Developing Guidelines for the Use of PowerPoint in the Psychology Classroom

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Introduction
PowerPoint is widely used in college classrooms. Whether it is useful is controversial. Despite industry suggestions for “effective” PowerPoint use, critics argue that these suggestions are based neither on evidence nor on common sense. For example, Tufte (2006) points out that the 7-point rule for number of lines of information to be presented on an individual slide is neither known to affect memory nor comprehension. In response to critiques and in reaction to their own curiosity, researchers are beginning to evaluate the empirical research on PowerPoint’s use in the classroom (see Empirical Studies above). We selected variables to study based both on theoretical and practical considerations. Mayer’s (2005) theory on multimedia learning suggested that pace of the lecture, amount of information presented in a PowerPoint slide, and segmentation of a lecture are key variables. Student-centered variables, such as note-taking and field dependence/field independence were evaluated because of their role in student learning (e.g., Kiewra, 1985; Frank, 1984). Finally, according to cognitive load theory, previous knowledge also affects learning outcomes from multimedia-enhanced presentations (e.g., Kalyuga et al., 2003), so we controlled for previous knowledge of our lecture topic in each analysis.

Our Research

Background
After evaluating the empirical research on PowerPoint’s use in the classroom (see Empirical Studies above), we determined that controlled laboratory experiments would benefit the area. We selected variables to study based both on theoretical and practical considerations. Mayer’s (2005) theory on multimedia learning suggested that pace of the lecture, amount of information presented in a PowerPoint slide, and segmentation of a lecture are key variables. Student-centered variables, such as note-taking and field dependence/field independence were evaluated because of their role in student learning (e.g., Kiewra, 1985; Frank, 1984). Finally, according to cognitive load theory, previous knowledge also affects learning outcomes from multimedia-enhanced presentations (e.g., Kalyuga et al., 2003), so we controlled for previous knowledge of our lecture topic in each analysis.

Methodology
Across several studies, student participants reported on their perceived familiarity with our presentation topic, neuron communication. The lecture was pre-recorded at slow, normal, and fast paces with and without a text-based PowerPoint presentation. The PowerPoint presentation was manipulated for amount of information presented (full-text versus outline of lecture). Other manipulations, as discussed above, were incorporated, and in all studies participants were randomly assigned to conditions. Immediately after viewing the lecture, participants completed a test of retention and a test of transfer.

Results
Across studies, we discovered that there were few differences between groups, regardless of the manipulation or measurement tool used (e.g., Hamilton et al., 2008). In separate studies, we have used multiple-choice, true-false, and essay questions for the tests of retention and transfer. In a recent study, we found that note-taking did affect learning from the lecture, but the use of PowerPoint did not interact with note-taking (Hamilton et al., 2010).

Discussion
Our research has focused on the “default” use of PowerPoint, which is a series of bullet points containing text information. Across several studies, PowerPoint did not enhance students’ ability to retain or transfer information presented during a lecture. These findings contribute to the empirical body of work in that these are the first set of controlled studies on the use of PowerPoint.

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References