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Variables Associated with Course Completion Status and Final Course Grade in an Introductory Animal Science Course

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Introduction

Introduction

- Data were collected as part of departmental assessment.
- Departmental assessment plan:
  - Collect and analyze data on students in two Animal Science courses over 5 years.
    - Domestic Animal Biology (ASC 101)
    - Capstone in Animal Agriculture (ASC 470)

Introduction

- ASC 101: Domestic Animal Biology
  - Required for Animal Science, Equine Science and Management, and Agricultural Education majors.
  - Taxonomy, anatomy, physiology, nutrition, reproduction, genetics, behavior
  - Lecture and Lab
  - 3 credits

Introduction

ASC 101 Course Grade Breakdown:

Graded Item	Point Value
Quizzes	10 (100 total)
Homework Assignments	10 (70 total)
Laboratory Exercises	10 (110 total)
Exams	100 (200 total)
Lab Practical	100 (100 total)
Cumulative Final	150 (150 total)
Bonus	30 total

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Materials and Methods

Objectives

In an introductory animal science course, what factors are associated with…

Receiving a high or low course grade?

Remaining enrolled or dropping/withdrawing?

Age?

Community Type?

Prior Knowledge?

Critical Thinking Skills?

High School GPA?

Degree?

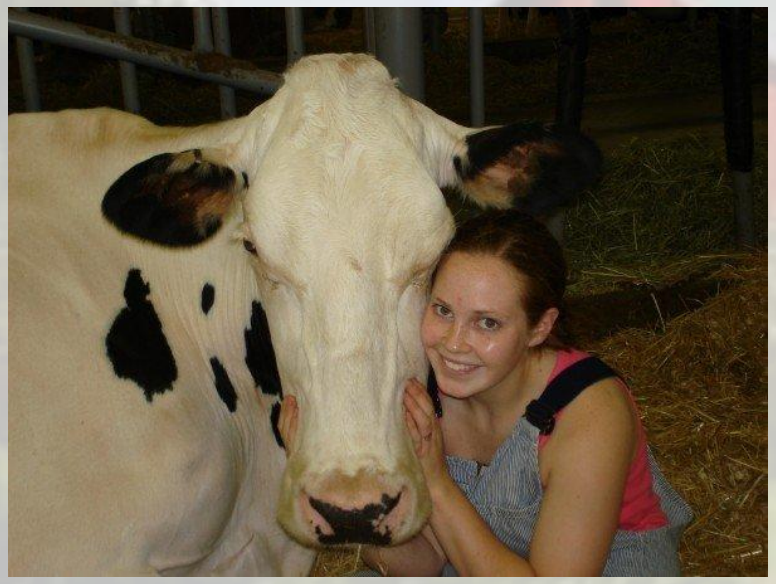
Agricultural Club Participation?

Gender?

Prior Agriculture Classes?

Working Hypothesis

Specific explanatory variables are associated with course withdrawal and course grade percentage.



Materials and Methods

- Assessment tools administered:
  - Demographic Survey
  - California Critical Thinking Skills Test
  - Background knowledge test
- Outcomes recorded:
  - Dropping/withdrawing versus remaining enrolled in the course
  - Course grade percentage

Materials and Methods

- Demographic Survey
  - 15 questions
  - Information on demographics and agricultural background
- Background knowledge test
  - 20 questions
  - Nutrition, reproduction, genetics, anatomy, etc.

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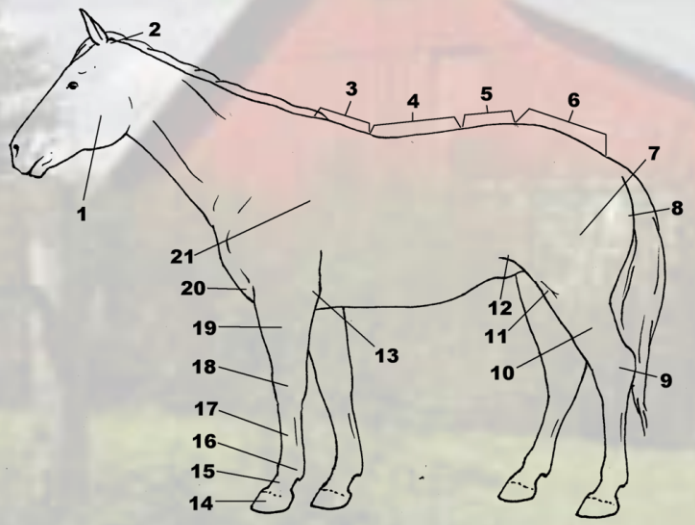
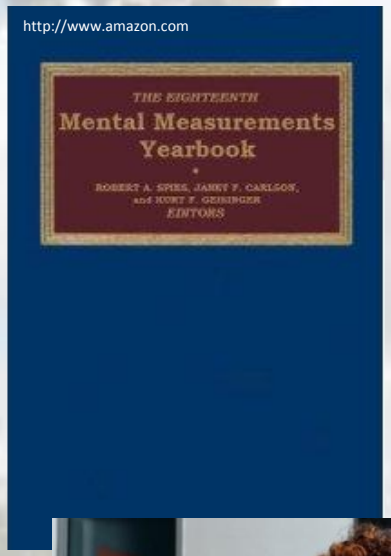


Materials and Methods



- CCTST (Form 2000)
  - Population: College students and adults.
  - Questions: 34, multiple choice.
  - Questions are not discipline-specific.

Statistics

N=405 (after 20 subjects excluded).

