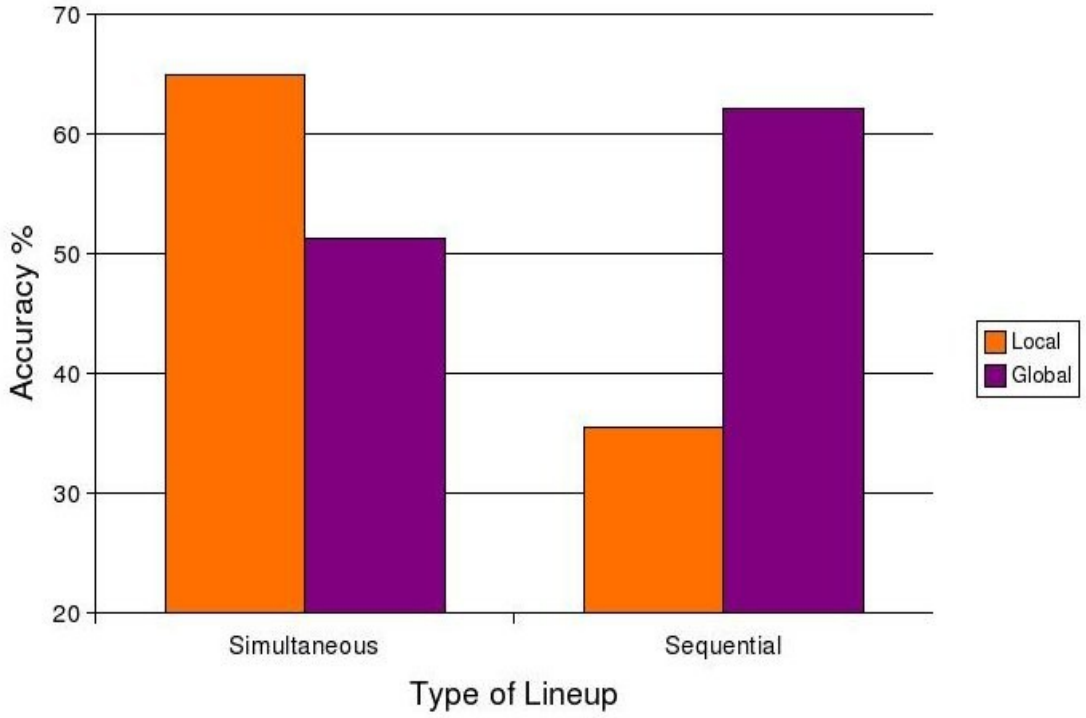
The procedure resulted in a completely randomized 2 by 2 by 2 design. The first factor was processing orientation, either local or global. The second factor was the type of lineup, either simultaneous or sequential. The third factor was the target person, either present or absent.

The dependent measure was identification accuracy. For a target present lineup, the participant received a score of 1 for identifying the target person or a score of 0 for any other response. For a target absent lineup, the participant received a score of 1 for correctly rejecting all of the faces or a score of 0 for any other response. The data were analyzed using a three factor, between subjects analysis of variance.

Results

As shown in Figure 3, collapsing across the target person factor, on the sequential line up, the local processors were impaired relative to the global processors. But there was no such difference for the simultaneous lineup. This resulted in a significant processing orientation by type of lineup interaction, F (1, 184) = 8.17, p = .005, MSE = .237.

Figure 3. Accuracy as a function of processing orientation and type of lineup, collapsed across presence or absence of the target person.



