

# APPLYING COGNITIVE PSYCHOLOGY TO EDUCATION

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## Editorial

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This special section of *Psychonomic Bulletin & Review* was inspired by a symposium that Ayanna Thomas and I organized for the 2005 meeting of the Psychonomic Society. The symposium focused on new research that applied basic topics in cognitive psychology to educational issues. Although the research was new, the idea that cognitive psychology should be well positioned to guide practices in teaching and education is certainly not novel. As early as 1910, Edward L. Thorndike noted the potential contribution of psychology to education: “Just as the science and art of agriculture depend upon chemistry and botany, so the art of education depends upon physiology and psychology” (p. 6). Modern-day cognitive psychologists have refined that theme, asserting that “there are probably few contexts in which the application of memory research should be more obvious than in the context of higher education” (Naveh-Benjamin, 1990, p. 296; see also pioneering work by Ausubel, 1963; Gagné & Rothkopf, 1975; Mayer, 1987; Rothkopf & Bisbicos, 1967). Indeed, virtually all of the topics that are the foundation of our cognitive sciences—attention, learning, concept formation, problem solving, text processing, and metacognition—are intimately involved in the educational process.

Not surprisingly, then, within cognitive psychology there is a hearty core of researchers who have directed their efforts toward applying cognitive theories to educationally relevant research and highlighting the educational implications of our research findings. Yet our discipline as a whole has largely ignored educational issues and has instead focused predominantly on basic research conducted to elucidate theoretical processes in memory, concept learning, problem solving, and language comprehension. Some of us may have given occasional consideration to how our work might inform education. However, our paradigms have infrequently used educational types of materials, and we rarely implement experiments using parameters that might be relevant to education. For instance, in memory research, retention intervals are often on the order of minutes and target materials are often word lists.

Even when our basic paradigms have revealed principles that readily translate into educationally relevant implications, our field has done little to transport those principles and findings to an audience that could benefit from them and implement them in the classroom. For instance, one can still find texts of educational psychology that advocate increasing the amount of study time as a way to improve learning, even though basic memory research published in the 1970s cautioned against embracing the “total-time” hypothesis for long-term recall of target information (e.g., Craik & Watkins, 1973; Melton, 1970). Thus, cognitive psychology’s influence on education seems to have fallen short of the enormous potential suggested by our experimental methods and focal areas of study.

I believe that the special section to follow signals a changing of the tides. Influential cognitive psychologists are beginning to foreground educational concerns in their work, and this work is appearing in our flagship journals. Given the increasing concern about the effectiveness and quality of our educational systems and approaches, federal support for educationally relevant research grounded firmly in cognitive psychology is expanding (e.g., the Institute of Education Sciences). Some in the educational community and society at large are receptive to “evidence-based” principles and findings about how to improve education (e.g., conferences organized by the Reinvention Center, an NSF-sponsored center for reinvigoration of undergraduate instruction). And, as evidenced by the full convention hall at the symposium at the 2005 meeting of the Psychonomic Society, there is clearly an audience of cognitive psychologists interested in linking cognitive research to educational concerns.

To document and stimulate this trend in cognitive psychology, in this special section of *Psychonomic Bulletin & Review* we have assembled papers from the presenters at that symposium and from other researchers whose work is framed in terms of educational translation. To foster accessibility and provide breadth, we asked authors to briefly survey their experimental and theoretical work, leaving the presentation of details to other sources. The work that follows illustrates how educationally relevant issues provide a rich environment in which to situate investigations of memory, metamemory, mathematical problem solving, and writing. Moreover, such research raises interesting new questions and theoretical issues. I am hopeful that the reader will be enthusiastic about the creative and rich work that these papers report and will come away as I did with a sense of the great opportunities our field has to move our research into an extremely visible and valuable domain.

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