

Video-Based Test Questions: A Novel Means of Evaluation

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Many psychology instructors present videotaped examples of behavior at least occasionally during their courses. However, few include video clips during examinations. We provide examples of video-based questions, offer guidelines for their use, and discuss their benefits and drawbacks. In addition, we provide empirical evidence to support the use of video-based test questions. The data indicate that students preferred video-based questions to multiple-choice questions on a variety of outcome variables, and data suggest that student learning may be enhanced. The use of video-based test questions that is discussed in this paper can be applied to a variety of educational disciplines and levels.

Most instructors agree that high-quality examinations in courses should serve the dual goals of instruction and evaluation (Renner & Renner, 1999). Traditionally, these goals have been served by six types of questions: multiple-choice, true-false, matching, fill-in-the-blank, computation-based, and essay. We propose the inclusion of questions based on video clips in which students respond to behavioral data during exams. In this article we provide examples of video-based questions in the field of psychology, offer guidelines for their use, discuss their benefits and drawbacks, and provide data supporting the utility of video-based questions. We have opted to present the idea of video-based assessment through the lens of psychology. However, video-based test questions could be utilized in any discipline relating to behavior (e.g., ethological sections of biology courses, education courses) and be adapted to any educational level.

Given the fundamental basis of behavior in psychology, it is interesting that instructors show videos during non-exam class sessions to demonstrate psychological principles, but do not employ video-based questions on exams. There is no mention of video-based

questions in major pedagogical books (e.g., Lowman, 1995; McKeachie, 2002), as well as in articles that promote the use of videos for psychology courses (e.g., Boyatzis, 1994; Green, 2003; Hollander, 2000). Video-based questions might fall under the umbrella of *performance tests* (Davis, 1993), although a more typical member of this category would be laboratory tasks.

We have successfully used video clips on exams that (a) were already viewed by students in class when originally learning material, (b) were based on lectures and discussion but had not been seen by students, and (c) were similar but not identical to video clips when originally learning material. In a developmental psychology course, for example, the first author presented video clips of the same infant engaging in classic Piagetian tasks over the first two years of life during non-exam class sessions. For the exam, students viewed one of these clips and applied their knowledge of assimilation and accommodation via essay to the presented behavioral observations, as well as answered a multiple-choice question inquiring about the infant's specific stage of sensorimotor development. In an introductory psychology exam, the second author presented a clip that students had never viewed of a patient displaying symptoms of schizophrenia and asked students to list the symptoms of the patient along with examples of his behavior to substantiate the symptoms they listed. In a

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different introductory class session, the second author presented a video of a split brain patient named "Joe" answering questions about visual images presented to either his left or right visual fields. During the exam, the instructor showed a similar video of a split brain patient named "Vicki" and asked students to explain the results of her test.

Video-Based Questions: Guidelines, Benefits, and Drawbacks

Instructors should consider several factors when employing video-based questions. First, to conserve class time, clips of behavioral data should be no longer than 2 or 3 minutes. Second, instructors should choose clips for which students must attend to the whole rather than the details because clips that require careful scrutiny generally require multiple viewings (an often distracting circumstance when some students are trying to write answers to the exam). Finally, instructors should tailor the format of the questions they use about the video clips to the type of information they wish to ask students. Although we have used multiple-choice questions successfully, we find that short-essay questions are often most appropriate as they require students to more fully explain and apply psychological concepts to given behavioral clips.

Video-based questions may offer several advantages. First, we have noticed that students attend to video clips during class much more when they know that they will see clips during an examination and will have to evaluate them in relation to a psychological principle. Thus, students may perceive video clips as important and increase their motivation to understand the behavioral data.

Second, some students perceive themselves to be "visual learners." Students often report that they appreciate the use of video-based questions because such questions allow them to demonstrate their knowledge by means other than traditional questions.

Third, video-based items arm instructors

with an additional means to evaluate students' understanding of material in a novel context. For example, when discussing behavioral neuroscience, an instructor in class may discuss how strokes affect human behavior. For an exam, the instructor may play a clip of an individual with slurred speech and weakness on the right side of the body and ask students to explain why the stroke affected the patient in this manner. This type of question requires students to apply their knowledge of behavioral neuroscience outside the context in which they originally learned it. Armed with the ability to analyze behavior that they have never before encountered, they may have increased confidence to apply psychological concepts to their observations outside the classroom.

