# Statistical Data Analysis of Student Goals

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*November 4, 2019*

## 1 Abstract

*This should be a very brief explanation of your research paper (around 150 words). It normally includes information about the issue, why you are interested in that issue, your method/model, analysis results, discussions and conclusions.*

This paper analyses the data gathered from surveying 625 undergraduate students. The authors of the survey tried to prove two hypothesis: 1) During students' junior years, they tend to primarily focus on getting good grades while during their senior years, the focus shifts towards a deep-understanding of the subject and 2) students' enjoyment and interest tends to deteriorate as they progress through their studies. It is not obvious why this might be the case and if the student's age, sex or studied subject has any bearing. This is why the survey has 15 questions and probes 7 assessment categories. Each category consists of 3 to 1 questions and because the order of the questions is randomised, the student should not know the categories nor notice any patterns.

In this paper a full analysis of the gathered data will be presented, including data: preparation, analysis, exploration and interpretation; calculation of confidence intervals, interpretation of the results using different kinds of graphs and an explanation of the methods used.

## 2 Introduction

*This section should explain the topic, why it is important, and how you approach the issue*

It is interesting how undergraduate students' goals change through-out their studies. A formal analysis started with an interpretion of the 7 categories based on the questions they consisted of. The results are presented in the table below:

| Category | Interpretation | Question | # of Questions |
|---|---|---|---|
| Performance approach | How important it is to students to do better than others? | 1, 2, 3 | 3 |
| Performance avoidance | How motivated are students by fear of performing poorly? | 4, 5, 6 | 3 |
| Mastery approach | Prevalence of mastery approach | 7, 8, 9 | 3 |
| Mastery avoidance | Student's fear of not mastering the course | 10, 11, 12 | 3 |

| Category | Interpretation | Question | # of Questions |
|---|---|---|---|
| Interest | Student's expectations whether the course will be interesting | 13 | 1 |
| Enjoyment | Student's expectations whether the course will be enjoyable | 14 | 1 |
| Importance focus | Student's importance focus on understanding and grades | 15 | 1 |

Because *Interest*, `Enjoyment` and `Importance focus` categories consisted only of one question, no further action was required to be able to interpret data. For the remaining categories, which number of questions was equal to 3, a mean for each assessment category was computed and saved for each individual student.

The students answered on a 7-level scale; 1 meaning the student feels the statement asked in the quesion is 'Not true of him/her' and 7 meaning the student feels it is 'Very true of him/her'. See the table below for a graphical explanation:

| Not true of me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very true of me |
|---|---|---|---|---|---|---|---|---|

To test the hypotheses, This resulted in 4 extra columns added to the original data set, since Interest, Enjoyment and Importance category consisted only of 1 question. An example of the new columns and their contents can be seen below:

| m1 | m2 | m3 | m4 |
|---|---|---|---|
| 4.666667 | 4.333333 | 6.000000 | 3.333333 |
| 2.333333 | 2.333333 | 5.000000 | 2.000000 |
| 3.666667 | 1.333333 | 5.666667 | 1.333333 |
| 3.666667 | 3.666667 | 6.000000 | 5.333333 |
| 3.333333 | 3.333333 | 7.000000 | 4.000000 |

An exploratory data analysis using graphs was performed. Some of the worth mentioning are:

# 3 Data

*Explain your dataset and how the was data is collected – e.g. your sampling strategy or information given by the project information.*

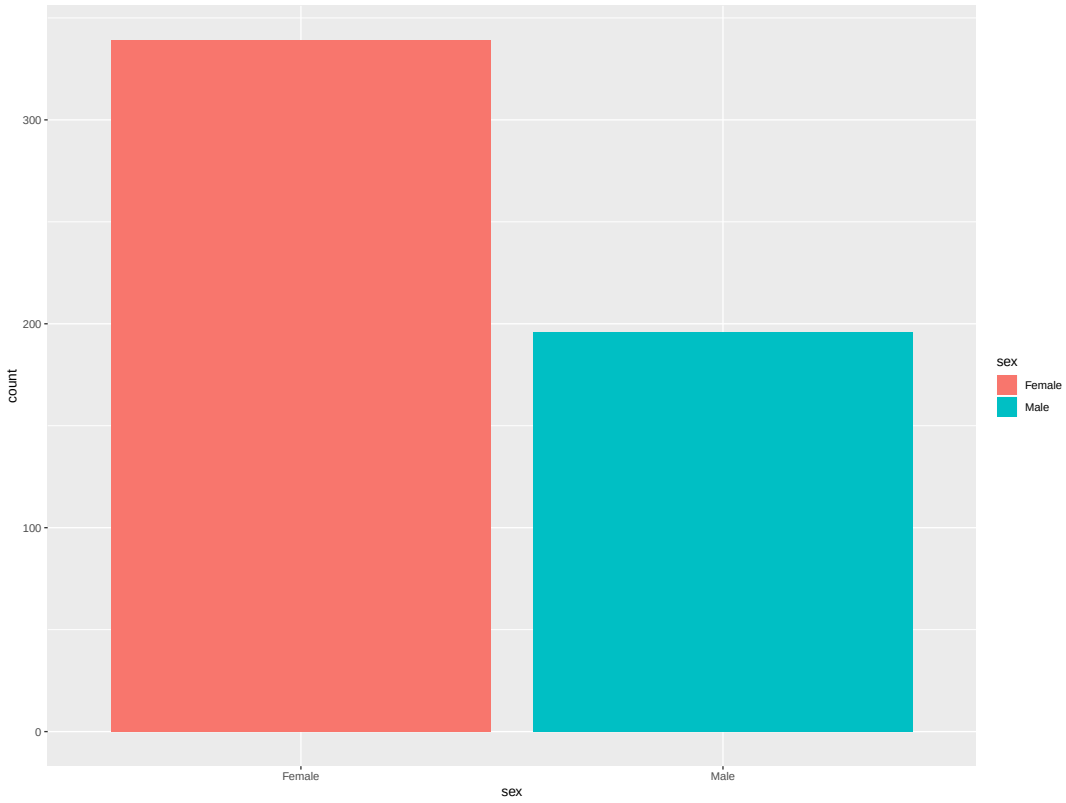



Figure 1: plotting example

Around 625 students were surveyed. To conceal the existence of the 7 categories from students, they were presented with the questions in random order.

# 4 Methodology

*This section explains the statistical methods and/or your model. It is also a common practice to present the statistical model structure (i.e. equation) here as well.*

