

Teaching Current Directions in Psychological Science

C. Nathan DeWall, University of Kentucky, and renowned textbook author and APS Fellow David G. Myers, Hope College, have teamed up to create a new series of Observer columns aimed at integrating cutting-edge psychological science into the classroom. Each column will offer advice and how-to guidance about teaching a particular area of research or topic in psychological science that has been the focus of an article in the APS journal Current Directions in Psychological Science. Current Directions is a peer-reviewed bi-monthly journal featuring reviews by leading experts covering all of scientific psychology and its applications and allowing readers to stay apprised of important developments across subfields beyond their areas of expertise. Its articles are written to be accessible to non-experts, making them ideally suited for use in the classroom.

Teaching the Testing Effect

by David G. Myers

Carpenter, S. K. (2012). Testing enhances the transfer of learning. *Current Directions in Psychological Science*, 21, 279–283.

Given the complexity of human behavior, it can be difficult to identify factors that affect it so consistently that they can confidently be labeled as *laws* or *principles*.”

Shana Carpenter’s opening sentence suggests an interesting question for classroom discussion: “*What are examples of reliable psychological science laws or principles?*” A few moments of reflection brings to mind several proud-of-psychological-science discoveries:

- The partial reinforcement effect (on resistance to extinction)
- The misinformation effect (incorporating misleading information into memories)
- Inattention blindness (failing to see visible objects when our attention is directed elsewhere)
- The facial feedback effect (expressions affect emotions)
- Mood effects on memory
- Group polarization
- Hindsight bias
- Overconfidence and illusory optimism
- Bystander effects on emergency helping
- Sleep support of memory consolidation

Class discussion could extend this top-of-the-head list, to which Carpenter adds one more, the oft-demonstrated *testing effect*: “Taking a test on learned information, compared with simply restudying it, renders the information more likely to be remembered.” Thus, for example, English speakers given a French-English phrase such as *le chien* – *dog* remember the association better if it’s followed by a retrieval attempt (*le chien* – ?) rather than restudy (*le chien* – *dog*).

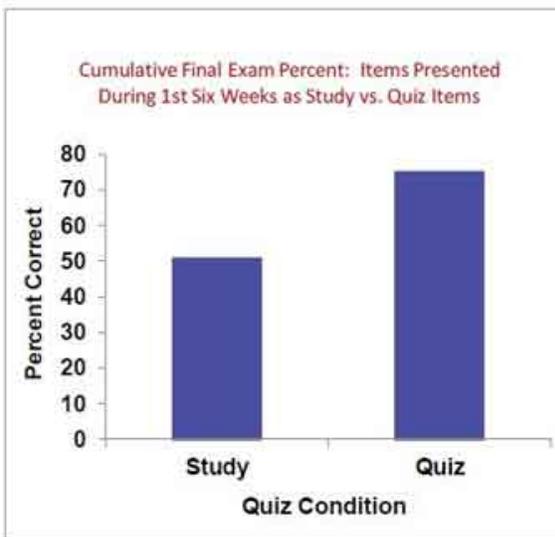


Figure 1

Carpenter shows that testing also “enhances the transfer of learning.” The testing effect, she reports, generalizes across time, testing format (such as cued vs. free recall), and knowledge domain. It is robust and has been widely studied and applied. There are several exemplary articles and resources that can support student discussion of the testing effect.

Henry L. Roediger, III, one of the leading researchers in this area, discussed research on the teaching effect in his 2012 APS William James Fellow Award Address on “[Cognitive Enhancement of Education: From the Lab to the Classroom.](#)”

Roediger paid tribute to William James, whose 1890 *Principles of Psychology* declared that “It pays better to wait and recollect by an effort from within, than to look at the book again. If we recover the words in the former way, we shall probably know them the next time; if in the latter way, we shall very likely need the book once more.”

As Roediger and his colleague Jeffrey Karpicke (2006) have written, “Testing is a powerful means of improving learning, not just assessing it.” Repeated, spaced self-testing, with material of “desirable difficulty” and with immediate feedback, boosts retention. Thus, advised Roediger in concluding his APS lecture, teachers should use “constant assessment.” When they do, “students study more, monitor their knowledge better, learn more and retain more for the long term.” For more, see Roediger’s website on “[Test-Enhanced Learning in the Classroom.](#)”

Other researchers — Mark McDaniel and Kathleen McDermott (Washington University in St. Louis), Gordon Hodge (University of New Mexico), Gilles Einstein (Furman University), and Victor Benassi (University of New Hampshire) — have confirmed the benefits of retrieval practice in actual classroom situations — benefits that instructors can apply to their teaching and students to their learning. Moreover, the testing effect is nonobvious. When Jeffrey Karpicke and

his colleagues (2009) asked students what activities lead to learning, common answers included rereading, highlighting, and reviewing class notes.

Gilles Einstein and his colleagues (2012) demonstrated the testing effect by having students read material using either a Study-Study or Study-Test strategy. Their quiz performance a week later demonstrated the testing benefit, which the students then described in a lab report. At the end of the term, these students reported incorporating more *self*-testing into their studying.

In an unpublished study, Victor Benassi and his colleagues at the University of New Hampshire gave introductory psychology students frequent in-class quizzes on assigned readings. For some of the items, the answers were provided along with the question (Study Trials). For other items, students were asked to try to recall the answer (Quiz Trials). When tested on a final exam, the testing benefit on multiple-choice application questions was evident (Figure 1). Students performed much better on questions that had been “tested” on quizzes earlier in the course.

To introduce students to the testing effect and its power to boost their own learning, we offer a 5-minute animation, “Make Things Memorable! How to Study and Learn More Effectively.” It’s freely available for classroom or student use at tinyurl.com/HowToRemember.

References

Carpenter, S. K. (2012). Testing enhances the transfer of learning. *Current Directions in Psychological Science*, *21*, 279–283.

Einstein, G. O., Mullet, H. G., & Harrison, T. L. (2012). The testing effect: Illustrating a fundamental concept and changing study strategies. *Teaching of Psychology*, *39*, 190–193.

Karpicke, J. D., Butler, A. C., & Roediger, H. L. (2009). Metacognitive strategies in student learning: Do students practice retrieval when they study on their own? *Memory*, *17*, 471–479.

Roediger, H. L. & Karpicke, J. D. (2006). The power of testing memory: Basic research and implications for educational practice. *Perspectives on Psychological Science*, *1*, 181–182

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