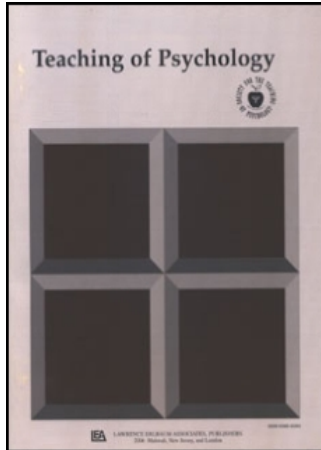


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Keeping It Short and Sweet: Brief, Ungraded Writing Assignments Facilitate Learning

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Can short, ungraded, free-writing assignments promote learning of course material? We randomly assigned introductory psychology recitation sections (N = 978 students) to writing or thinking conditions. For all sections, teaching assistants presented students with a discussion topic based in current coursework. Students either wrote or thought about the topic for 5 min. All sections then discussed the topic for approximately 10 min. Exams included questions related to the discussion topics. Students in the writing condition attended class more often and performed better on factual and conceptual multiple-choice exam questions than students in the thinking condition, even after controlling for measures of student quality. The results suggested that brief free writing improved factual and conceptual learning.

Active learning, described as more learner- than content-centered, leads to better retention of course material than passive learning and includes such techniques as writing and class discussion (Yoder & Hochevar, 2005). Writing promotes critical and flexible thinking, develops expressive abilities, facilitates reflecting on course content, and encourages students to develop their own perspectives (Bensley & Haynes, 1995; Wade, 1995; Waller, 1994). Classroom discussion provides many similar benefits, including promoting and modeling critical thinking and developing expressive abilities (Connor-Greene, 2005; Dallimore, Hertenstein, & Platt, 2004; King, 1995). Despite these benefits, incorporating active learning techniques into the classroom is not necessarily easy. Writing assignments are often perceived as onerous for students to carry out and for educators to grade (Madigan & Brosamer, 1991). Common concerns about holding classroom discussion include the many students who are reluctant to participate and the quality of students' responses (Connor-Greene, 2005; Dallimore et al., 2004).

Our study evaluated the combination of nononerous in-class writing and related class discussion. The writing component builds on the minute-paper technique described by Angelo and Cross (1993). Minute papers entail students' writing for several minutes in class in

response to a specific question, such as what students found unclear or most valuable from a previous lecture (Angelo & Cross, 1993; Dunn, 1994). Minute papers confer many of the benefits of writing described earlier (Stead, 2005). In addition, because minute papers are not graded, students are more likely to focus on content and clarity of expression, rather than formal aspects of writing, such as spelling and grammar (MacKinnon-Slaney, 1991).

Little research has examined modifications of the minute-paper technique. A notable exception (Butler, Phillmann, & Smart, 2001) combined minute papers and the think-pair-share technique to create CARDS, so named because students use index cards with this strategy. Specifically, students write responses to a question that addresses a specific psychological concept, exchange responses with partners, and discuss responses in small groups. Students who used cards performed better on one third of the multiple-choice exam questions that were linked to cards' topics than students who were exposed to the same materials but did not use cards (Butler et al., 2001). Other research suggests that the combination of brief writing with discussion may be more effective pedagogically than discussion alone. For instance, class discussion can be facilitated by having students prepare questions (Carroll, 2001) and talking points prior to class (Connor-Greene, 2005).

Our study expanded on previous research in several ways. First, we used the minute-paper technique with topics typically reserved for discussions and for which there are no "right" answers. We designed the questions to require synthesis of material presented in the lecture and text and permitted inclusion of opinions. Second, students' writing occurred within the classroom, which minimized problems associated with preparing and bringing responses to class. Third, only teaching assistants saw the students' responses, which avoided concerns about peer review of written work. Fourth, we examined student learning using questions that tapped both factual and conceptual understanding of course material. Fifth, we compared the combination of brief writing and discussion with time to think about

the topic and discussion. The primary analyses tested whether students who wrote minute papers and had discussions would perform better on questions related to the minute-paper topics than students who had time to think and heard a discussion, but did not write about the topic.