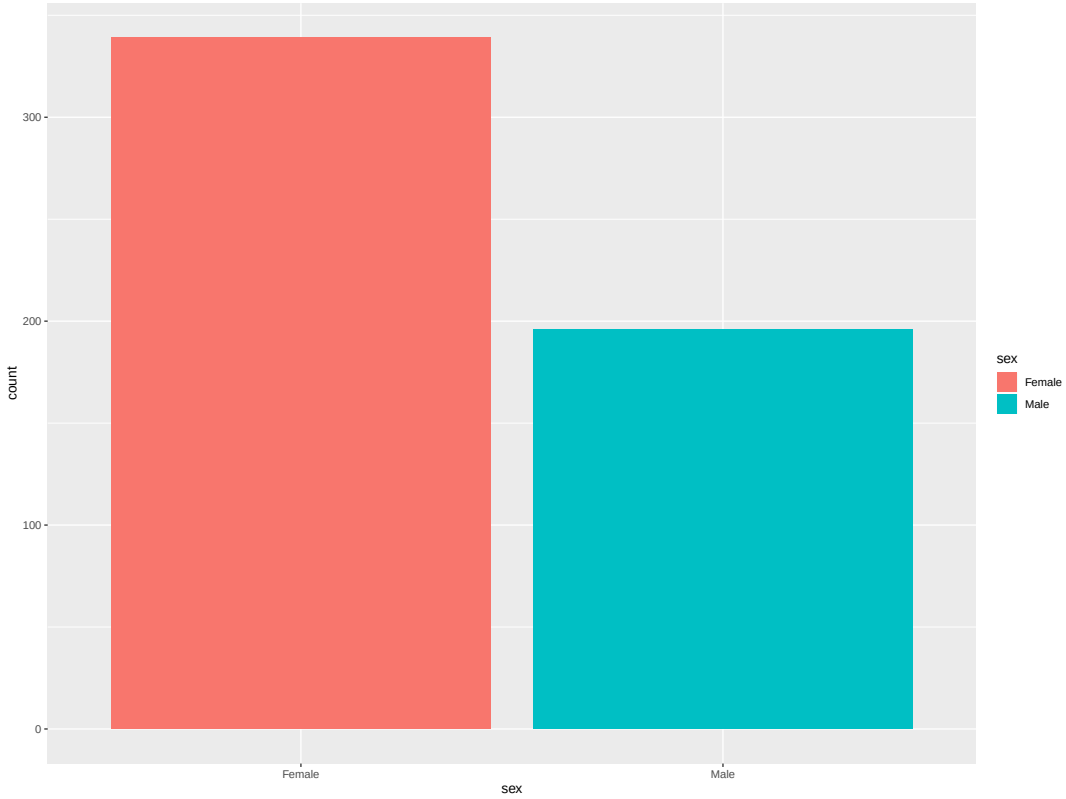
https://ggplot2.tidyverse.org

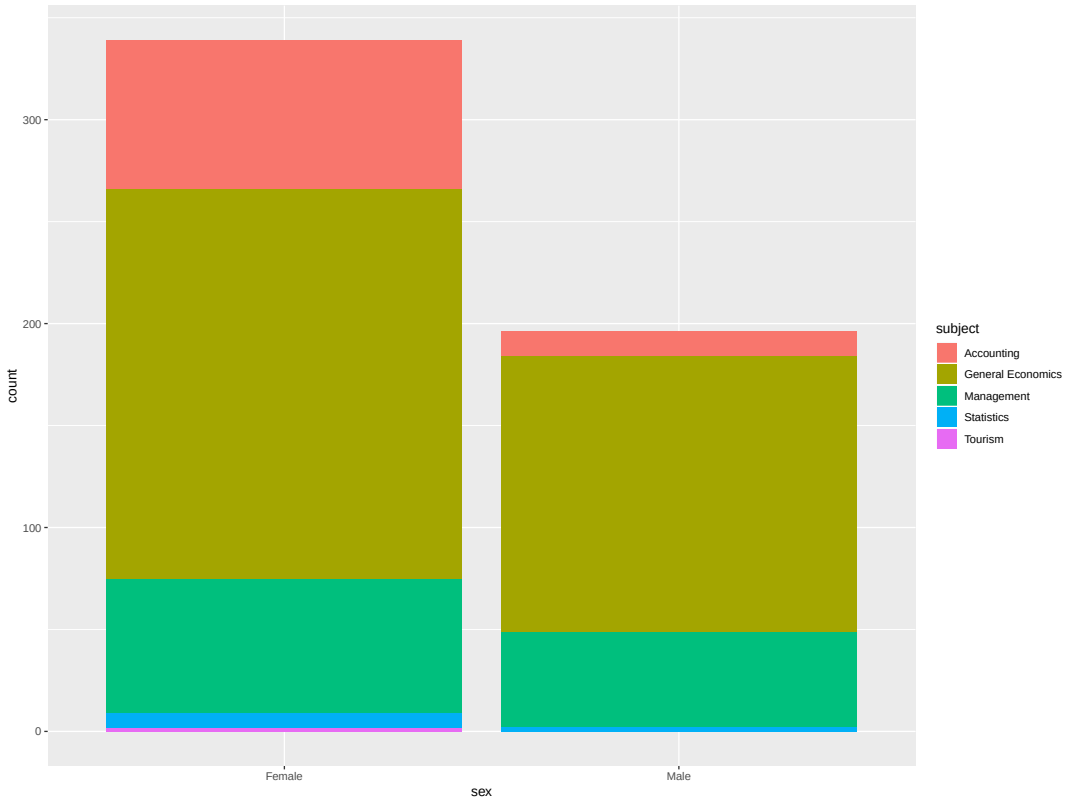
# 5 Results

*Present both your informal and formal analyses.*

# 6 Conclusion / Discussion

*You need to conclude your project, discuss the results, discuss any reservations that you have about the study and list any future work.*

