

All kidding aside: Humor increases learning at knowledge and comprehension levels

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Abstract: It has been argued that humor is beneficial in the classroom because it increases social bonding between instructor and student, salience of information, and ultimately recall and retention. The current study sought to add to the literature by empirically testing some assumptions about humor as a pedagogical tool. Specifically, we predicted that using humor in a classroom setting would enhance learning on the first three levels of Bloom's taxonomy (i.e. knowledge, comprehension, and application). Results indicated that using humor to teach material significantly increased students' overall performance on exams, particularly on knowledge and comprehension level quiz items, but not application level items. Moreover, learning a construct through the use of humor was most effective for comprehension level quiz items. This study provides some of the first ecologically valid evidence that humor may maximize learning outcomes in college classrooms.

Keywords: humor; Bloom's taxonomy; classroom assessment, teaching strategies

I. Introduction.

Boredom may be the largest pedagogical obstacle to teaching (Smith, 2007), and many believe it is up to teachers to spark students' interest in classes. One way to ignite students' enthusiasm is by using humor. In the classroom, humor can create a cheerful learning climate, enhance social bonding through increased student-instructor interaction, add variety to lectures, decrease test anxiety, and provide enjoyment and laughter, (Bryant, Comisky, Crane, & Zillmann, 1980; Gorham & Christophel, 1990; Kaplan & Pascoe, 1977; Neumann, Hood, & Neumann, 2009; Schmitz, 2002).

In addition to the social benefits, humor is cognitively and pedagogically important. For instance, instructional humor has been touted as an excellent way for students to learn vocabulary, increase critical thinking, practice semantics, and remember more information (Bell, 2009; Dormann, & Biddle, 2006; Forsyth, 2003; Hill, 1988; Tatum, 1999; Ziv, 1988). Because humor often plays with meaning, it helps individuals change their current mental perspective by visualizing problems in an alternate way, as well as engaging their critical thinking (Dormann & Biddle, 2006; Wanzer, Frymier, & Irwin, 2009). For instance, it has been demonstrated that message relevant word puns increase vocabulary because students must first recognize an incongruity in the message and then resolve or interpret it (Tatum, 1999; Wanzer, Frymier, & Irwin, 2009). For example, "Does the name Pavlov ring a bell?" is a play on words that is related to a famous psychologist, but requires students to remember who Pavlov is and remember his work with conditioning in order to understand the humorous twist. Thus, recall, retention, and comprehension skills are practiced while decoding the pun.

It is generally believed that humor is beneficial and is often advised as a best practice by effective teachers. However, aside from anecdotal, little evidence exists of its benefits (e.g.

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Ruggieri, 1999; Tatum, 1999). Most of the very little empirical work that has been conducted addresses students' and teachers' preferences, satisfaction, and perceptions of effectiveness and learning (Gorham & Christophel, 1990; Ziv, 1988). A very small number of studies have examined the effect of humor on relevant cognitive outcomes or in the actual classroom and most of the research on humor in higher education takes place in laboratory settings (Gorham & Christophel, 1990; Kaplan & Pascoe, 1977; Ziv, 1988). While there are notable exceptions, the majority of empirical research on how humor affects cognitive outcomes examines memory after hearing a speech or lecture (see Ziv, 1988 for review). For example, Garner (2006) found that students who listened to pre-recorded statistics lectures containing humor remembered significantly more material than the students who heard the exact same lecture, from the same professor, without humor. While this is a great addition to the literature, it lacks ecological validity, in which the study methods actually represent the real-life environment. Listening to a pre-recorded lecture lacks the social interaction available in an actual classroom. Moreover, asking a student to pay attention for one hour, in a lab setting, is not the same as asking them to pay attention for three hours a week throughout an entire semester in a classroom setting.

