Title

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We report new results that demonstrate that selective attention to features is learned in the inverse base-rate effect. The inverse base-rate effect (Medin & Edelson, 1988) is found after participants have learned categories with different base rates (frequencies of occurrence). When tested with conflicting cues, participants tended to non-normatively respond with the low frequency category, suggesting that they were ignoring base-rate information.

The top of Table 1 (Training 1) shows the category structure for producing the inverse base-rate effect in disease diagnosis. The common diseases (C1 and C2) occur three times more frequently than the rare diseases (R1 and R2). One symptom (I1 or I2) is shared by two diseases and is an imperfect predictor. The other symptoms are perfect predictors, that is, they are associated with one and only one disease. In the testing phase (in the middle of Table 1) when shown I1 alone, participants tended to respond with C1. But, when tested with PC1&PR1 simultaneously participants tended to respond R1. The normative response, however, would have been to use the 3:1 base–rate information and respond C1.

Kruschke (1996) hypothesized that the inverse base-rate effect occurs because participants rapidly shift attention to reduce error while learning. Specifically he argued that participants tend to learn C1 before R1 because it occurs more frequently, and encode C1 in terms of both I1 and PC1. When subsequently learning R1, participants shift attention away from I1 and toward PR1 to avoid incorrectly responding with C1 and to protect what they have already learned about C1. Hence R1 tends to be encoded primarily in terms of PR1. Kruschke (1996) formalized this hypothesis in a connectionist model called ADIT which provides an extremely accurate account of the inverse base-rate effect data.

If the attentional account of the inverse base-rate effect is correct, it suggests that attention to the symptoms should *perseverate* into a subsequent learning task. To test this hypothesis, we added two different conditions after the test phase (the bottom of Table 1). The first condition (Training 2: "EASY") was designed to be easy to learn because PR is relevant for correct diagnosis, just as in previous training. This should have been easy because subjects should have already learned to shift attention away from I1 and toward PR1 (or away from I2 and toward PR2).

The second condition (Training 2: "HARD") was designed to be hard to learn because PR is irrelevant, unlike previous training. This should have been hard because while subjects should have previously learned to attend to PR1 (and PR2) and ignore I1 (and I2), I1 and I2 now were essential to learning the new diagnoses.

Table 1: Design of the experiment

Training 1:	I1&PC1 → C1 (3×)	I2&PC2 → C2 (3×)
	I1&PR1 → R1 (1×)	I2&PR2 → R2 (1×)
Testing:	I1? (→ C1)	PC1&PR1? (→ R1)
	I2? (→ C2)	PC2&PR2? (→ R2)
Training 2:	EASY: **PR** is relevant	HARD: **I** is relevant
	I1&PR1 → R1	I1&PR1 → R1
	I2&PR1 → R1	I2&PR1 → R2
	I1&PR2 → R2	I1&PR2 → R1
	I2&PR2 → R2	I2&PR2 → R2

Participants learned the "EASY" condition in phase II significantly faster than they learned the "HARD" condition. These results, along with others involving I and PC, support our hypothesis that learned attention to features perseverates into later learning. These results cannot be explained by an eliminative inference account, such as that presented by Juslin, Wennerholm, & Winman (1999).

Rapid attention shifts have also been implication in probabilistic learning tasks (Kruschke & Johansen, 1999). Perseveration of learned attention has also recently been implicated in the classic learning phenomenon of blocking (Kruschke & Blair, 2000).

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