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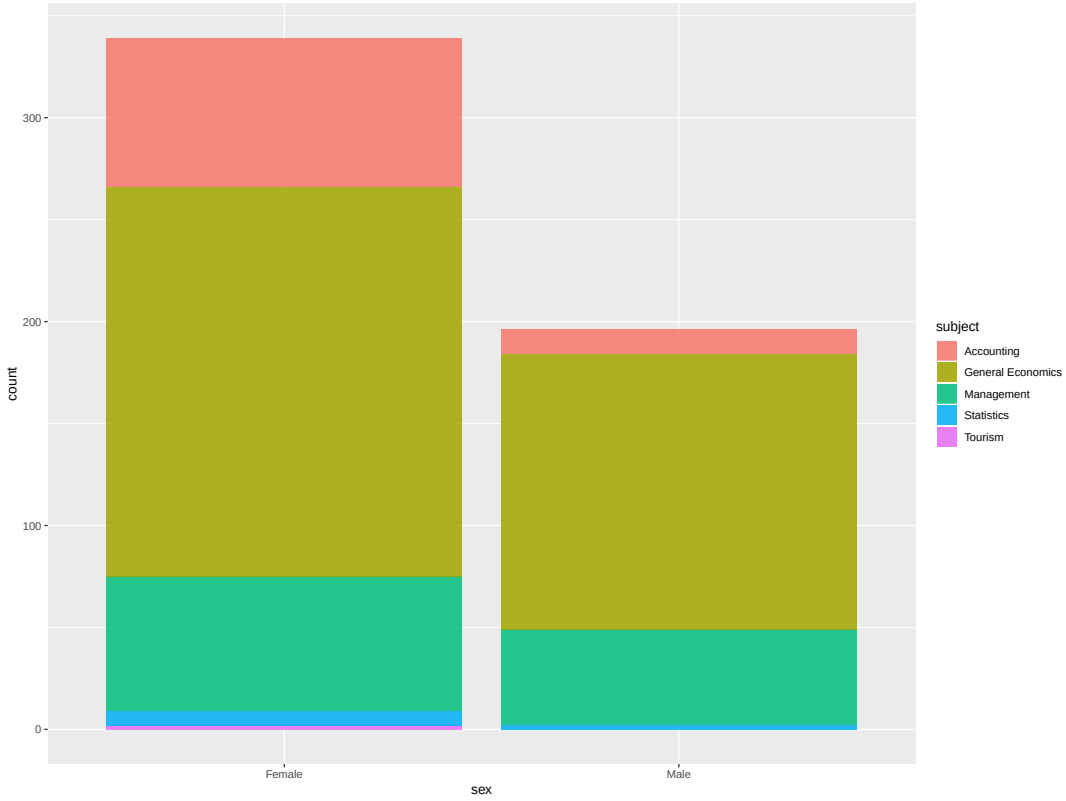
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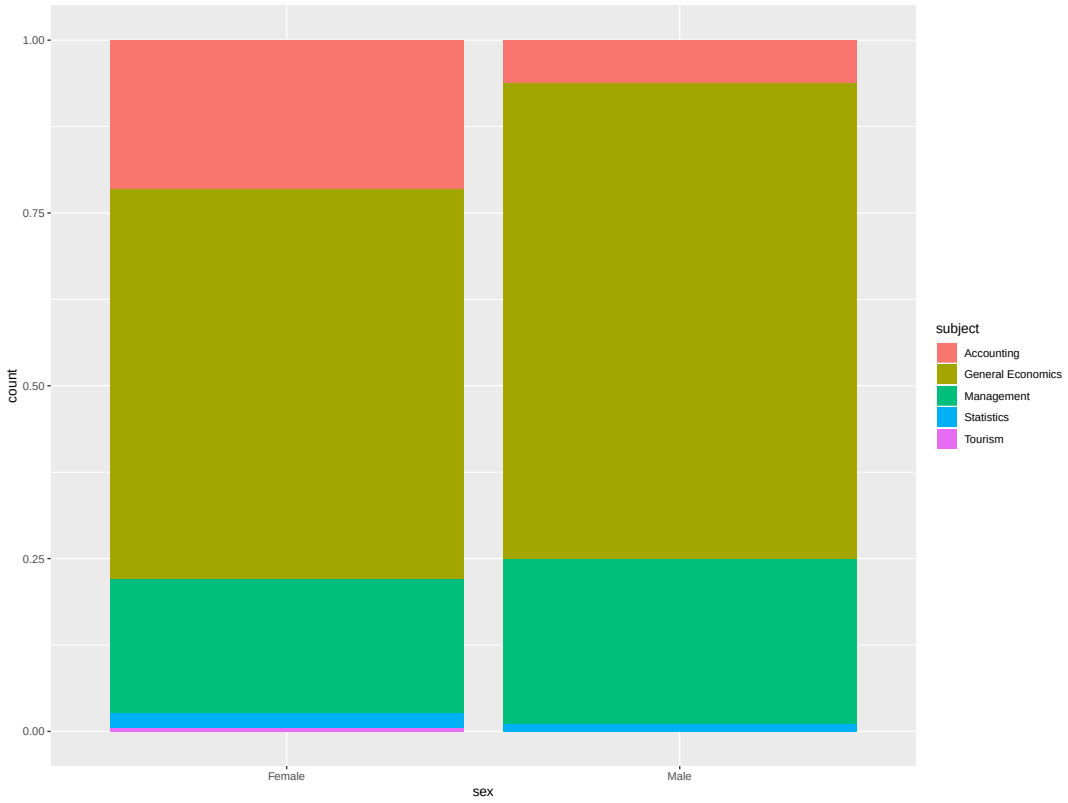
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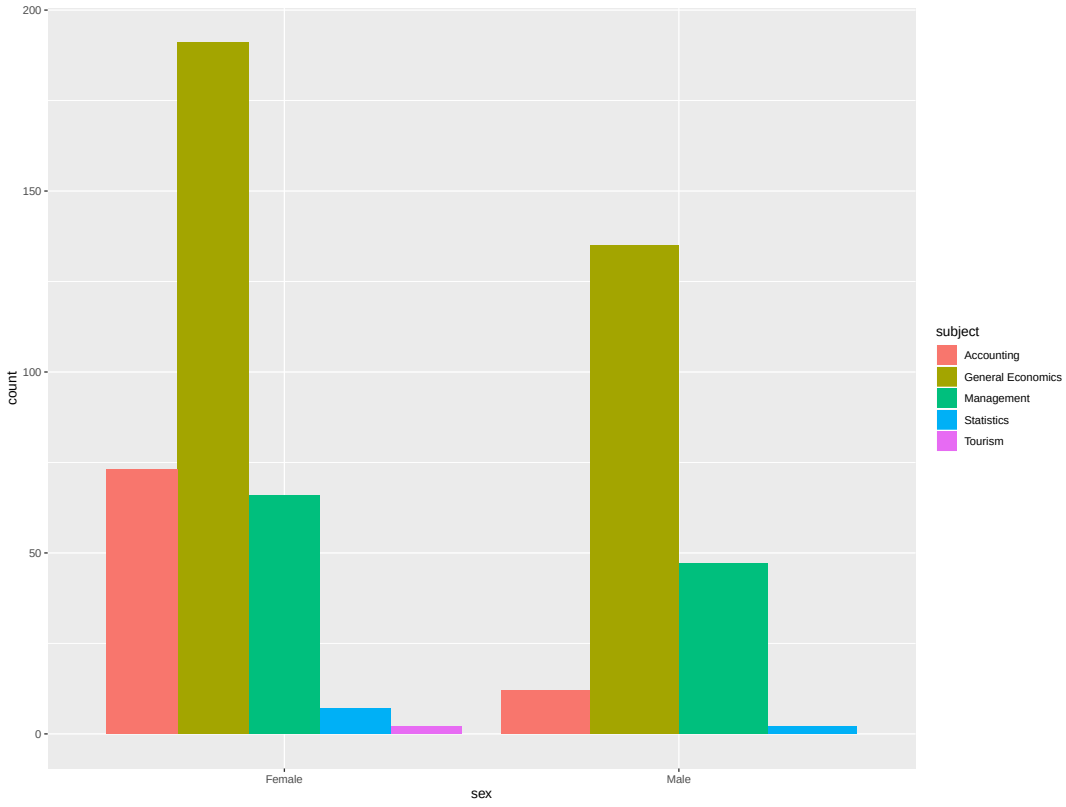
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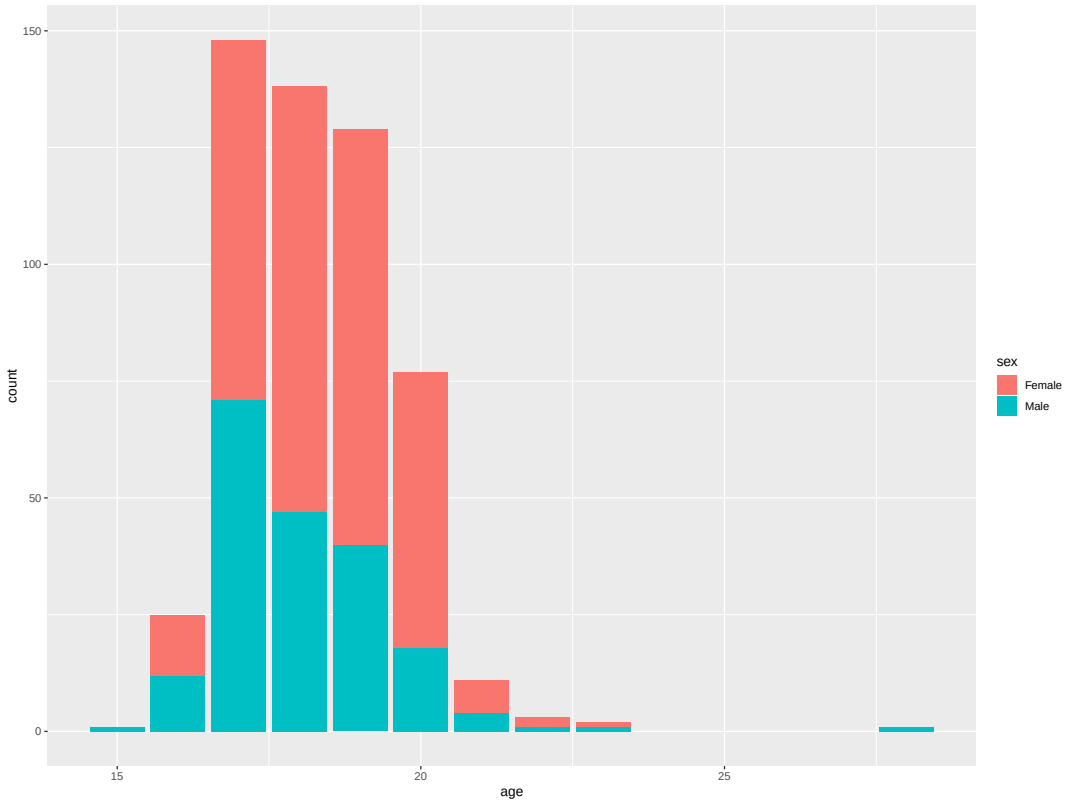
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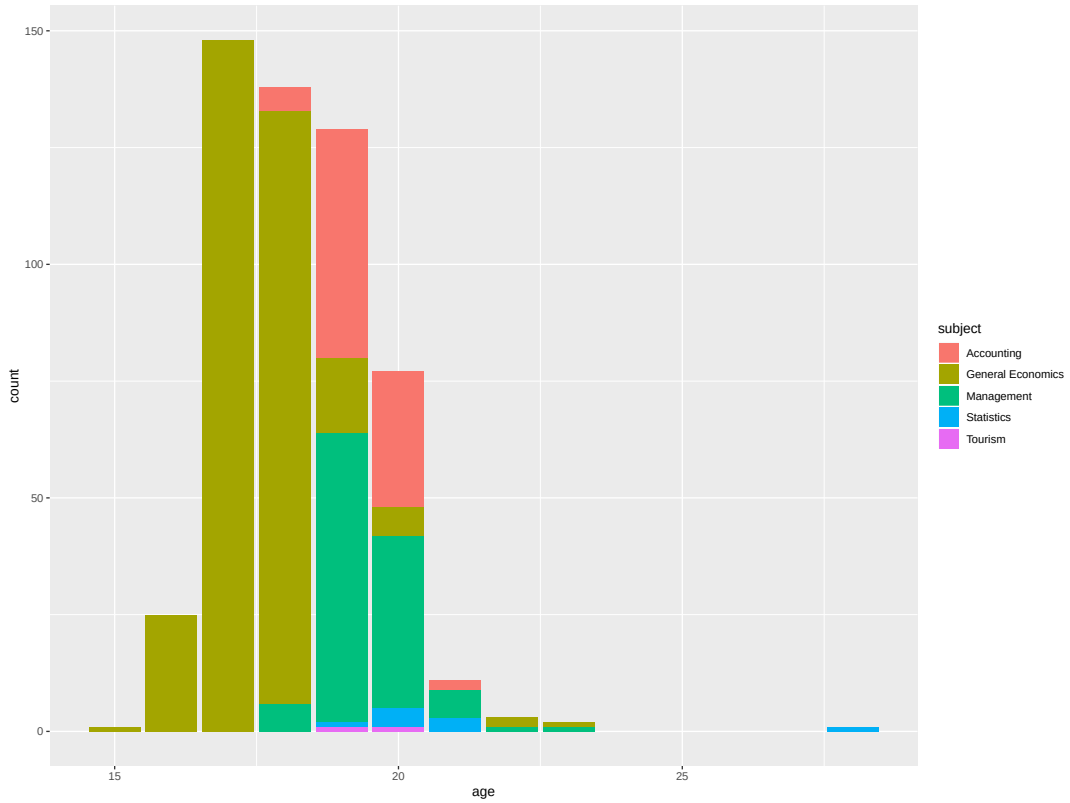
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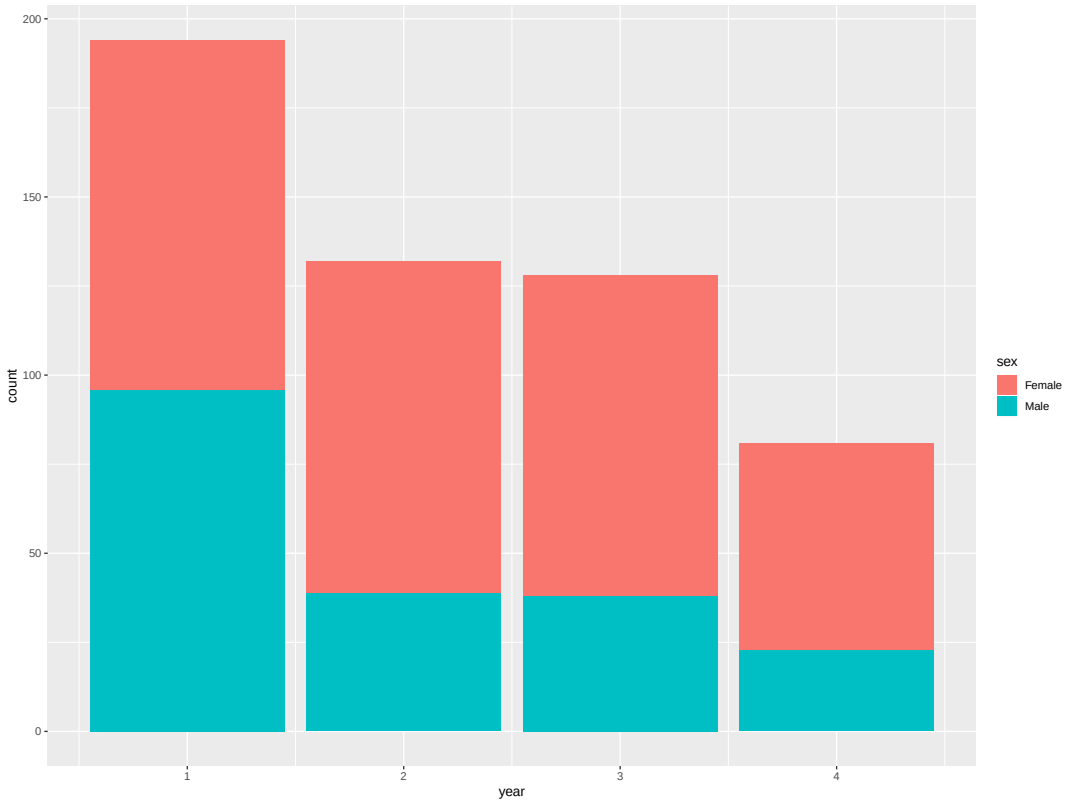