In addition, most of the research which has examined cognitive outcomes assesses recall and recognition levels of learning, which equates to the lowest level of Bloom's taxonomy of cognitive processing, the knowledge level (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). At the knowledge level of learning, the skill that is required for mastery is basic memorization, not an in-depth grasp or understanding of the material (Bloom, et al., 1956; Granello, 2001; Lord & Baviskar, 2007). To date, no known studies have assessed humor's effectiveness on Bloom's slightly higher levels of learning. The second of Bloom's levels, comprehension, denotes whether students have a basic understanding of the material (Granello, 2001; Lord & Baviskar, 2007). Comprehension assessments instruct students to translate, classify, or paraphrase information indicating an understanding of the intricacies of the material (Bloom, et al., 1956; Lord & Baviskar, 2007; Reid & McLoughlin, 2002). Bloom's third level of learning, application, indicates whether students can connect, practice, or demonstrate learned information in a new situation or setting (Granello, 2001; Lord & Baviskar, 2007).

Bloom's taxonomy is organized in a hierarchical fashion, with higher levels of thought not mastered until one has achieved lower levels (Bloom, et al., 1956). However, this does not mean that understanding of a construct will always be strongest at the lower levels of Bloom's taxonomy (e.g., knowledge). It is possible for one to have merely sufficient understanding of a construct at the knowledge level, but superior understanding of that same construct at higher levels of Bloom's taxonomy (e.g., comprehension, application). For instance, a student may not recall the name of a phenomenon, indicating poor success at the knowledge level, but may still be able to comprehend and apply that construct. As the higher levels of Bloom's taxonomy indicate more complex thought, it would be meaningful to evaluate humor's effects on learning beyond the knowledge level.

II. The Current Study.

The current study adds to the literature by exploring whether or not humor is beneficial in a classroom setting and enhances test scores on three levels of Bloom's taxonomy (i.e. knowledge, comprehension, and application). It was expected that humor would not only increase learning at the knowledge level—as has been previously demonstrated (e.g., Garner, 2006)—but also at the comprehension and application levels. Since, arguably, humor pushes students to connect

classroom material to new situations (Dormann & Biddle, 2006; Wanzer, et al., 2009) and these skills demonstrate comprehension and application, the following predictions were made:

Hypothesis 1. Students' quiz scores for constructs taught using humor would be significantly higher on all three levels of Bloom's taxonomy than students' scores for constructs taught without humor.

Furthermore, since classroom humor often requires translating, classifying, or paraphrasing course material, the same steps involved in comprehension, it may be that humor is especially likely to increase learning at the comprehension level.

Hypothesis 2. Constructs taught using humor would be most effective for the comprehension level of learning, as opposed to knowledge and application.

III. Method.

As part of a larger study, various constructs in a social psychology course were taught using humor. Student's learning was subsequently evaluated through six quizzes, which assessed learning on three of Bloom's cognitive levels: knowledge, comprehension, and application.

A. Participants.

The student body ($N = 51$) composition consisted of 18 males and 33 females (Mean age = 19.35, $SD = 0.76$). Two students were dropped from analyses due to incomplete records. The majority of students were Caucasian (58%), Hispanic (8%), and Asian (8%), African-American (2%), Bi-Racial (4%) and other (4%). The remaining 16% of students' ethnicity information was not completed.

B. Materials and Procedure.

The current study was a repeated measures design investigating learning through humor in the classroom. Over the duration of the semester, all students were exposed to various constructs that were taught either with humor or without humor, but in ways that were complementary to the personality of the instructor. That is, the instructor was free to use humor or to not use humor naturally to teach a construct, and constructs were not pre-assigned to a humor condition. For example, when students were presented with the various phases of relationship dissolution, a trailer for the comedy movie "The Break-up" was used to illustrate the phases. However, when students were taught the concept of self-esteem, no humor was used.

