Effects of Question Format on Test-Taker Cognition

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Abstract: Technology-based, interactive test questions are common in large-scale assessments, yet how alternative question formats influence test-taker cognition is not well understood. In a series of studies, we investigated test-taker performance on isomorphic questions using alternative presentation layouts and modes of responding. Adult participants solved math problems in three formats, each of which regularly appear in many large-scale assessments: 1) forced-choice (explicit True-False options) presented in a table format, 2) check-all-that-apply (implicit True-False options) presented in a table format, and 3) check-all-that-apply presented as separate questions. Participants’ solution time and affirmative selection rate suggested different cognitive processes for the question formats, particularly when they were uncertain of their answers. We propose a cognitive model to account for the results and predict the impact of alternative question formats on test-takers. We discuss how principles of cognitive science and human-computer interaction provide direct implications for designing assessment questions and understanding test-taker cognition.