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Does emotional valence affect performance in non-emotional categorization tasks?☆

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ABSTRACT

In five experiments, a categorization task was used to test whether threatening emotional valence would automatically affect reactions, even when valence is task-irrelevant. Financial threat words (e.g., debts) required the same response as either anxiety words or pleasant words. In the first three experiments, emotional valence was task-irrelevant because all words were categorized according to surface features. No advantage was found for the compatible threat-anxiety combination compared to the incompatible threat-pleasant combination. This occurred irrespectively of whether emotional valence was disguised or made obvious as a stimulus dimension, and whether one or two response dimensions were used. A compatibility effect was observed only when emotional valence was task-relevant (Experiment 4), or when valence was irrelevant, but the words were categorized according to their meaning (Experiment 5). We conclude that stimulus meaning has to be processed in order for emotional valence to affect responses.

Recent years have seen an explosion of interest in indirect measures designed to measure attitudes and associations. In contrast to direct measures, indirect measures do not directly ask individuals to reveal their attitudes and associations. Instead, they often employ reaction time (RT) tasks to conclude

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attitudes and associations from systematic differences in RTs. Indirect measures have become popular in many areas of psychology, including clinical psychology and experimental psychopathology, in order to measure clinically relevant associations in spider phobia (Ellwart, Rinck, & Becker, 2006; Huijding & de Jong, 2007; Rinck & Becker, 2007; Teachman, 2007; Teachman, Gregg, & Woody, 2001), social phobia (Heuer, Rinck, & Becker, 2007), depression (De Raedt, Schacht, Franck, & De Houwer, 2006), or alcohol use (De Houwer & De Bruycker, 2007), to name just a few. A recent special issue of the *Journal of Behavior Therapy and Experimental Psychiatry* was devoted to these measures, illustrating their applications, promises, and limitations.

Indirect measures of associations are expected to complement direct measures such as questionnaires and interviews by providing some specific advantages (see De Houwer, 2006). These include reduced susceptibility to biases introduced by self-presenting strategies, social desirability, and faking attempts. Similarly, there is hope that indirect measures may be able to predict automatic aspects of behavior, compared to direct measures which may be better at predicting more controlled aspects of behavior. Third, indirect measures may be able to assess associations, attitudes, and motives, while individuals are not aware of the fact that they are being measured. These associations, attitudes, and motives have been termed "implicit" or "automatic", and indirect measures may measure them without the need for conscious retrieval and inspection.

It has been difficult, however, to give a precise definition of "implicitness" or "automaticity" with regard to measurement outcomes and associations. De Houwer (2006) and Fazio and Olson (2003) discuss several possible features, including one that is of particular interest here: One may argue that a task measures a certain implicit stimulus dimension indirectly (e.g., the color, size, self-reference, or emotional valence of words), if the dimension affects responses despite the fact that it is totally irrelevant to the task at hand, and may safely be ignored for optimal task performance. Given the frequent use of categorization tasks as indirect measures of automatic associations, it would be important to establish whether such categorization tasks are capable of measuring implicit affective associations as defined by De Houwer (2006) and Fazio and Olson (2003). For instance, if task-irrelevant emotional valence affected responses in a non-evaluative categorization task, it would be much easier to argue that the task measures implicit affective associations.

The experiments reported here tried to establish such an effect of a task-irrelevant stimulus dimension (for a review, see De Houwer, 2003a). The dimension studied here, emotional valence, is a particularly relevant one in clinical research, especially in the form of the frequently used threatening stimuli (see references above). To this end, we developed a simple categorization task with emotionally positive words and negative ones. The task made no reference to the emotional valence of the words, and it could be completed perfectly well without paying attention to the words' valence. Nevertheless, we expected that emotional valence would affect responses despite being task-irrelevant. In that case, it would be much easier to argue that the emotional associations measured by the task are implicit.

The task used here was a variation of the *Single Target Implicit Association Test* (ST-IAT; Wigboldus, Holland, & van Knippenberg, submitted for publication) which is almost identical to the *Single Category Implicit Association Test* (SC-IAT; Karpinski & Steinman, 2006). In a ST-IAT, participants respond to three different types of stimuli by using only two different response keys. First, participants learn to classify so-called *attribute stimuli* into two categories. For instance, they might have to categorize these words according to their emotional valence: They press one of two possible keys in response to pleasant words, and the other key in response to unpleasant, anxiety-related ones. Simultaneously, participants learn a fixed response to so-called *target stimuli*. For instance, they always press the left of the two response keys when a finance-related word is shown. A frequent finding is that, even though the target words are not categorized according to their emotional valence, the responses to them are nonetheless affected by it: Participants respond to negative target words (e.g., denoting financial threat) more quickly in the compatible condition, that is, when they require the same response as the negative, anxiety-related attribute words. Similarly, responses to these threatening targets are slowed down in the incompatible condition, that is, when they require the same response as the positive attributes (and vice versa for positive targets). The target's degree of implicit threat is then concluded from the RT difference between compatible and incompatible condition: The larger the difference, the stronger the implicit threat association.