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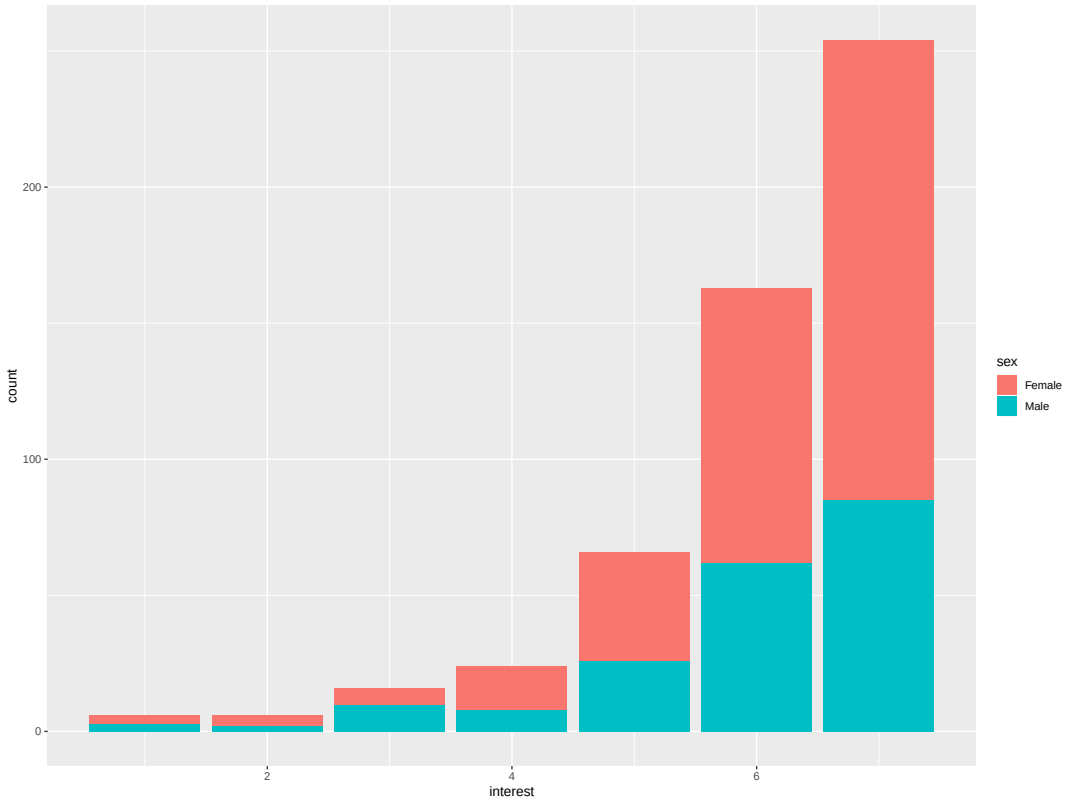
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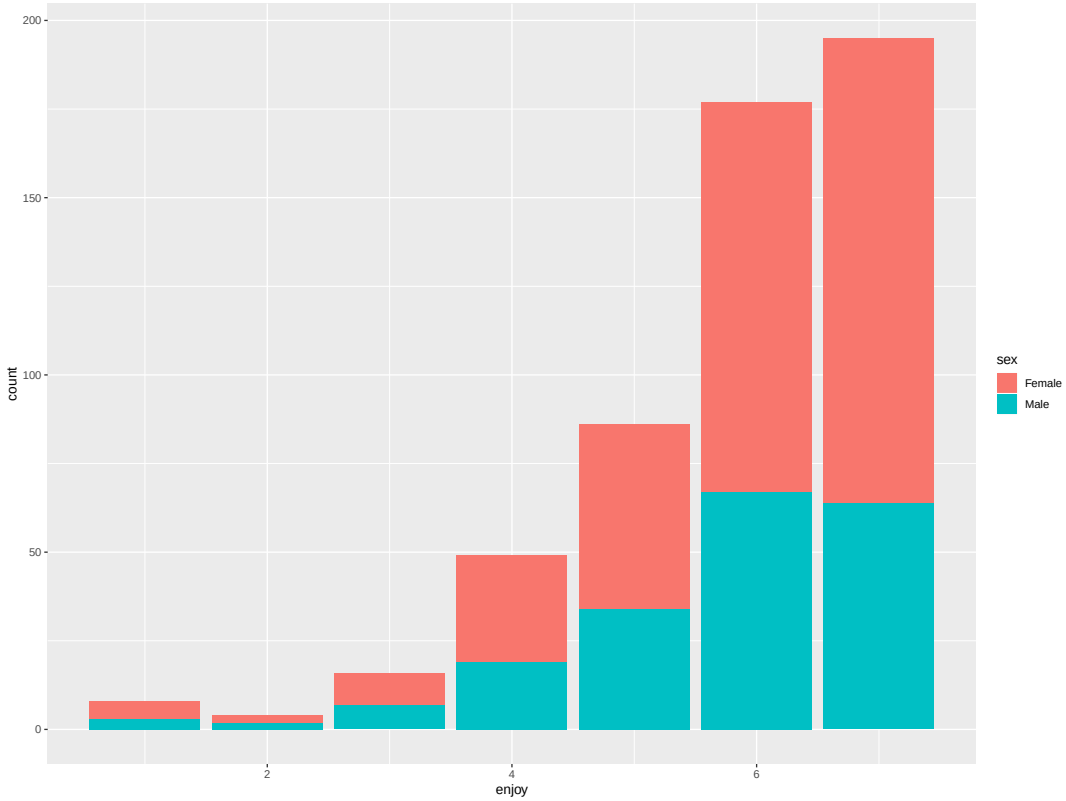
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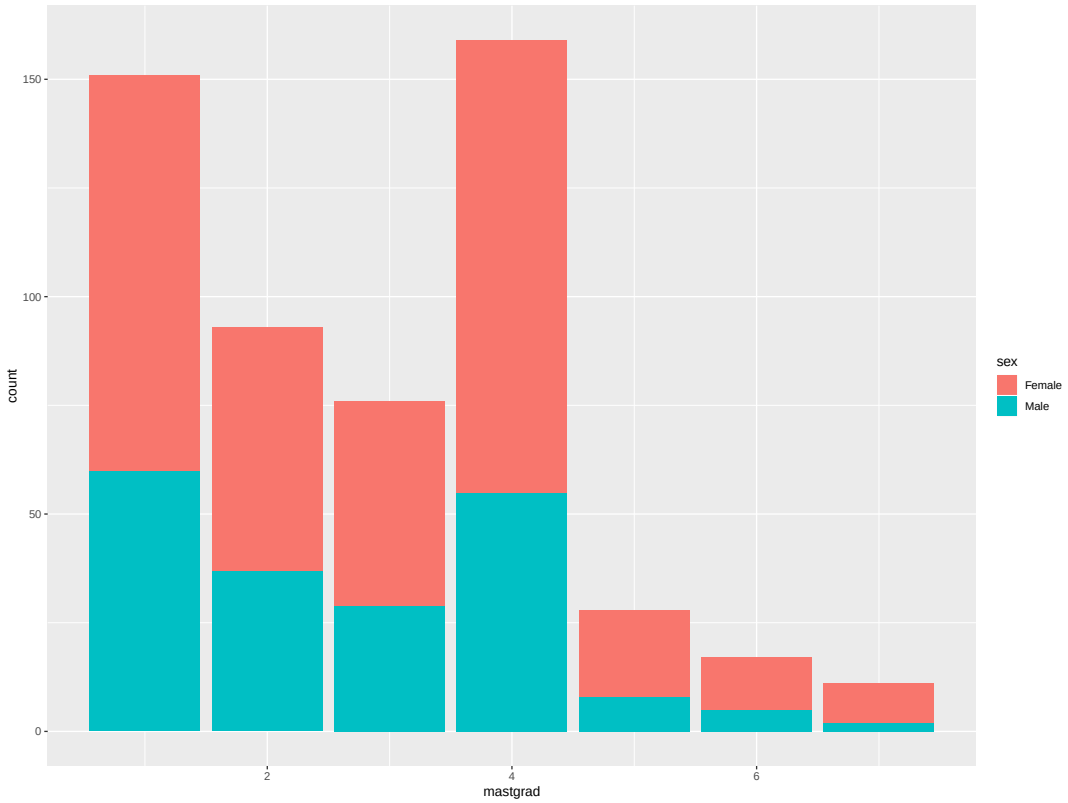
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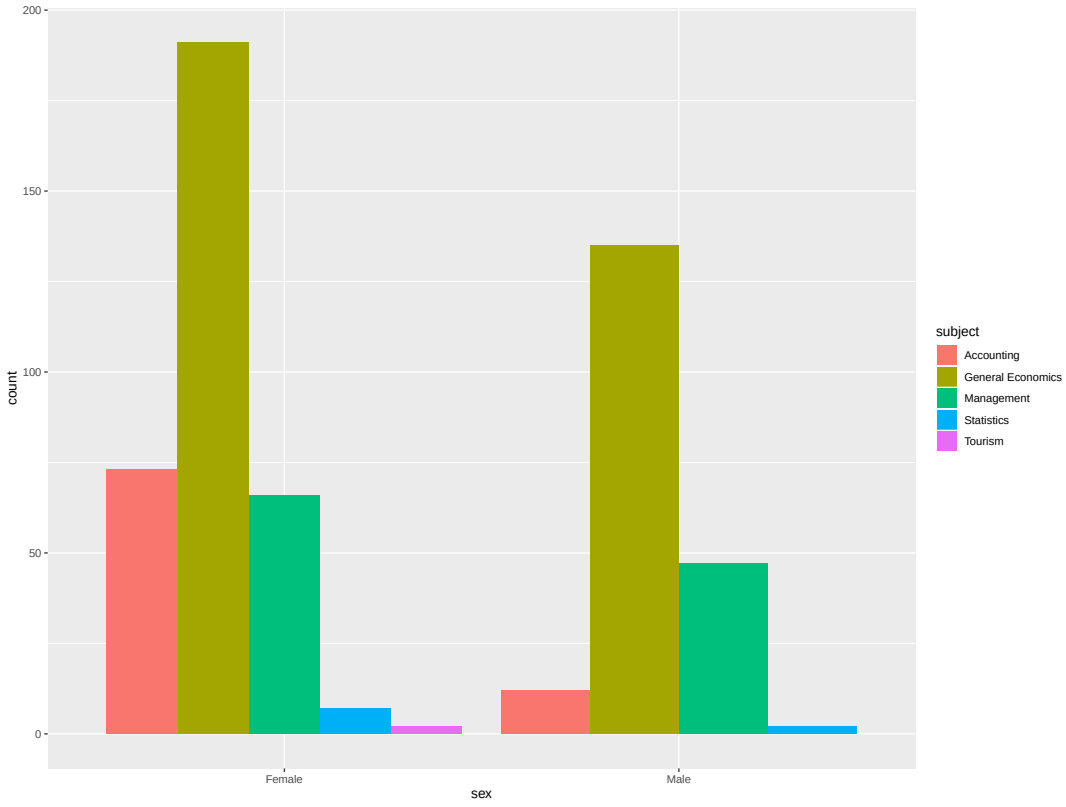
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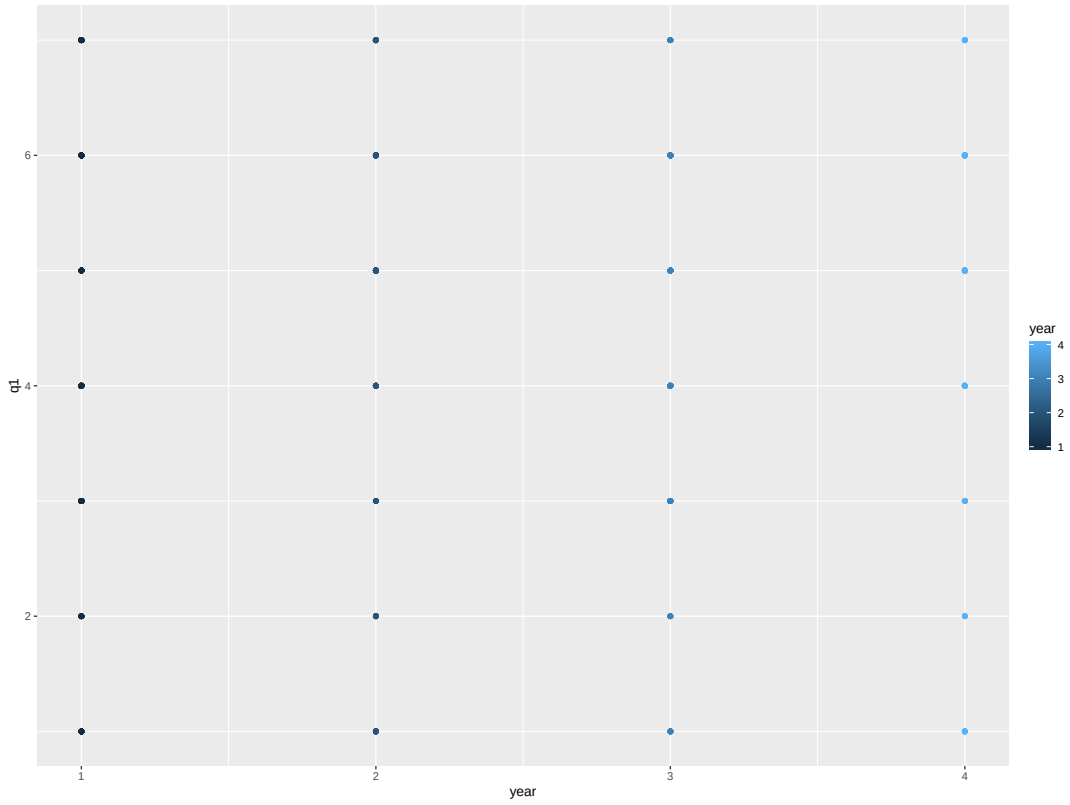
