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24 The Effects of Imagination of One's Own Future on Facial Recognition

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I. Introduction

The facial recognition literature (e.g., Diamond & Carey, 1977; Tanaka & Farah, 1993; Young, Hellawell, & Hay, 1987) suggests that configural information plays a primary role in facial recognition, while featural information is secondary. Featural information involves nameable parts of the face, such as the nose, eyes, and mouth (Farah, 1991), while configural information involves relations among parts of the face (Schwaninger, Ryf, & Hoger, 2003; Tanaka, & Sengco, 1997).

It is expected that performance on facial recognition tasks using configural processing will be better than that on tasks using featural processing. The processing used in the encoding phase is congruent with that used in the recognition phase. Even if configural information is processed to a greater extent than featural information during an encoding phase, performance on facial recognition tasks may decrease when featural information is used more than configural information, since the processing used in the encoding phase is incongruent with that used in the recognition phase. If the effects of prior tasks requiring featural processing are carried over to facial recognition tasks, inappropriate featural information will be processed more than configural information during the recognition task.

Macrae & Lewis (2002) investigated the effects of processes carried over from prior tasks using the Navon figure during a facial recognition task. The Navon figure is a large character drawn from sets of small characters. It was thought that searching the small characters of a Navon figure would require featural processing, while searching the large character of a Navon figure would require configural processing. Performance on a facial recognition task improved when participants engaged in a task that required reading large characters of Navon figures before the facial identification task. In contrast, performance on facial recognition tasks was impaired when participants engaged in a task which required reading small characters of Navon figures before the facial identification task. This result could be interpreted as follows. Reading the large or small letters in a Navon figure requires different types of processing, and each type of processing is carried over to the facial identification task. Differences in performance on the facial recognition task might therefore be observed.

However, there is another possible interpretation of the findings of Macrae & Lewis (2002). Lamb & Robertson (1988) argued that carry-over to the next trial was observed not because of processes but by the range of attention. The range of attention while reading small letters was narrow compared to that while reading large letters. In addition, the range of the attention in the post face recognition task was the same as that in the prior letter reading task. The larger range of attention was appropriate for the facial recognition task. Therefore, performance of a large-letter reading task might have better effects on a facial recognition task than performance of a small-letter reading task. Precise investigation requires that there be no differences in the range of attention to visual stimuli in the prior tasks in which a processing shift is induced.

A method featuring no difference in the range of attention to visual stimuli should be used for the task preceding a facial recognition task. According to Construal Level Theory (Liberman & Trope, 1998), featural information tends to be activated when imagining the near future. If this is true, such activation might evoke featural processing, which would be carried over to a facial recognition task. Featural processing also reduces the accuracy of facial recognition. When the near future is imagined between the encoding and recognition phases, the processing used in the encoding phase may be incongruent with that used in the recognition phase. Therefore, the aim of this study was to investigate the effect of imagining one's own future on facial recognition.

II. Experiment

1. Methods

1.1. Participants

A total of 97 participants ranging in age from 19 to 57 years took part in the present study. Participants were randomly assigned to one of three conditions: a near future condition, a far future condition, or a control condition.

1.2. Materials

Photos of 16 women were prepared. These photos were aligned in a 4×4 fashion. All photos were gray-scale and full-face. Two types of answer sheets were also prepared: one was for an inducing task, while the other was for a recognition task. Three subtypes of answer sheets were prepared for the inducing task.

1.3. Procedure

The experiment was conducted in a psychology class. Initially, a target woman was introduced as an assistant of the experimenter. When the target person entered the class, the experimenter left the room. The target person distributed the answer sheets for the inducing tasks. A period of 5 minutes was required to distribute the answer sheets.

After distributing the sheets, the target person gave instructions for the inducing tasks. Participants in the near future condition were required to provide answers concerning their plans for the next day. Participants in the far future condition were required to provide answer for their plans for 5 years in the future. Participants in the control condition were required to engage in a filler task. All the answers in each condition were written on the answer sheets. When 10 minutes had passed after the target person had entered the room, the target person left, and the experimenter entered the classroom.