Prior to the beginning of the semester, a teaching assistant (TA), blind to the hypotheses, was trained to identify and code humorous attempts made by the instructor. The TA was instructed to code all of the instructor's attempts to be humorous, whether the attempt was successful or not. All attempts at humor were included in the analyses, even if the attempt was unsuccessful. Moreover, the TA was told that humorous attempts could be presented in puns, jokes, riddles, personal anecdotes, and multi-media (e.g. videos, songs, and comics). However, the type of humor presentation, and level of complexity within the humorous attempt itself, was not specifically coded. Across the semesters, approximately 40% of the constructs were taught with humor.

Two additional researchers, also blind to the hypotheses, created six quizzes to be administered approximately every three weeks. Each quiz assessed learning of four separate

constructs (e.g., fundamental attribution error, belief perseverance). A total of 24 concepts over the semester were each measured on knowledge, comprehension, and application levels of Bloom's taxonomy. Moreover, each quiz consisted of true/false, multiple choice, and short answer questions. Question types and level of Blooms taxonomy were independent of one another; for instance, short answer questions were used for all three levels indiscriminately.

Finally, two additional researchers, also blind to the hypotheses, graded the quizzes. Answers on each item were either marked as completely correct or completely incorrect. Blank or missing answers were marked as incorrect. No partial credit was awarded. The number of correct answers was combined for all quizzes and was then transformed into a total percentage correct for analysis.

IV. Results.

To test our hypothesis that students' scores for constructs taught using humor would be higher on all three levels of Bloom's taxonomy than students' scores for constructs taught without humor was supported. A 2 (Humor) X 3 (Bloom's level) repeated measures ANOVA was conducted. Results indicated a significant interaction ($F_{(2, 98)} = 7.02, p = 0.0014, \eta^2_p = 0.13$) of humor and Bloom's levels. Additionally, there was a significant main effect of humor ($F_{(1, 49)} = 18.10, p < 0.0001, \eta^2_p = 0.27$) and a significant main effect of Bloom's ($F_{(2,98)} = 7.23, p = 0.0018, \eta^2_p = 0.13$). See Table 1 for a summary of the means and standard deviations.

Table 1. Scores on constructs taught with humor or without humor.

	Humor		No Humor		<i>t</i> (49)	<i>p</i>
	M	SD	M	SD		
Knowledge	0.71	0.22	0.60	0.16	3.71	0.001***
Comprehension	0.80	0.20	0.67	0.12	4.05	0.000***
Application	0.66	0.24	0.69	0.16	-0.88	0.384
Total	0.72	0.16	0.66	0.11	3.17	0.003**

Note. Means are mean percentages, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

To investigate our second hypothesis that using humor would be most effective for the comprehension level of learning, pairwise t-tests for humor on each of the Bloom's levels was conducted. Results indicated that scores on Bloom's comprehension level were significantly higher than both knowledge ($t(49) = -2.36, p = 0.025$) and application ($t(49) = 4.16, p = 0.001$). However, knowledge and application levels were not significantly different from one another ($t(49) = 1.15, p = 0.25$).

V. Discussion.

Overall, students' scores for constructs taught with humor were higher than the scores of constructs taught without humor. Moreover, the results suggest that using humor is especially beneficial if the test items are on the knowledge and comprehension level of Bloom's taxonomy, but not for application level items. Further analyses indicated that humor was most effective for learning on comprehension level. This is not to suggest that students who performed better on comprehension level items lacked knowledge of the constructs being tested, but that their knowledge was sufficient to allow them to excel at higher levels of Bloom's taxonomy. These

findings support prior research findings that recall and recognition are enhanced through humor, but also provide new evidence that humor increases one's ability to understand the information.