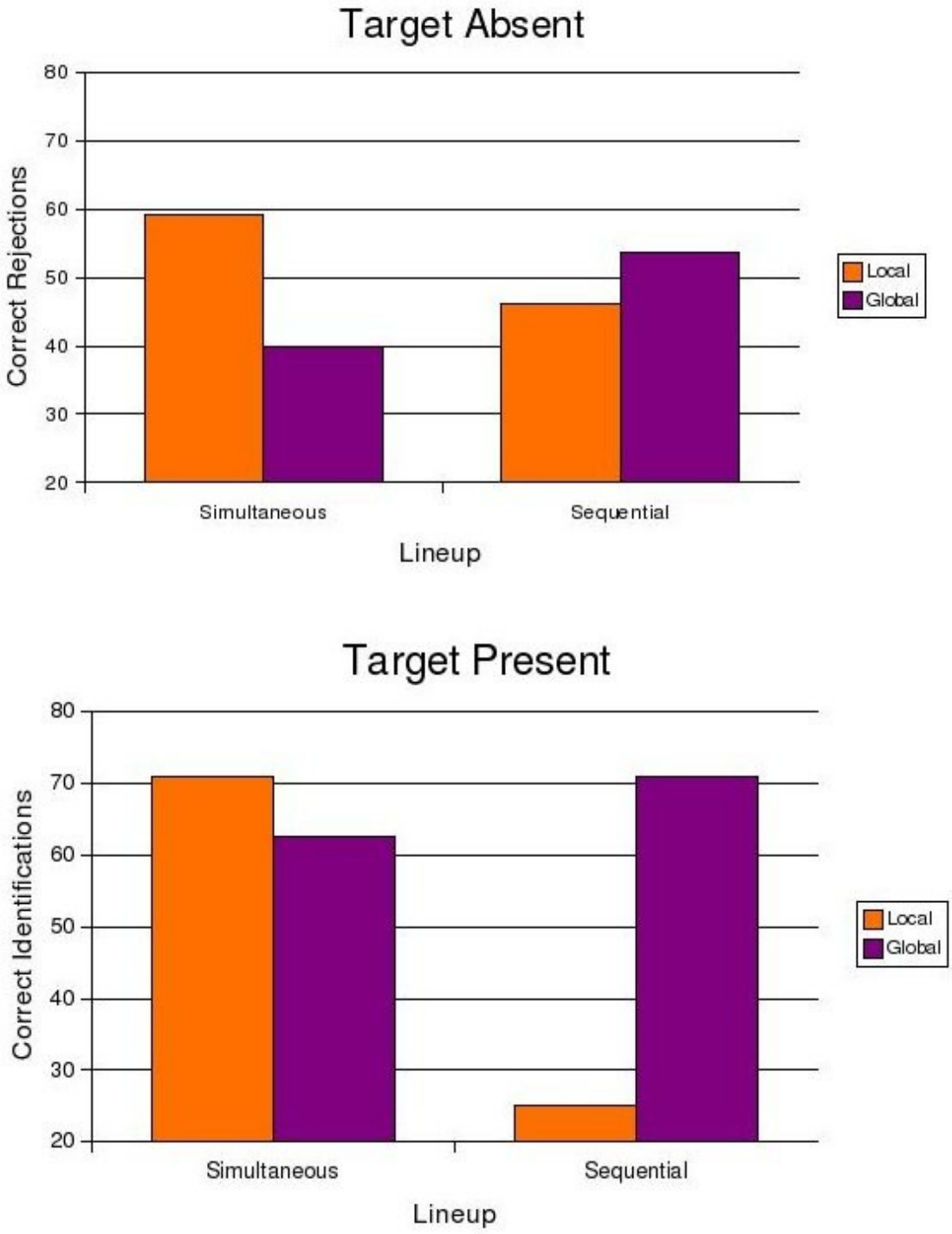
Simple effects tests showed that for the sequential lineup, the impairment of the local processors was significant, F (1, 184) = 7.60, p = .006, MSE = .237. For the simultaneous lineup, the local processors performed slightly, but not significantly, better than the global processors, F (1, 184) = 1.78, p > .05.

There were no main effects of processing orientation, type of lineup, or target person. There were no other interactions in the full factorial model.

Figure 4 shows the pattern of responses in all eight conditions. The 3 way interaction was not significant, F (1, 184) = .96, p > .05. Nevertheless, some readers may wish to know that the simple interaction between processing orientation and type of lineup was significant for the

target present condition, F (1, 184) = 7.43, p = .007, MSE = .237 although not for the target absent condition, F (1, 184) = 1.75, p = .188, MSE = .237.

Figure 4. Performance in all eight conditions.



Discussion

Local processing impaired participants' recognition ability in a sequential lineup test. It impaired their ability to correctly identify a target person that was present in the lineup, and it also resulted in more false identifications.

For the sequential lineup, the impairment of correct identifications was numerically larger than the impairment of correct rejections (i.e., the increase in false identification). However, considering those effects separately was not justified by a significant 3 way interaction.

We did not replicate the local/global processing effect in the simultaneous lineup condition. This may be at least partly due to our identification performance being generally lower than what had been seen in the studies that originally uncovered the local/global effect. Also, the Navon letters that we used were larger, overall, and had smaller feature letters than had been used in some of those original studies. One other researcher that we know of used the same Navon letters that we used and also had difficulty replicating the effect. That researcher reported finding a local processing bias for those Navon letters (T. Vanags, personal communication, March 6, 2008).

We are also aware of other researchers having difficulty replicating this effect (T. Perfect, personal communication, March 21, 2006). Whether the explanation for these failures lies in differences in the Navon letters, differences in the difficulty of the identification tests, or in some aspect of the procedure remains to be investigated further.

An important application of the local/global processing effect is to develop a method of improving eyewitness identification in real criminal investigations. Developing such a method, however, awaits sorting out the factors that contribute to reliably producing the effect.

References

Lindsay, R. C. L., & Wells, G. L. (1985). Improving eyewitness identifications from lineups: Simultaneous versus sequential lineup presentation. *Journal of Applied Psychology, 70,* 556-564.

Macrae, C. N., & Lewis, H. (2002). Do I know you? Processing orientation and face recognition. *Psychological Science, 13,* 194-196.

Perfect, T. J. (2003). Local processing orientation impairs line-up performance. *Psychological Reports, 93,* 393-394.

Perfect, T. J., Dennis, I., & Snell, A. (2007). The effects of local and global processing orientation on eyewitness identification performance. *Memory, 15,* 784-798.

Schooler, J. W., & Engstler-Schooler, T. Y. (1990). Verbal overshadowing of visual memories: Some things are better left unsaid. *Cognitive Psychology, 22,* 36-71.