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An Antidote to Illusory Inferences?

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Certain inferences are illusory: they have conclusions that are compelling but wholly wrong. For example, given that only one of the following two assertions is true:

There is a king or an ace in the hand, or both.
There is a queen or an ace in the hand, or both.

subjects judge that the ace is more likely to be in the hand than the king. In fact, it is impossible for an ace to be in the hand. Such illusions were predicted to occur by the mental model theory, which postulates that human reasoners normally represent what is true in their models, but not what is false. If this theory is correct, then a possible antidote to the illusions is to make people more aware of the false instances of premises. We therefore carried out an experiment in which subjects received such an antidote. Twelve illusory and control exclusive

disjunctions were presented in two blocks. For each problem in the 'antidote' block, participants were asked first to state what would falsify each of the premises (in inferences such as the one above), then to infer which card was more likely to be in the hand, and at this point they were reminded of their prior falsifications, which they were told were relevant to the task. In the 'no antidote' block, participants solved problems without having first falsified the premises. The 'antidote' block preceded the 'no antidote' block in half of the questionnaires, and this order was reversed in the other half. The antidote was a modest but reliable success. It also unexpectedly improved performance with problems that are not illusory. The results suggest that the tendency to focus on what is true at the expense of what is false is the cause of the illusions, but it is an entrenched attitude that is difficult to overcome.

	Group 1			Group 2			Grand Mean
	No Antidote	Antidote	Overall	Antidote	No Antidote	Overall	
Illusory	14	39	26.5	28	42	35	31
Control	58	75	66.5	64	83	73.5	70
Overall	36	57	46.5	46	62.5	54	50.5

Table 1: Percentages of correct responses