

The Relationship Between Exam Completion Time and Exam
Score in an Introductory Animal Science Course

Leah McDannell
mcdannell.1@osu.edu
Department of Animal Sciences
The Ohio State University

Pasha A. Lyvers Pepper
lyvers-pepper.1@osu.edu
Associate Professor
Department of Animal Sciences
The Ohio State University
Columbus, Ohio 43210

Table of Contents

Contents.....	2
Abstract.....	3
Introduction.....	3
Materials and Methods.....	4
Results and Discussion	5
Literature Cited.....	8

*The Relationship Between Exam Completion Time and Exam Score
in an Introductory Animal Sciences Course*

Abstract

To better assist educators in giving advice to students on examination completion methods, this study aimed to explore the relationship between the time a student uses to complete an exam and the score the student receives on that exam. This study analyzed exams from an introductory animal science course, taught by the same professor, offered within the Department of Animal Sciences within the College of Food, Agricultural, and Environmental Sciences (CFAES) during three different terms. The objective of this study was to determine the correlation between the amount of time students spend on an exam and the score received. This study also considered the effects of gender, rank, and educational plan on the scores received on these exams. It was hypothesized that students completing the exam with an intermediate submission time would score higher than students completing the exam with an early or late submission time. The purpose of this study was to allow educators in a natural sciences course to better advise students on exam taking techniques. Analysis showed no significant difference in any of the above categories except for on one exam. Students with a major within CFAES that was not Animal Sciences took longer to complete the final exam than did students of an Animal Sciences major or a major outside of the college.

Introduction:

A common area of interest in the academic community is factors affecting exam performance. The amount of time students spend on an exam is of particular interest and knowledge concerning this may influence how students are advised on time management during examinations. While some studies advise that students take their time, others advise that students complete the exam as quickly as possible (Landrum et. al., 2009). Additional studies have found that students with exam completion times in the middle third scored better than

students on either end of the allotted time (Bridges, 1985). Furthermore, the speed at which students complete and submit an exam can impact the anxiety experienced by other students in the course (Herman, 1997). Students often seek the advice of their educators on time management during exams. The relationship between exam completion time and exam performance has been studied in psychology (Bridges, 1985; Herman, 1997; Landrum et. al., 2009) and business (Beaulieu and Frost, 1994) disciplines. To our knowledge, similar studies have not been completed in a natural sciences course. To this end, exams were collected over the course of three years and exam completion times and exam scores recorded. The purpose of the study was to determine if the two variables were correlated, which could impact how students are advised with respect to time management when completing exams in a natural sciences course.

Materials and Methods

Time elapsed between student exam receipt and student exam submission was determined in an introductory animal sciences course between 2009 and 2011. Students (n=239) completed three exams per term (two mid-terms and one final) for a total of 717 exams collected. Mid-term exams were allotted 48 minutes for completion and the final exam was allotted 78 minutes for completion, though the exam was of the same length.

Time elapse for exam completion was recorded for individual exams completed by exam. Exams were mixed format consisting of multiple-choice, fill-in-the-blank, matching, and short answer questions. Scores were recorded for each exam as a component of the course. Demographic information was obtained from enrollment records and included: gender, major, minor, rank, and specialization when applicable. Data was coded and no identifying information was included in the data analysis. The frequency procedure of SAS (version 9.1; SAS, Cary, NC) was used to determine frequency of students by demographic information obtained and

course requirement for major or minor declarations. Majors and minors of low frequency were categorized as other. Majors categorized as other included: Agribusiness, Food Science and Nutrition, Food, Agricultural, and Biological Engineering, Agricultural Systems Management, Radiologic Sciences and Therapy, Film Studies, Psychology, Chemical Engineering, Molecular Genetics, Speech and Hearing Science, Agricultural Communication, Communication, German, International Studies, Crop Science, Business Administration, Business-Accounting, Microbiology, Anthropology, Human Nutrition, Medicine, and Continuing Education. Minors categorized as other included: Agribusiness, Psychology, Spanish, Engineering Sciences, Agricultural and Extension Education, Education, Animal Nutrition, International Studies, Crop Science, General Business, Business Administration, Agricultural Systems Management, Speech and Hearing Science, Music, Human Development and Family Science, Professional Writing, and Sociology. Mean exam scores and exam completion times were compared by ANOVA using the general linear model procedure of SAS (version 9.1; SAS, Cary, NC). Association between average exam score and average exam completion time (recorded as a percent of time used relative to total time allotted) was determined by correlation analysis.

Results and Discussion

The majority of the students were female (75.31%; Table I) and is consistent with Hoover and Marshall (1998), who also found that the majority of students enrolled in selected animal sciences courses were female. This is in contrast to earlier reports (Mollett and Leslie, 1986), which stated an even distribution between the genders within the Animal Sciences major. Also consistent with Hoover and Marshall (1998), the majority of the students

Variable	Number	Percent
Gender		
Female	180	75.31
Male	59	24.69
Rank¹		
Freshman	76	31.93
Sophomore	89	37.39
Junior	50	21.01
Senior	23	9.66

¹ Rank determined from enrollment records, rank 1, 0-30 h completed; rank 2, 30.5-60 h complete; rank 3, 60.5-90 h completed; rank 4, 90.5 h and greater.

enrolled in the course had a major declaration of Animal Sciences (77.73%; Table II). At 48.98%, the most frequent declared specialization was Pre-Veterinary Medicine, which is consistent with the findings of Mollett and Leslie (1986). In regards to male and female students enrolled, with exam score averages of 68.3% and 69.7%, respectively, there were no significant differences between males and females in the average scores received on the exams (Table III). There was no difference between overall exam score received by students completing the course as a requirement of the major or minor (Table III); however, students with majors within CFAES took an average of twenty percent longer to complete the final exam than students with a major declaration of either Animal Sciences or major declarations outside of CFAES (Figure I). It should be noted, however, that there were a limited number of CFAES students with non-Animal Sciences majors (n=7). Lastly, the average time to complete an exam was not associated with the average exam score (R=0.1; Figure II).

