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Free Classification: Evidence for an Analytic System of Overall Similarity Sorting

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Introduction

It has been shown that when people are asked, in the absence of experimenter feedback, to free classify stimuli into categories that appear natural to them, they tend to sort on the basis of a single dimension (e.g. Medin et al., 1987) rather than by overall similarity. This result is somewhat surprising considering that many natural categories appear to be organized around a number of characteristic features rather than a single defining feature.

Overall similarity (OS) sorting has often been considered to be due to a primitive, non-analytic process whilst unidimension (UD) sorting has been viewed as the result of a verbal, analytic process (e.g. Kemler Nelson, 1984). According to this theory, the experimental setting in which free classification is often studied encourages a more deliberate, analytic approach and hence single dimension sorting dominates. In contrast, when individuals are encouraged to classify non-analytically there is evidence that overall similarity sorting can be increased. More recently, however, it has been proposed that, at least under certain conditions, overall similarity sorting can be due to an effortful analytic, dimensional summation strategy (Milton and Wills, 2004). Three experiments are reported which further examine the contention that overall similarity sorting can be the result of an analytic process. All experiments employed a sequential match-to-standards procedure.

Experiment 1 – Concurrent Load

One prediction of an analytic account of OS sorting is that the addition of a concurrent load task during classification will reduce the amount of resources available and make an effortful dimensional summation strategy more difficult to perform. This account therefore predicts that a concurrent load task should decrease OS sorting compared to a no-load condition. Experiment 1 compared the amount of OS sorting produced either with or without a concurrent load task. It was found that the addition of a load task significantly reduced the amount of OS sorting ($p < .025$) providing evidence that OS can be due to an analytic process.

Experiment 2 – Working Memory Span

A further prediction of our account is that participants who possess a low working memory (WM) span might produce more single-dimension sorting in comparison to those participants who have a higher WM span, as they might be expected to find a dimension summation strategy more demanding. Experiment 2 investigated this by comparing the prevalence of OS sorting with WM span. The results indicated that participants who sort by OS have a higher WM span than participants who use a UD sorting strategy ($p < .025$).

Experiment 3 – Instructional Bias

If OS sorting is the result of an effortful analytic process, biasing participants to use an analytic strategy via experimental instructions should induce greater levels of OS sorting in comparison to neutral instructions. In Experiment 3, participants were given either neutral or analytic biased instructions. Results showed that participants in the analytic condition produced significantly more OS sorts than those in the control condition ($p < .025$). This again suggests that OS sorting can be due to an analytic processing strategy.

Conclusions

Three experiments are reported which investigate the idea that OS in a free classification task may be the result of an effortful, analytic process. Experiment 1 reduced the available capacity for analytic processing via a concurrent load task and found that this reduction in processing capacity resulted in an increase of UD sorting. Experiment 2 found that participants who produce OS sorts have higher WM spans than those participants who produce UD sorts. Finally, Experiment 3 showed that levels of OS sorting can be increased by encouraging participants to classify stimuli using an analytic strategy. Taken together, the results support the idea that under certain conditions, OS sorting can be the result of an effortful, time consuming analytic strategy.

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