strategy selection, there is practical importance to the findings of this paper. In particular, because individuals appear to differ in how well they adapt their strategy use to changes in the task environment, it might be advantageous to select adaptive individuals for tasks in which the task environment frequently and rapidly changes (e.g., air traffic controllers). Performance in the KA–ATC task was strongly related to strategy adaptiveness—adaptive participants had much higher scores. These studies also suggest which factors may be good predictors of adaptiveness: Inductive reasoning and skill learning predicted whether people adapted; working memory, inductive reasoning, and fact learning predicted how much people adapted; and skill learning and processing speed predicted how quickly people adapted. Future studies should be directed at determining exactly which factors prove to be the best predictors across a variety of tasks and situations.

Assuming, however, that the correlates of adaptivity found in these studies prove to be the best predictor of adaptiveness, what possible mechanisms could explain these relationships? Inductive reasoning could play a role in adaptiveness in at least two ways. First, inductive-reasoning skill may be related to being able to notice shifting patterns in the environment. In the case of Study 3, this possibility seems unlikely because the base-rate manipulation was so heavy handed that it seems unlikely that any participants were unaware of the manipulation (at least among the nonexcluded participants). Moreover, Schunn and Reder (1998) found that noticing base-rate manipulations did not influence whether people adapted; instead, it was related to how much people adapted, assuming they adapted.

Second, inductive reasoning might be related to being able to quickly understand the relationship between a strategy and its effect or to being able to diagnose when a strategy is no longer appropriate. In a series of computational simulations of participant performance in these studies using the Adaptive Control of Thought–Rational framework (ACT–R, Anderson & Lebiere, 1998), Best, Schunn, and Reder (1998) found that developing an appropriate representation of the goal hierarchy for the landing task was key to being adaptive to the base-rate manipulation. In particular, it was necessary to set a goal to fill both runways (rather than simply a goal to land planes). If the participants did not induce this goal hierarchy, the model would predict that they would be insensitive to base-rate manipulations. Skill-learning ability might play a similar role here as well: How likely are people to adopt the correct skill decomposition for a task?

The role of working-memory capacity in extent of adaptation also has several possible causal chains. Presumably it involves an increased ability to keep information in mind while simultaneously performing the task, specifically base-rate information. In a related fashion, processing speed could be related to adaptation rate by allowing dual tasking: keeping track of outcomes while working at the basic task. Under this account, ability to retain the recent set of outcomes would predict how quickly the pattern of change can be detected and hence how fast one could adapt. Reasoning ability, in contrast, would predict whether given a pattern, the individual understood what strategy to adopt for best performance with the new pattern.

How generalizable are the findings from these studies? Analyses of individual differences in question-answering and simple problem-solving tasks (Schunn & Reder, 1998) suggest that existence of individual differences in strategy adaptivity is a quite general phenomenon. An open question is whether the strategy adaptivity approach might be applied fruitfully to other areas of individual differences (e.g., child development, aging, expertise, etc.). If the groups differ in reasoning ability, working-memory capacity, or speed of processing, then the results from this paper suggest there should be adaptivity differences across those other groups as well. Yet Siegler and Lemaire (1997) found no group differences in strategy adaptivity in their older–younger adult comparisons for which previous research suggests that there are processing speed or working-memory capacity differences.

One possible explanation of the lack of effect in the Siegler and Lemaire study is that Siegler and Lemaire looked at adaptivity in a static domain, mathematics. Base rates were not manipulated, and significant learning did not occur over the course of the experiment. Thus, although participants may have exhibited a crystallized strategy adaptivity in which they chose strategies appropriately based on features of the problem, they did not need to exhibit a fluid strategy adaptivity in which they chose strategies using feedback from (possibly changing) base rates of success. This analysis suggests that if Siegler and Lemaire had included a base-rate manipulation, they might have found group differences.

There are many conceptions of adaptivity. The preceding paragraph raised the possibility of static versus fluid adaptivity. The bulk of this article has focused on adaptivity in strategy use, in particular adaptivity to changing base rates of strategy success. It is an open question as to how base-rate-strategy adaptiveness might relate to other kinds of adaptiveness. For example, it may be correlated with individual differences in the ability to adapt to instructions (Reder, 1987; Shebilske, Goettl, & Regian, 1999), in the ability to select and change representations (Lovett & Schunn, 1999; Schunn & Klahr, 1996; Schunn & Lovett, 1996), or in the ability to adaptively control attention (Gopher, 1982, 1996; Gopher & Kahneman, 1973).

In conclusion, this article has provided evidence for a new kind of individual difference: differences in strategy adaptivity. The article has also described new methods for assessing, validating, and predicting such individual differences. There are several advantages to the strategy-adaptivity approach to individual differences. First, this approach builds on the strengths of the parameter-difference and strategy-difference approaches to individual differences. Because it analyzes the strategies underlying tasks as the strategy approach does, the strategy-adaptivity approach can provide a detailed account of performance on any particular task. Because it searches for predictive features relating to the individual outside of the details of the particular domain, as the parameter approach does, the strategy-adaptivity approach should be able to account for correlated performance differences across many tasks and domains. Finally, the strategy-adaptivity approach promises to provide new insights into the mechanisms underlying strategy selection and the nature of individual differences.

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