Characteristics of sample:

frequencies, means calculated for each variable.

<u>Multiple Logistic Regression</u>

- Purpose: find variables associated with dropping/withdrawing from course.
- Approach:
  - Categorized by course completion status.
  - Chi-squared test of independence or Wilcoxon rank-sum test, $p<0.25$.
  - Manual input of variables (SAS 9.2).
  - Model fit checked using Hosmer-Lemeshow test.

Statistics

- Multiple Linear Regression
  - Purpose: find variables associated with final course grade percentage.
  - Approach:
    - Plots and one-way ANOVA tests used to identify potential explanatory variables .
    - Variables suspected of displaying multicollinearity checked using chi-squared tests of independence and variance inflation factor.
    - Distribution of residuals plotted.
    - Manual input of variables for impact on R^2.

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Results and Discussion

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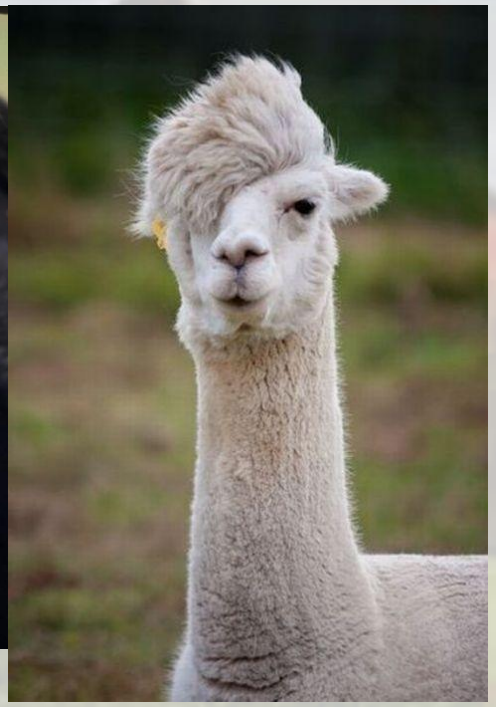


Results: Multiple Logistic Regression

Outcome: Dropping/withdrawing from course.

Variable	Adj. Odds Ratio Estimate	95% CI
Location Lived In *(KY vs. other)*	2.37	1.07, 5.24
HS GPA *(<3.0 vs. >3.5)*	3.84	1.34, 10.99
HS GPA *(3.0-3.49 vs. >3.5)*	2.29	1.01, 5.20
Age *(by year)*	1.15	1.03, 1.27
Year *(2010 vs. 2011)*	2.37	1.08, 5.21

AUC=0.72

Hosmer-Lemeshow p=0.15

Results: Multiple Linear Regression

Outcome: Course grade percentage.

Variable	Adj. parameter estimate	95% CI
Intercept	80.08	75.51, 84.65
CCTST Percentile <34	-9.67	-12.88, -6.47
CCTST Percentile 34-66	-5.43	-8.39, -2.48
High School GPA <3.0	-6.74	-11.52, -1.96
High School GPA 3.0-3.49	-5.24	-8.04, -2.44
Urban	3.16	-1.49, 7.80
Suburban	5.90	2.69, 9.11
Rural Nonfarm	6.65	2.83, 10.48
Agricultural Clubs	4.45	1.74, 7.15
Public High School	-3.78	-6.94, -0.61
Year (forced)	-1.85	-4.35, 0.65

R^2=0.24

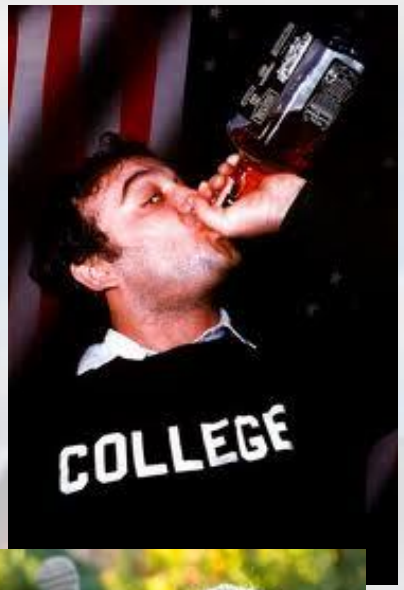
Discussion: Course Withdrawal

- Location Lived In
  - Investment in course? Educational differences?
- High School GPA
  - Maintenance of study skills?
- Age
  - Time constraints?
- Year
  - Students in 2011 surveyed several weeks later than 2010.

Dyer and Breja (1999): Ag. clubs and high school ag. classes associated with intent to complete college ag. degree.

Discussion: Course Grade

- CCTST
  - Problem solving ability reflected by grade?
- Community Type
  - Educational or socioeconomic differences?
- High School GPA
  - Academic skills/study habits?
  - Garton et al. (2005) found similar for cumulative GPA upon degree completion.



Discussion: Course Grade

- High School Type
  - Preparation level, socioeconomic factors?
- Agricultural Clubs
  - Motivation, interest level, knowledge level?
    - Multicollinearity with Background Knowledge Test.
  - Other authors found gender (McMillan et al. 2009) or major (Peffer, 2011) to be associated with final course grade in undergrad. animal science courses.

Conclusion

- Variables associated with course completion status and course grade percentage identified.
- Logistic regression model showed some predictive ability for course withdrawal.
  - Variables: Location lived in, high school GPA, age, year.

Conclusion

- Linear regression model explained some variability in course grade.
  - Variables: CCTST, high school GPA, high school type, community type, agricultural clubs.
- Further study needed to determine why variables were associated.

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