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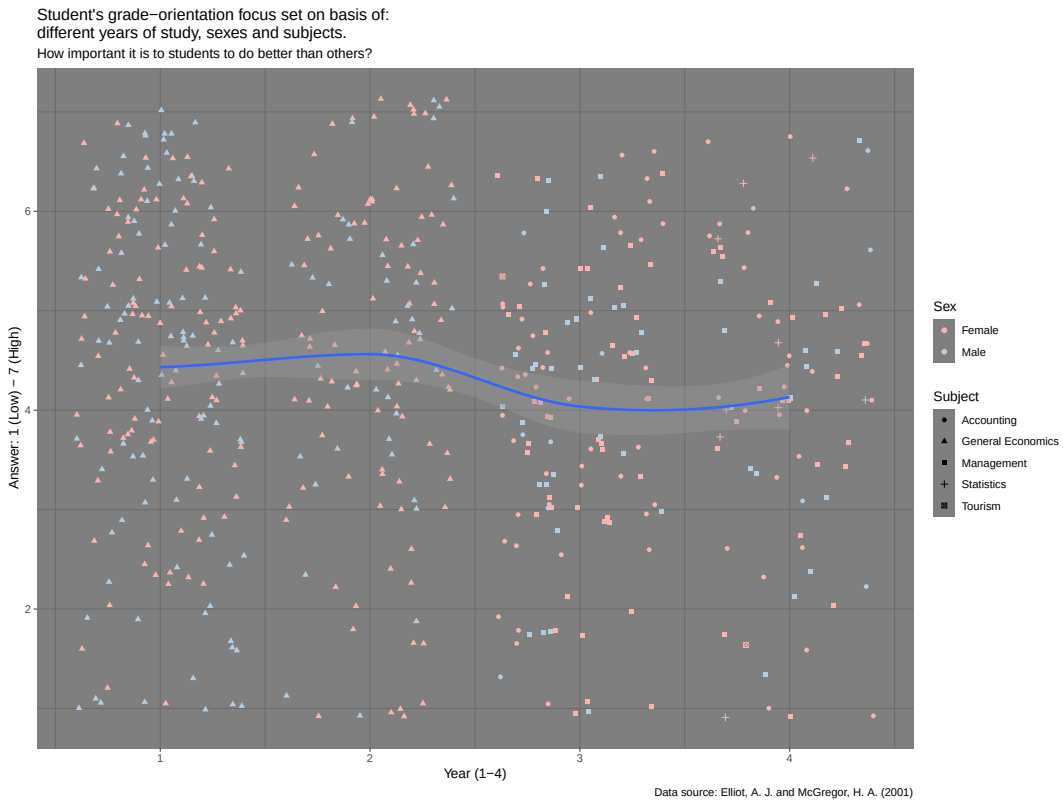
Student's grade−orientation focus set on basis of:
different years of study, sexes and subjects.
How important it is to students to do better than others?
Answer: 1 (Low) − 7 (High)
6
4
2
1
2
3
4
Year (1−4)
Data source: Elliot, A. J. and McGregor, H. A. (2001)
Sex
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Subject
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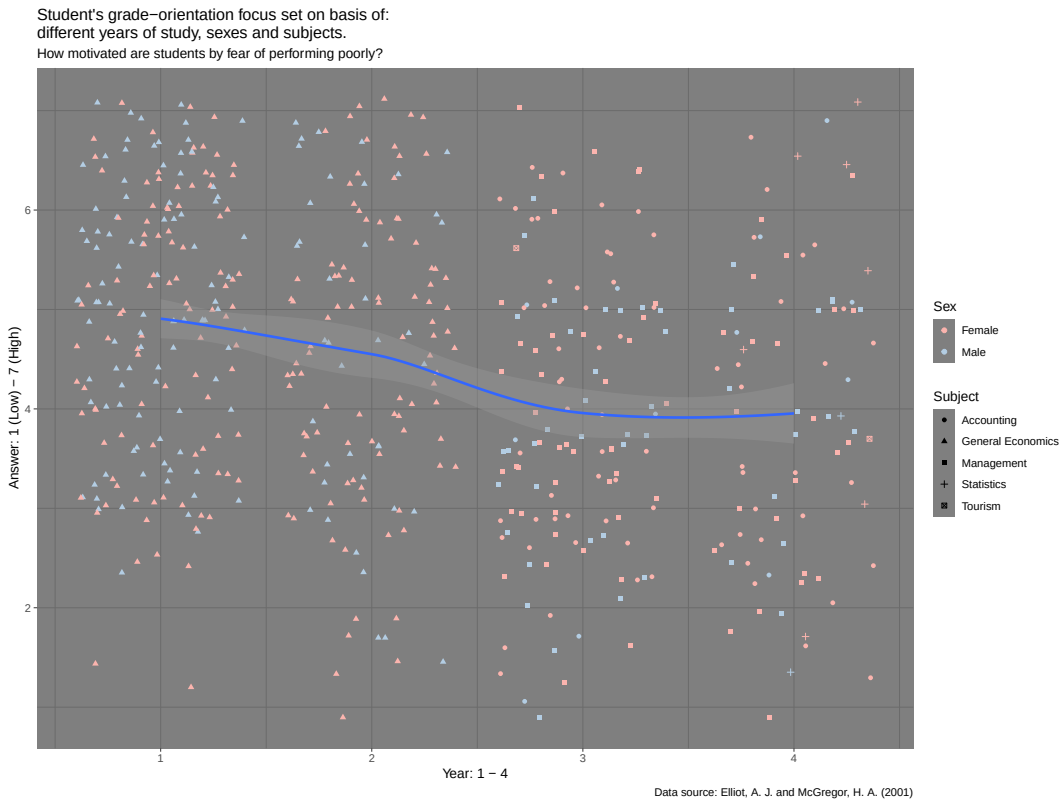
Statistics
Tourism

