

SHORT NOTE

INTEGRATION AND INTERFERENCE:
A NOTE ON BRANSFORD AND FRANKS' PARADIGM

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Bransford and Franks' (1971) paradigm has been subject to methodological and theoretical criticisms, a short discussion of which can be found, for instance in Hupet (1979) and Millward (1981).

Hupet points out that interference and confusion effects could explain most of their results because discriminability amongst test items is usually very low and, more specifically, because features, characteristic of a given item are of a great importance when this item is short, while they are lost among many other uncharacteristic features when this item is long. The assumption is of course that the longer an item the more features it possesses.

Moreover, Hupet questioned Bransford and Franks' notion of semantic integration mainly because several authors have reproduced Bransford and Franks' (1971) results with abstract materials like digit and letter strings or geometric patterns.

Vandierendonck (1983) suggests a unified interpretation of the paradigm. His approach does not discuss separately interference and recognition but assumes that the probability of a positive response in the recognition test is an increasing function of the similarities between the test item and the previously stored items. Using Tversky's (1977) contrast and ratio models, he shows that the construction of the material is then sufficient to explain the results. Although he does not describe those results as artefacts due to interference effects, it may be noted that Tversky's two models exactly predict the kind of dilution effects suggested by Hupet. Vandierendonck mixes Hupet's objections by showing that no semantic content seems necessary to explain the main effect and that only structural assumptions about the material are needed.

Evidence to the contrary can be found in Reitman and Bower's data (Reitman & Bower 1973). They have used four-tuples of letters and digits in a replication of Bransford and Franks' paradigm on three

groups of subjects. One group received exemplars of a simple concept (i.e. substrings of a string like: ABCD), another group received exemplars of a difficult concept (ie. substrings of a string like DZ6G). The third group received a mixture of the items presented to the first two groups. It must be noted that the structure of the concept to be abstracted by the first group was more salient than the structure of the concept presented to the second group; moreover it can be considered that the third group received in fact no concept at all and provided a control that did not exist in the original experiment (Bransford & Franks 1971).

Several interesting results were found:

1. all subjects were able to distinguish between old and new items in the recognition test;
2. in the first group, confidence scores followed the pattern described by Bransford and Frank;
3. in the second group no relation was found between confidence scores and length of items;
4. in the third (random) condition, the longer an item the more confident the subjects were that it had not been presented.

Those results are not in favour of a simple interference hypothesis since discrimination between old and new items remains. In fact Reitman and Bower (1973) used these results as evidence for an exemplar based model of categorization.

Reitman and Bower's results can be used to support the hypothesis that the main items (the *FOURS*) must be conceptual, which means they must have some kind of privilege related to their form and to the pregnance of that form for the subjects. This is a condition for the linear relationship between confidence and length to appear. The structure of presentation as such is not sufficient if the concept has a low salience. Still more interesting is the fact that in the no-structure condition (the control condition) a negative slope was found, this is clearly the contrary of Bransford and Frank's (1971) result.

Those results can certainly be explained in the context of Vandierendonck's suggestions, but it will therefore be necessary to use different parameter values in the model for the three different groups. These modifications will require an interpretation — in attentional terms for instance — and the final theoretical product will be a theoretical interpretation of prototypic categorization. As such it would probably be close to an exemplars-only categorisation model and would not assume the existence of a prototype but it would of course include

the above mentioned parameters and their interpretation and, in my opinion, would not be simpler than a prototype categorization model. This leads to an important discussion in which we will not engage here, but leaves intact an interesting fact about the paradigm: it may be thought to work only in case where a concept exists that has a sufficient salience. This distinction between the cases in which the paradigm does work or not can receive various interpretations but any one of them must take into account the kind of privilege those salient or semantic concept exhibit. We do not ambition to solve the exemplar/prototype dispute. Neither can we define the kind of semanticity such a salience implies. In fact things seemed clear with verbal material but what does semanticity mean with an abstract material? Barsalou (1983) has recently shown that purely ad hoc categories like «things to be sold at a garage sale» do have a prototypical structure. Other authors (Katz & Gruenewald, 1974) have shown that nonsense sentences yield the same results as Bransford and Franks' material. If we think of it, the original sentences about ants and jelly on a kitchen table are quite odd too. If we now consider the set of things that can be sold in a garage sale, that list makes little sense without the idea of what will be done with it. Barsalou (1983) suggests to extend our notion of what is «conceptual» to cover functional concepts whose unity depends on an action to be taken or imagined by the subject. He makes a quite convincing case for the importance of such concepts in problem solving.

It could probably be shown that the results obtained with abstract material (Katz, Atkeson & Lee, 1974) were not obtained with meaningless material or random material in Reitman and Bower's (1973) sense. This is highly probable since visual material is very richly structured because of the richness of visual perception. In the same direction, Neumann (1974) has shown that pure frequency effects were more important in a version of the paradigm that used geometric patterns as material than it was with faces, whose schema is probably well structured in advance.

The argument here, as in Millward (1981), is in fact that in the cases where the longer item can be perceived as a rule, the subjects' confidence ratings express how well the instance matches the rule and does not reflect their confidence in declaring it old or new. Although Reitman and Bower (1973) themselves provide a model to explain their results on the basis of the relative frequencies of presentation of the elements of the n-tuple, this model must assume different probabilities of recognition for different items of different length, which makes it weak.

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