Interestingly, our findings suggest that humor does not increase learning at the application level. The students performed equally well on the application questions, regardless of whether the construct was taught using humor. This is surprising as one would expect that humor would enhance students' ability to apply information because humor often involves using constructs in different situations. However, humor is often employed by showing a construct being misused or applied in a situation that is bizarre or inappropriate. While this allows individuals to be able to discern that the situation is inappropriate, it may not help them to practice the appropriate applications. Thus, learning on an application level may not be truly enhanced by this type of humor. Since type of humor was not coded in this study, thus we cannot test for these effects. One possibility is that riddles could lead to increased recall or knowledge, and humorous videos could lead to increased comprehension, while puns could be effective at increasing application skills. Future studies may want to code the types of humorous attempts in order to assess the cognitive impact of each attempt.

These findings are beneficial for the teaching and humor literature because they add empirical evidence in favor of humor as effective educational pedagogy. Although past research has provided some empirical evidence of the benefits of humor, only a few notable exceptions (e.g. Ziv, 1988) have tested the effectiveness of humor within the classroom context, using relevant cognitive outcomes. Thus, because the current study was conducted in a classroom setting, it has higher ecological validity than many past studies investigating the effectiveness of humor on learning that were conducted in the lab. Importantly, this study used a within subjects design, which allows the authors to rule out limitations resulting from comparing individual differences among instructors or course content.

Despite this benefit, limitations do exist in the current study. One limitation is that constructs were not randomly assigned to be taught using humor. As some constructs do not lend their selves to humor (e.g. aversive racism), the use of humor was left to the instructor's discretion, and used in natural, unscripted ways. This is a limitation because it denies the instructor the ability to control for the level of complexity of each humorous attempt. That is, some humorous attempts were 'plays on words' (e.g., Does Pavlov ring a bell?) while others were personal anecdotes containing sarcasm (a personal story involving eating an entire box of Oreos, while dieting, to demonstrate cognitive dissonance theory). Presumably, these humorous attempts are helping students exercise different levels of Bloom's taxonomy (knowledge and comprehension vs. application, respectively). It could be greatly beneficial if future studies could find a way to pre-assign humor to constructs, as well as control for complexity of the humorous attempt.

An additional limitation to the current study is that it is unknown whether the instructor's humor was directed more at knowledge, comprehension, or application levels of Bloom's taxonomy. In other words, was most of the humor that the instructor used at the knowledge level, the comprehension level, or the application level? Because the humor use was used in natural and unscripted ways, the cognitive level of the humor was not controlled for. Additionally, this information was not coded by the research assistant in the classroom. Future research should investigate different types of humor to determine if humor directed at different cognitive levels actually helps to enhance learning at those levels.

Finally, there was a lack of control over extraneous variables since this study was conducted in a classroom environment. As with any study containing ecological validity, there is

an increased chance that the independent variable may be confounded with other variables (e.g., student attention, class attendance). However, it is unlikely that our findings were caused by an extraneous variable, as our results corroborate existing laboratory research showing a robust relationship between humor and learning outcomes (Garner, 2006).

Past literature suggests that humorous teachers are perceived as more effective (Fortson & Brown, 1998; Downs, Javidi, & Nussbaum, 1988; Norton & Nussbaum, 1980.) But, some instructors are uncomfortable using humor in the classroom and it may take an experienced instructor to purposefully incorporate humor into one's verbal repertoire (Fortson & Brown, 1998). However, one does not have to be an experienced comedian to effectively incorporate humor into one's teaching strategies. For example, there are many movie clips, television shows (e.g. episodes of *The Office* to show self-monitoring, or the lack thereof), commercials (e.g. parodies of Snuggie ads to show exaggerated influence techniques) or even songs (e.g. "White and Nerdy" by Weird Al Yankovic to illustrate stereotypes) that are humorous and can be used. Thus, the instructor does not have to rely on his or her own comedic value, but can borrow from other sources instead.

In conclusion, the present study demonstrates that the use of humor is cognitively beneficial in the classroom. The findings indicate that overall performance was enhanced when using humor in the classroom, with a particular advantage for concepts tested at the comprehension level of assessment. Thus, it is possible to enhance classroom learning with the added benefits of minimizing boredom. And, all kidding aside, that is a win-win for instructors.

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