Figure 2: ...


Student's grade−orientation focus set on basis of:
different years of study, sexes and subjects.
How motivated are students by fear of performing poorly?
Answer: 1 (Low) − 7 (High)
6
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Year: 1 − 4
Data source: Elliot, A. J. and McGregor, H. A. (2001)
Sex
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Subject
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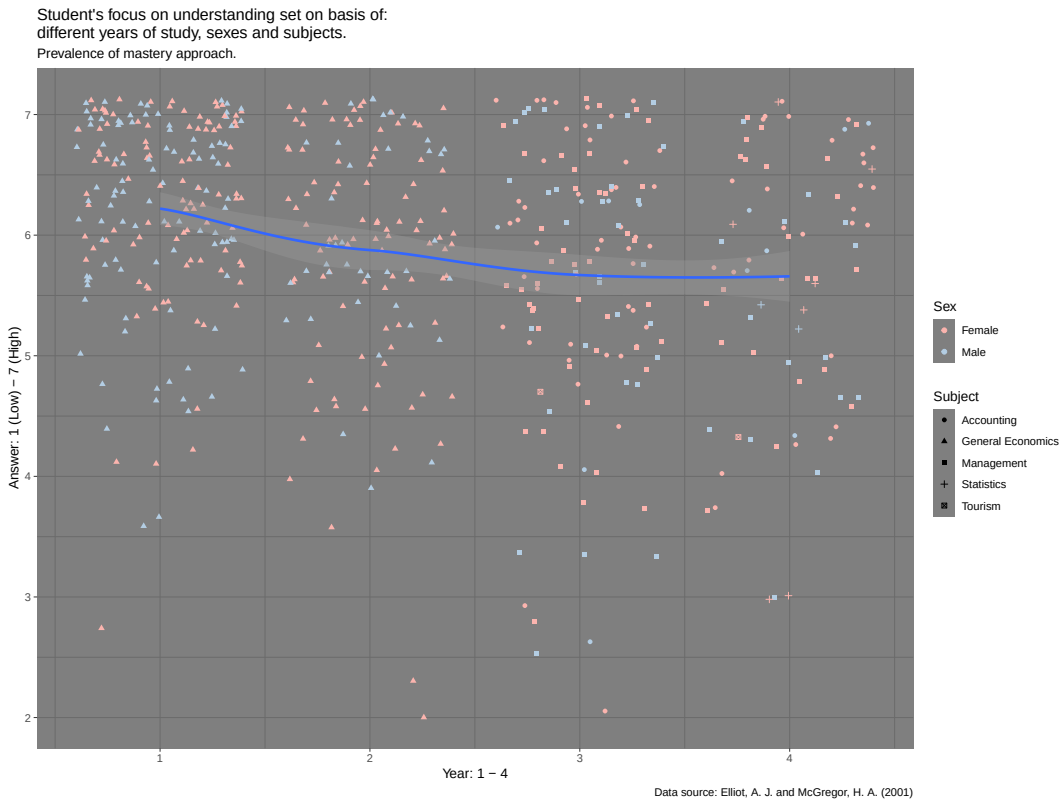
Statistics
Tourism