Method

Participants

Nine hundred seventy-eight undergraduate students (37% men; 67% freshmen, 19% sophomores, 10% juniors, 4% seniors and beyond) in an introductory psychology course at Temple University participated as part of their coursework during the Fall 2004 and Spring 2005 semesters. Temple University is a large, urban university in Philadelphia with a diverse student population (approximately 58% White, 19% African American, 9% Asian American, 4% Latino/a, 10% other). Participating students averaged 1046.06 (± 127.35) on their SATs.

We divided students among 32 recitation sections. Four graduate teaching assistants (TAs) each taught four recitation sections in the fall and in the spring. Of those four recitation sections in a given semester, we randomly assigned two to the writing condition and two to the thinking condition. Thus, each TA taught two sections that included minute papers and two sections that did not. This assignment resulted in 16 sections that used minute papers ($n = 512$ students) and 16 sections that did not use minute papers ($n = 466$ students).

Procedure

Four professors team-taught the introductory psychology course during a 14-week semester. The first 2 weeks provided an overview of psychology. The remaining 12 weeks included three content sections: developmental, clinical, and social psychology. Each week, students attended two lectures by a professor and one recitation led by a TA.

Writing topics centered on expressing opinions about current controversies in the field, applying course content to everyday experiences, and choosing and supporting a position after presentation of competing viewpoints (Dunn, 1994; Rickabaugh, 1993; Waller, 1994). We selected nine discussion topics based on course content, three for each of the three content sections. For example, one topic for the social psychol-

ogy section involved stereotypes. The TAs presented students with a statement that perhaps some stereotypes may be helpful; for instance, if a student belongs to an ethnic group that is associated with the stereotype that the ethnic group does well academically, this stereotype may lead the student to work harder. The TAs asked students to provide their opinion regarding the implications of selectively seeking to eliminate negative versus all stereotypes.

For each topic, the TAs read the same brief introduction to the topic. The TAs then instructed students in the writing condition to write for 5 min. In the thinking condition, the TAs read the same introduction and then told students to think about the topic for 5 min. In both cases, the TA followed the 5 min of writing or thinking with 10 min of class discussion of the topic. Students in the writing condition received 1 point for each minute paper. In the thinking condition, students received 1 point for attending recitation for the weeks in which the TAs administered minute papers. Thus, we provided the same amount of credit in both the writing and thinking conditions to ensure that students' motivation for attending recitations would not be differentially affected in the two conditions.

Students took multiple-choice exams after each of the three content sections. Each exam included six target questions, two questions for each of the three topics students wrote or thought about, for a total of 18 target questions during the semester. One question was fact-based; for instance, four statements followed the stem, "A stereotype is . . ." one of which provided the correct definition. The second question was conceptual in nature. For example, selecting the correct answer to the stem, "We are more likely to make positive stereotypes about . . ." required applying knowledge of in- and out-group processes. We classified questions as factual versus conceptual based on designations provided by the textbook's test bank (Russell, 2005) used in constructing the exams. We used students' percentage correct for the nine factual and nine conceptual questions summed over the three exams as the dependent variable.

Results

Preliminary analyses indicated that the writing and thinking conditions did not differ with regard to sex, year in college, or SAT scores (see Table 1). Because the dependent variable in the study involved exam performance in the introductory psychology course, we calculated the semester grade-point average (GPA)

Table 1. Means and Comparison Statistics for Writing and Thinking Conditions

Variable	Writing Condition	Thinking Condition	Comparison Statistic	<i>p</i>
Sex (% men)	37%	36%	$\chi^2(1, N = 978) = 0.20$.66
Year in college (% freshman) ^a	65%	69%	$\chi^2(4, N = 978) = 8.09$.09
SAT	1042.30 (129.27)	1050.19 (125.23)	$t(976) = 0.97$.33
Semester GPA	2.91 (.67)	2.82 (.70)	$t(976) = 2.24$.03
Semester GPA excluding introductory psychology course	2.98 (.68)	2.89 (.73)	$t(976) = 1.93$.053
Proportion of recitations attended	.85 (.17)	.82 (.19)	$t(976) = 2.52$.01
Proportion of factual questions correct	.66 (.16)	.63 (.17)	$t(976) = 2.75$.006
Proportion of conceptual questions correct	.60 (.32)	.55 (.28)	$t(976) = 2.28$.02

Note. Proportion scores can range from 0 to 1.

