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The role of stimulus' instability in the reproduction of visuospatial pattern

M. D. Giraudo • B. Berberian

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Background

Considering the dynamics of image stabilization, Giraudo and Pailhous (1999) asked participants to reproduce a complex, noisy visuospatial pattern several times in succession. Subjects were shown to experience difficulty stabilizing the image in memory up until the point the disturbance induced by the presentation of the variable pattern ended. At that point, a steady state is reached instantaneously. In the current study, to better understand the relationships between visual perception and visual memory, we manipulated image complexity.

Method

Over two experiments, participants were presented with patterns composed of 7, 12 or 17 dots that presented very small variations in position. On each of the first 20 trials, participants were presented with the same pattern and had to reproduce it. From trial 21 on, pattern presentation ended, and participants were asked to perform 20 new reproductions from memory (without renewed presentation). In the first experiment, the patterns were as far as possible from "good Gestalts" whereas in the second experiment, the patterns presented the characteristics of "good forms".

Results

The results were analyzed (1) in terms of accuracy (on the first twenty reproductions), that is, the discrepancy between the target pattern and each successive reproduction, and (2) in terms of variability over the reproductions (that is, the discrepancy between each successive reproduction independently of the target). Results showed that in both cases, and regardless of figure complexity (the number of dots), participants experienced difficulty stabilizing the image in memory up until target presentation ended (on trial 21). At that time, the level of variability instantaneously decreased to reach a steady state that was equivalent for the different patterns (7, 12 or 17 dots), and also for complex or simple forms.

Conclusions

These results (1) confirmed the previous results obtained by Giraudo and Pailhous (1999) (2) highlighted the specificity of visual perception regarding visuospatial memory. In particular, we observed that visual perception was sensitive to very small variations in dot position, even if the presented pattern was very simple, whereas memory appeared insensitive to the same variations regardless of whether the presented pattern was simple or complex.

M. D. Giraudo (✉) • B. Berberian
Faculté des Sciences du Sport,
Universitéde la Méditerranée, Marseille, France
e-mail: marie-dominique.giraudo@univmed.fr