Figure 3: ...


Student's focus on understanding set on basis of:
different years of study, sexes and subjects.
Prevalence of mastery approach.
Answer: 1 (Low) – 7 (High)
Year: 1 – 4
Data source: Elliot, A. J. and McGregor, H. A. (2001)
Sex
Female
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Subject
Accounting
General Economics
Management
Statistics
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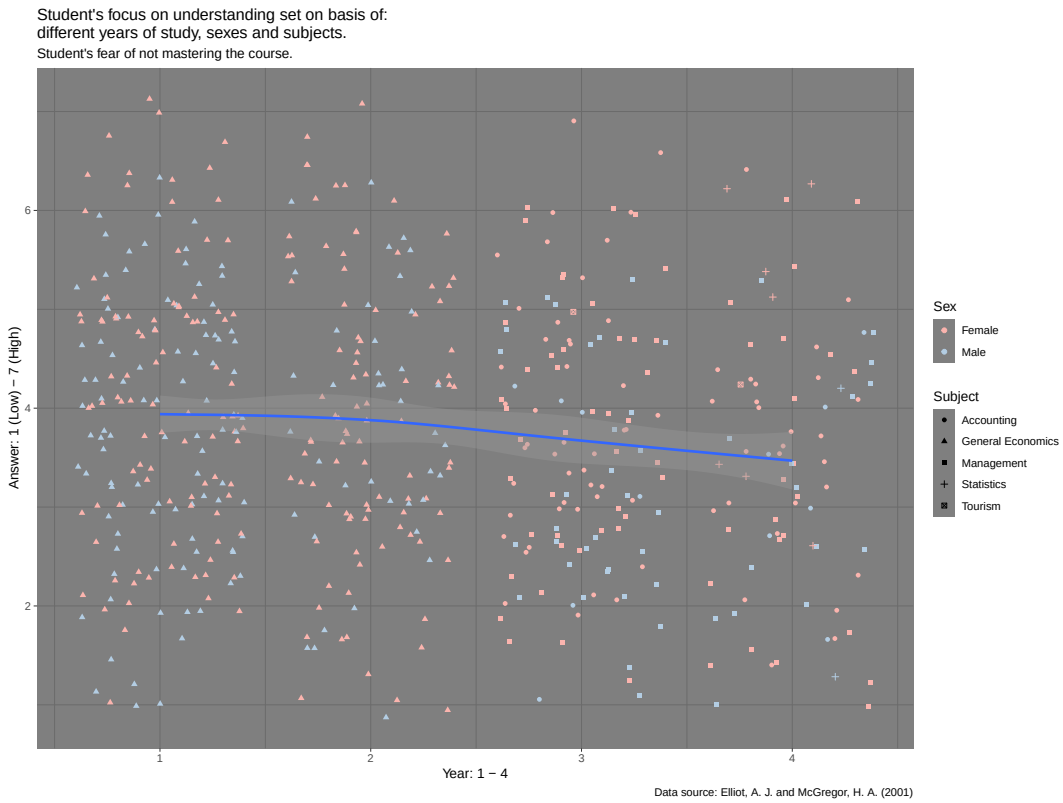
Figure 4: ...


Student's focus on understanding set on basis of:
different years of study, sexes and subjects.
Student's fear of not mastering the course.
Answer: 1 (Low) – 7 (High)
6
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Year: 1 – 4
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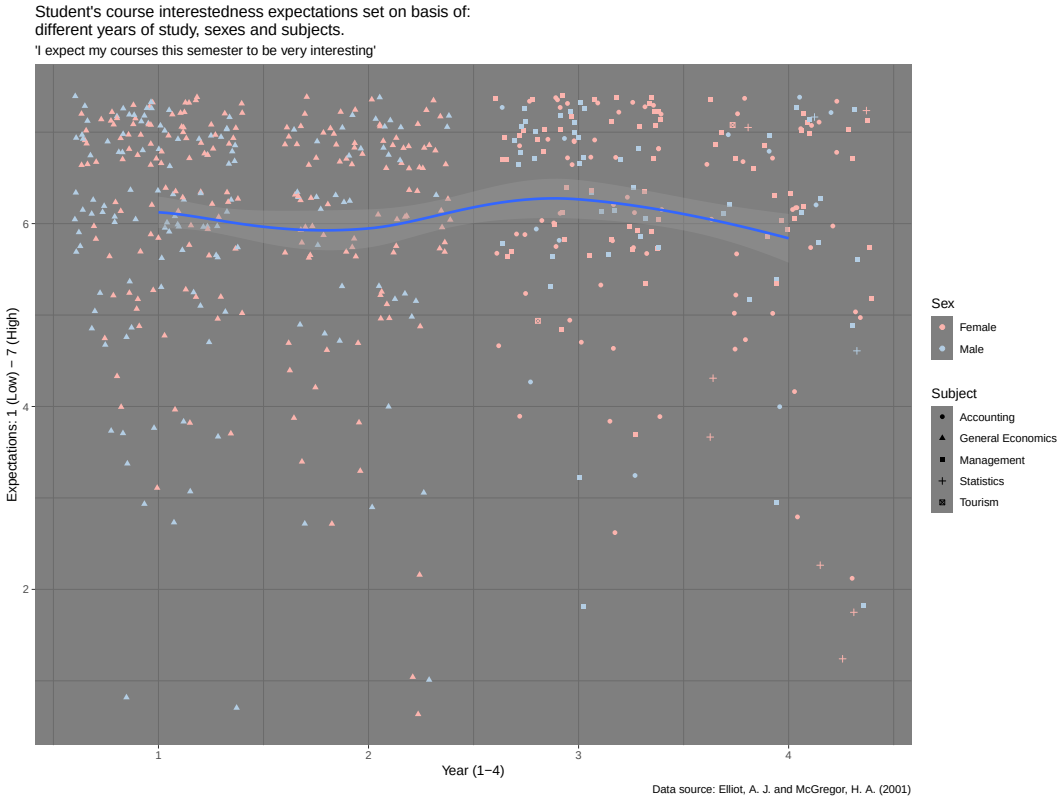
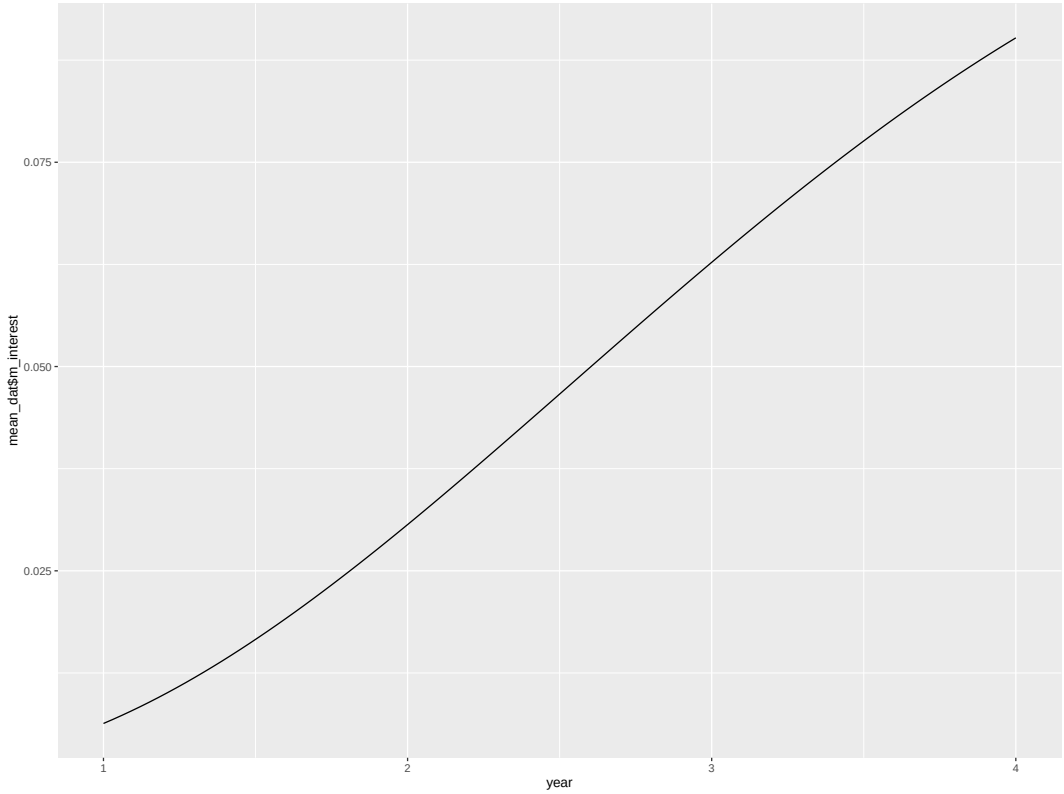
Data source: Elliot, A. J. and McGregor, H. A. (2001)

