Type/Token Information in Category Learning and Recognition

Yasuaki Sakamoto (yasu@psy.utexas.edu)
Bradley C. Love (love@psy.utexas.edu)
Department of Psychology, The University of Texas at Austin
Austin, TX 78712 USA

Items that violate a salient category regularity are remembered better than items that follow the regularity (Palmeri & Nosofsky, 1995). A memory advantage for violating items is also found in the schema research (e.g., Rojahn & Pettigrew, 1992). Furthermore, work in the schema and category learning research suggests that the memory for inconsistent items is stronger when the violated regularity is more salient (e.g., Rojahn & Pettigrew, 1992; Sakamoto & Love, in press).

In Sakamoto and Love (in press), the salience of a regularity was manipulated by varying the number of items that conformed to it. Category A contained eight items that followed the regularity, whereas category B contained only four. The classification learning procedure encouraged subjects to entertain the rules "If value 1 on the first dimension, then category A" and "If value 2 on the first dimension, then category B." Each category contained an exception item that violated the rule (i.e., the regularity). The category B exception violated the category A rule, whereas the category A exception violated the category B rule. After learning, these exceptions were remembered better than the rule-following items, replicating Palmeri and Nosofsky (1995). Furthermore, following findings from the schema research, memory for the category B exception, which violated the more frequent category A rule, was enhanced (cf., Rojahn & Pettigrew, 1992). While SUSTAIN (Love, Medin, & Gureckis, 2004), a clustering model, correctly predicted these findings, current exemplar and hypothesis-testing models could not.

Type vs. Token

The category A rule-following items were more numerous in two ways. There were not only more rule-following tokens (i.e., instances of the rule) but also more rule-following types (i.e., distinct stimuli) in category A (cf., Barsalou, Huttenlocher, & Lamberts, 1998). Thus, the strength of the category A's regularity was attributable to both more tokens and more types. These two notions of "more" have perfectly co-occurred in the schema literature. The goal of the current research is to test the contributions of types and tokens independently of each other.

When repeating rule-following items from the category containing fewer types equated tokens, the exception that violated a regularity consisting of more rule-following types was remembered better (.86 vs. .65) than the exception that violated a regularity consisting of fewer rule-following types, $t(51) = 3.27$, $p < .01$. Preliminary results from experiments examining the effect of tokens independently of types are mixed across manipulations.

Discussion

The current results demonstrate that when tokens are held constant, items that violate a regularity consisting of many item types are remembered better than items that violate a regularity consisting of only a few item types. Future research will resolve the effect of tokens on recognition of violating items when types are equated. Stronger manipulations are currently being examined that avoid contrastive categories often used in category learning research. Work along these lines will illuminate future schema and category learning research and will advance our understanding of how humans represent rules, exceptions, and type/token information.

References

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