A period of 5 minutes was required to complete the inducing tasks or filler task. The answer sheets for the inducing tasks were collected. Then, the answer sheets for a recognition task were distributed. Photos of 16 women were projected at the front of the classroom. Participants were required to select the photo of the target person who saw at the beginning of the class. Participants were also required to rate how confident they were about their choice. Finally, the answer sheets for the recognition task were collected, and the participants were debriefed and thanked.

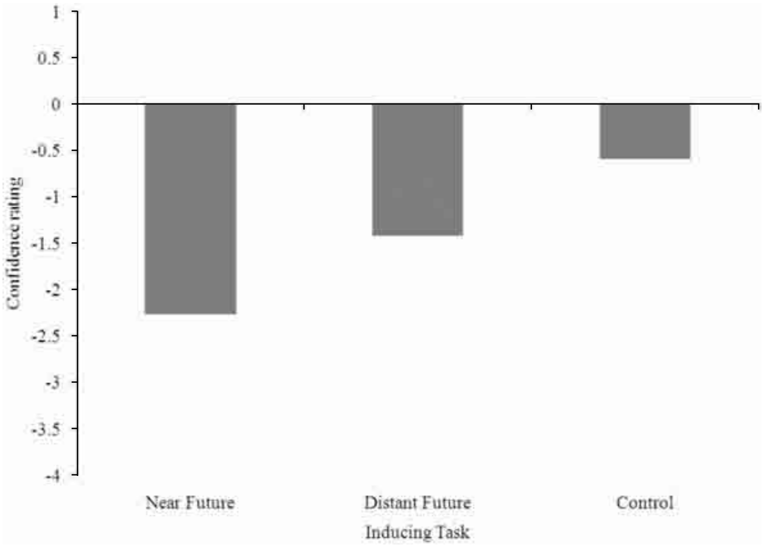

Figure 1. Mean confidence / accuracy measures.

2. Results

2.1. Accuracy of Recognition

The rates of identification of the target were 14.7% in the near future condition, 12.9% in the far future condition, and 28.1% in the control condition. There were no significant differences in rate of identification among these conditions (χ^2 (2, n=97)=2.93, *ns*).

2.2. Combined confidence / accuracy measure

A combined confidence / accuracy measure was calculated (Westerman & Larsen, 1997). Correct identification was assigned a positive rating, while incorrect identification was assigned a negative rating. The range of the combined confidence /accuracy measure was -7 to +7. Figure 1 shows the combined confidence / accuracy measures. The mean of the combined confidence / accuracy measure in the near future condition was -2.27 (SD=2.85), that in the far future condition was -1.42 (SD=3.29), and that in the control condition was -0.59 (SD=3.07). ANOVA was performed on the combined confidence / accuracy measure, with inducing task as factor. The main factor of inducing task was marginally significant ($F(2, 96)=2.37$, MSE=23.03, $p<.10$). The combined confidence / accuracy measure in the near future condition was significantly lower than that in the control condition ($p<.05$).

The combined confidence / accuracy measure in the far future condition did not differ from those in the control and near future conditions.

III. Discussion

The aim of this study was to investigate the effects of imagining one's own future on facial recognition. The mean of the combined confidence / accuracy measure in the near future condition was significantly lower than that in the control condition. This suggests that imagining one's own near future depends on featural information processing, and that such processing, which is inappropriate for facial recognition, can be carried over into a facial recognition task. This may have caused the reduction in the mean combined confidence / accuracy measure observed in the near future condition.

The mean of the combined confidence / accuracy measure in the near future condition was lower than that in the control condition. However, no difference was found between these groups in the rate of correct identification. One of the reasons why a reduction in the rate of correct identification was not observed in the near future condition may involve the floor effect. It will be necessary to rearrange the experimental conditions to boost the rates of correct answers and thus avoid this effect.

Our findings suggest that a prior task can affect facial recognition even when the task is ostensibly unrelated to facial recognition. Thus, even when two tasks appear logically unrelated, the prior task may nonetheless affect the results obtained on the subsequent task. In future research, it will be important to determine how processing style is carried over into facial recognition tasks.

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