Figure 5: ...


Student's course interestedness expectations set on basis of:
different years of study, sexes and subjects.
'I expect my courses this semester to be very interesting'
Expectations: 1 (Low) – 7 (High)
6
4
2
1
2
3
4
Year (1–4)
Data source: Elliot, A. J. and McGregor, H. A. (2001)
Sex
Female
Male
Subject
Accounting
General Economics
Management
Statistics
Tourism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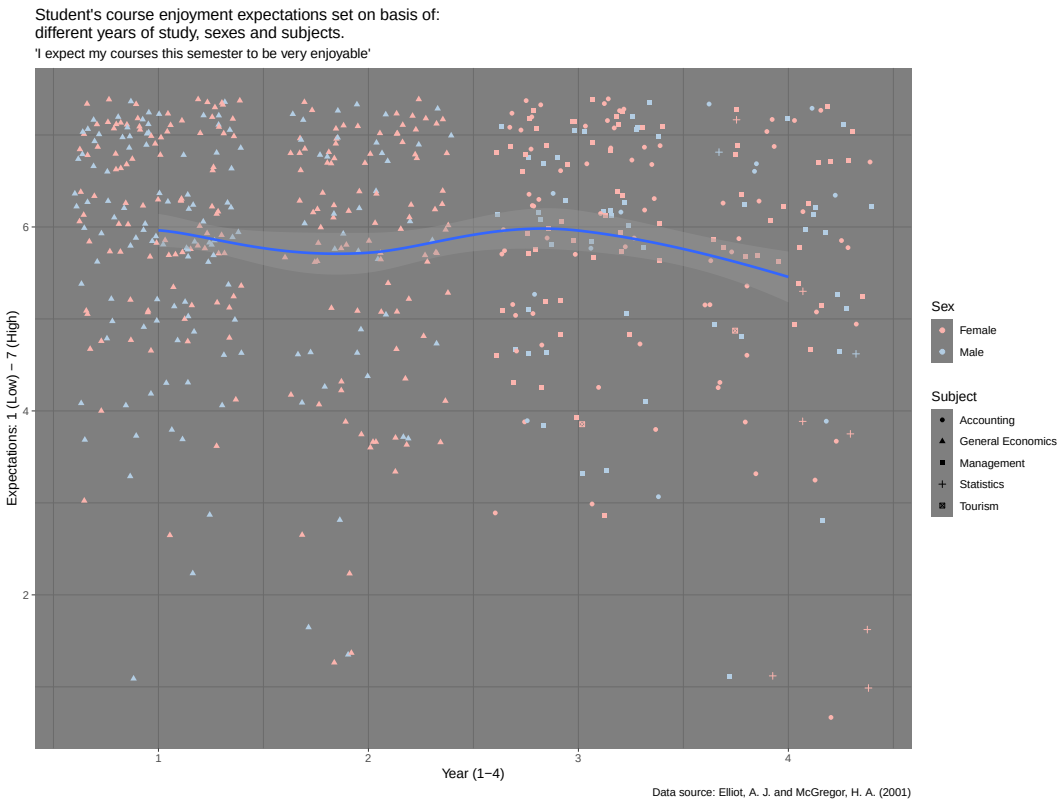
Student's course enjoyment expectations set on basis of:
different years of study, sexes and subjects.
'I expect my courses this semester to be very enjoyable'
Expectations: 1 (Low) – 7 (High)
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Year (1–4)
Data source: Elliot, A. J. and McGregor, H. A. (2001)
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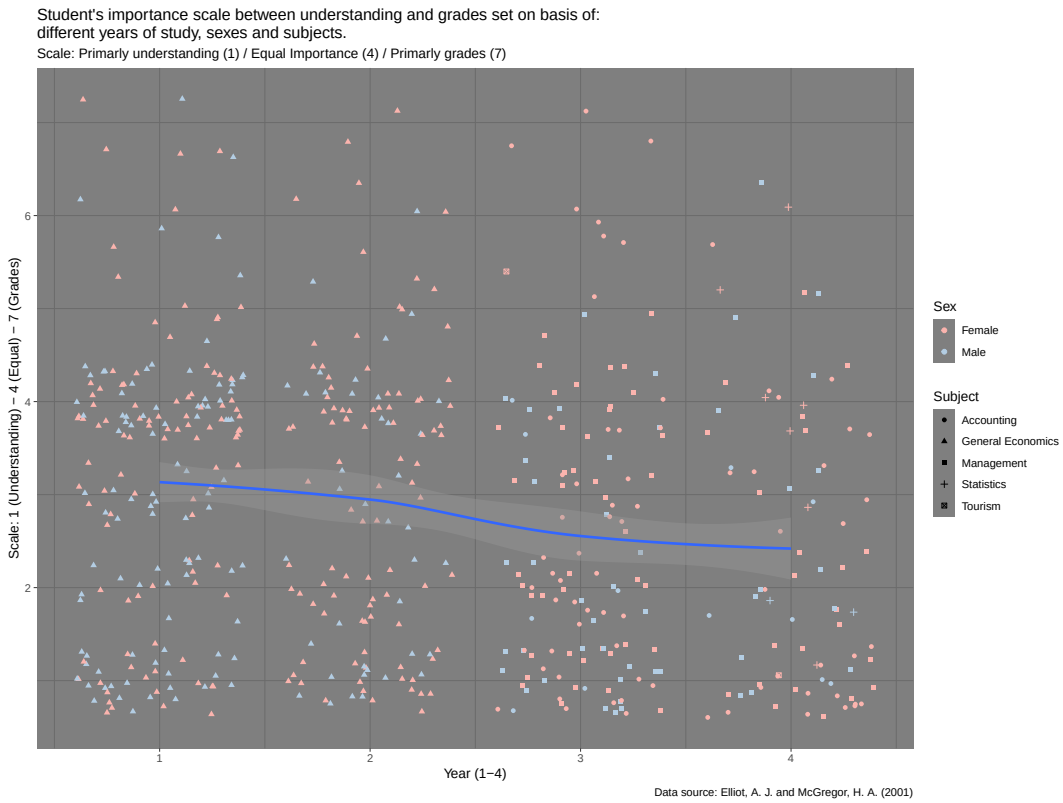
Figure 6: ...


Student's importance scale between understanding and grades set on basis of:
different years of study, sexes and subjects.
Scale: Primarly understanding (1) / Equal Importance (4) / Primarly grades (7)
Scale: 1 (Understanding) – 4 (Equal) – 7 (Grades)
6
4
2
1
2
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4
Year (1–4)
Sex
Female
Male
Subject
Accounting
General Economics
Management
Statistics
Tourism
Data source: Elliot, A. J. and McGregor, H. A. (2001)

Figure 7: ...