^aThe χ^2 statistic reflects a comparison of five levels of year in college: freshman, sophomore, junior, senior, and beyond senior (> 120 credits).

with and without this course. Groups differed on semester GPA when we included the introductory psychology course, and group differences approached significance when we excluded the course. Groups differed with regard to percentage of recitations attended and percentage correct on both factual and conceptual questions (Table 1).

To control for student quality and attendance, we conducted two ANCOVAs using (a) percentage correct for factual questions and (b) percentage correct for conceptual questions as dependent variables. We conducted group comparisons (writing vs. thinking) with three covariates: attendance, semester GPA, and SAT scores. To avoid confounds with the dependent variables, we covaried semester GPA excluding the introductory psychology course in the analyses reported subsequently. We repeated these analyses covarying semester GPA including the introductory psychology course; the pattern of findings remained the same.

For the model involving percentage correct of factual questions, three variables were significant: group, $F(1, 970) = 5.79, p = .016$; semester GPA, $F(1, 970) = 41.07, p < .001$, and SAT scores, $F(1, 970) = 5.39, p = .02$. Attendance was not significant, $F(1, 970) = .45, p = .50$. For the model involving performance on conceptual questions, the effect of group was significant, $F(1, 970) = 6.39, p = .012$. However, none of the covariates was significant: semester GPA, $F(1, 970) = .47, p = .49$; SAT scores, $F(1, 970) = .80, p = .73$; or attendance, $F(1, 970) = 2.96, p = .09$. Thus, students in the writing condition performed better on factual and conceptual questions than students in the thinking condition even after accounting for class attendance, semester GPA, and SAT scores.

Discussion

These results suggest that in-class writing and discussion improved performance on factual and conceptual multiple-choice exam questions, beyond any gain from time for in-class thinking and discussion. Although the effect sizes for the group differences were small ($\eta = .08$; Cohen, 1988), we must emphasize that those differences were not accounted for by student quality or attendance and that we structured the study to minimize differences between the two conditions. Specifically, in both writing and thinking conditions, TAs encouraged and provided the students time to think about the topic and participate in a class discussion. This commonality in dealing with the material across conditions makes even more noteworthy our finding of a difference in students' performance. Put differently, just 5 min of writing on a topic per week (45 min per semester) produced significantly higher scores on test items than did the same amount of time spent thinking.

Any conclusions should be interpreted in light of the study's limitations. First, we randomly assigned sections, not individuals, to conditions. Second, we assigned credit based on different behaviors between conditions (attendance in the thinking condition and writing in the writing condition). Third, it is not clear whether students in the thinking condition used the 5 min allotted to actually think about the material prior to the discussion.

Future research should be designed to better capture the processes by which students actively think about and integrate material. Examples are contrasting in-class writing and in-class thinking without discussion time, altering time spent in discussion, and using a within-subject design. Other research might explore

variables related to more efficient learning or more student satisfaction. For instance, writing about personal experiences may be more likely to stimulate student involvement (Counce, 1995). In addition, using a sequence of topics that is increasingly more challenging could allow students to take more responsibility over time for critically evaluating and supporting their own arguments (Stoddart & Loux, 1992).

This research demonstrates that a technique within reach of most course instructors can produce significant improvement in students' performance. Indeed, minute papers are relatively simple to administer, do not require much preparation time or grading, and are amenable to different classroom contexts and topics. Furthermore, it is reasonable to assume (although at present we have no evidence to support such an assumption) that if students had spent more time writing, we might have found larger scale improvements in performance.

Most educators recognize the importance of active learning techniques, such as writing and discussion (Yoder & Hochevar, 2005). The development of good writing and verbal expressive skills is critical to students' careers, and writing and discussion enable students to reflect, critically evaluate, and apply information. When so many faculty teach large classes and have other time-consuming research and service duties, it may be too much to ask that traditional essay papers be assigned, critiqued, and graded. Our study indicates that brief, in-class, ungraded free writing improves integration and application of course material. Because of the relative ease with which faculty can incorporate this technique into the classroom, such assignments can be a valuable means of promoting the skills and benefits that writing and discussion confer.

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Notes

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