TABLE II: Enrollment of students in an introductory animal sciences course by major requirement, minor requirement (CFAES), or not required and specialization.

Variable	Number	Percent
Requirement¹		
Animal Sciences	185	77.73
CFAES	7	2.94
Not Required	46	19.33
Specialization		
Pre-Medicine	2	0.84
Pre-Veterinary Medicine	117	48.95
Undeclared	120	50.21

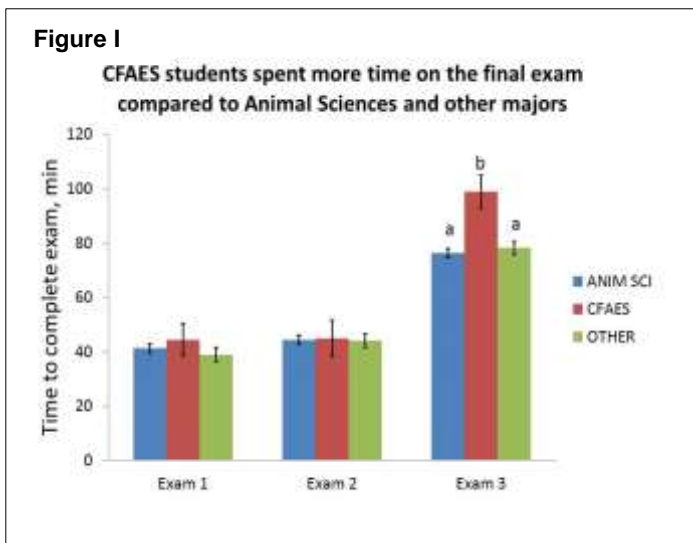
¹Introductory Animal Sciences fulfills a Natural Sciences GE in Biological Sciences for non-majors

TABLE III: Average exam score of students enrolled in an introductory animal sciences course by gender or course requirement.

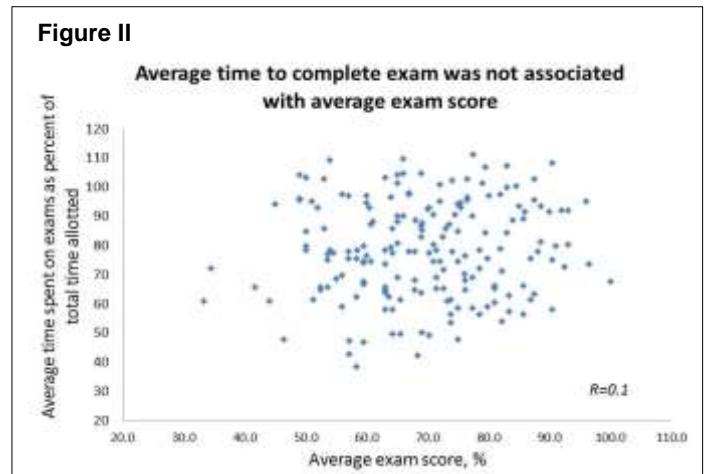
Variable	n	Grade, % ¹	Standard Error
Gender			
Female	180	69.7	1.89
Male	59	68.3	2.22
Requirement			
Animal Sciences	185	69.9	1.10
CFAES	7	71.5	4.88
Not required ²	46	65.5	1.96

¹ Values are means ± SEM.

² Introductory Animal Sciences fulfills a Natural Sciences GE in Biological Sciences for non-majors.



This study supports the findings of Bridges (1985) and Beaulieu and Frost (1994) and failed to show a relationship between exam completion time and exam score. The results of the study are based on a mixed-format exam and it is not known if similar findings would occur for multiple-choice only exams, short answer only exams, and essay response only exams. Though the factors contributing to exam completion times remains of interest, these factors remain largely unknown.



Literature Cited

- Beaulieu, R. P., & Frost, B. Another look at the time-score relationship. (1994). *Perceptual and Motor Skills*, 78, 40-42.
- Bridges, K. R.. Test-completion speed: Its relationship to performance on three course-based objective examinations. (1985). *Educational and Psychological Measurement*, 45, 29-35.
- Herman, W. E.. The relationship between time to completion and achievement on multiple-choice exams. (1997). *Journal of Research and Development in Education*, 30(2), 113-117.
- Hoover, T. S., & Marshall, T. T.. A comparison of learning styles and demographic characteristics of students enrolled in selected animal science courses. (1998). *J. Anim. Sci.*, 76, 3169-3173.
- Landrum, R. E., Carlson, H., & Manwaring, W.. The relationship between time to complete a test and test performance. (2009). *Psychology Learning and Teaching*, 8(2), 53-56.
- Mollett, T. A., & Leslie, E. K.. Demographic profile of students majoring in animal science. (1986). *NACTA Journal*, March, 26-29.