In contrast, using video-based items involves some drawbacks. First, although instructors can begin using video-based items with a small library of clips, they should optimally have a large video-clip collection as they may wish to use one video clip during a class when students learn material and a different clip on the same topic for a video-based test item. This problem becomes easier to overcome each year as more publishers provide short clips with their textbooks and several articles provide video sources for psychology courses (e.g., Boyatzis, 1994; Fleming, Piedmont, & Hiam, 1990; Green, 2003). Second, video-based items can detract from the self-paced nature of exams and disallow students to review the clip once the instructor is finished showing the clip. We typically show the videos 10 minutes into the exam to avoid problems with late-arriving students. Finally, perhaps the most serious drawback is that it is very difficult to present the video-based items during "makeup" exams. We tend to use different video clips for makeup exams along with a different version of the entire exam, but this practice will differ, of course, depending on instructors' policies.

Student Data

Outcome data support the use of video-based test items. First, students in an Introductory Psychology course ($n = 38$) and a Developmental Psychology course ($n = 23$), taught by two different instructors, anonymously completed a questionnaire to assess their perceptions of video-based questions. Students indicated their agreement with four statements each for video format questions and multiple-choice questions, using a Likert scale (1 = *strongly agree*, 3 = *neither agree nor disagree*, 5 = *strongly disagree*). Student responses did not significantly differ between the courses. With question format (video-based vs. multiple choice) as the independent variable and students' ratings as the dependent variable for each question, repeated measures ANOVAs indicated that students thought the video-based questions deepened their level of understanding of the material, assessed their understanding of "real-life" behavior, were a fair assessment of their knowledge

compared to the multiple-choice items, and recommended that video-based questions be included on future exams (see Table 1).

The second piece of evidence supporting the use of video-based test items comes from a quasi-experiment in which students from one Introductory Psychology course ($n = 39$) were instructed at the beginning of the last unit of a semester-long course that there would be video-based questions on the exam, whereas students in another Introductory Psychology course ($n = 34$) did not receive these instructions (although these students were told that they were responsible for *all* information presented during class). The same instructor taught both courses presenting the same material and the classes did not differentially perform on examinations earlier in the semester (all $ps > .05$). Participants in both classes received the same exam, a portion of which included 12 video-based test items as extra credit (essay, short-answer, and multiple-choice) derived from three different

Table 1
Student Evaluations of Video-Based and Multiple-choice Test Formats

	Video-based Format		Multiple-choice Format		F(1, 60)	Eta-squared
	M	SD	M	SD		
Studying for the video format (multiple-choice) questions on the exam deepened my level of understanding of the material.	2.38	1.10	2.80	1.17	4.86*	.08
Studying for the video format (multiple-choice) test questions assessed my understanding of "real-life" behavior better than traditional testing methods (video-based questions).	2.36	1.18	3.44	.92	24.54**	.29
The video-based format (multiple-choice) exam questions are a fair assessment of my knowledge of the class material.	2.48	1.22	3.33	1.13	13.32**	.18
I would recommend that the use of video-based (multiple-choice) exam questions be continued on future exams.	2.39	1.23	3.13	1.26	9.40**	.14

* $p < .05$ ** $p < .01$

video clips that the students had never seen in class (thus requiring students to extend their analysis to novel clips). All of the students in this study attempted to answer all of the video-based questions. Students told at the beginning of the unit that their exam would include video-based items correctly answered more ($M=9.95, SD=1.49$) video-based items than did the control group ($M=8.47, SD=2.78$), $F(1, 71) = 8.33, p < .01, \eta^2 = .11$. Although this study must be interpreted with caution, the study provides initial support for including video-based questions on exams.

The above data constitute a first step in understanding the utility of video-based questions and raise several important issues. For example, it is uncertain whether video-based questions or traditionally formatted questions better distinguish between students who can successfully apply psychological concepts to real-life behavior. In addition, it is unclear whether improved performance on video-based exam questions translates into more sophisticated analysis of behavior outside the classroom. These and other important issues related to video-based questions deserve future empirical attention.

Conclusion

Instructors can readily employ video-based questions in a variety of disciplines including education, biology, social work, and, perhaps even physics and chemistry. Although there are drawbacks, we believe the benefits outweigh the problems. Instructors who use video-based questions have a unique opportunity to write creative and valid questions to assess their students' understanding of important concepts in relation to real-life behavior.

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