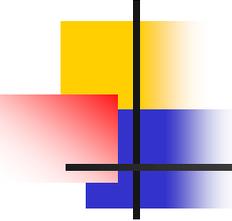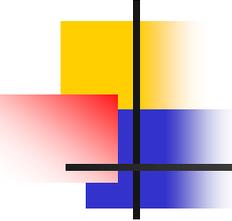# Freakatistics

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Overview

- An introduction of a semester long reading/writing project that we use in our undergraduate, general education classrooms.

- The project focuses on the best-selling book Freakonomics by Steven D. Levitt and Stephen J. Dubner

Evolution of context

- As the use of statistics has continued to grow and spread the need for consumer-oriented statistics has become increasingly more apparent (and easier to implement).

- This has been reflected in textbooks with an increasing proportion of practice problems rooted in real life context.
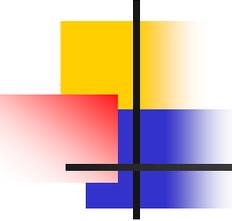
Antecdotal Observations

- While this is commendable it is not always clear that the context doesn't translate into confusion.

- It's also not always clear that students appreciate the extra context.
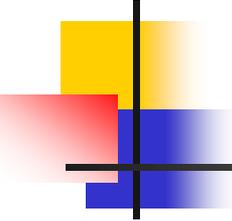
Example

- "Astronomers call a shift in the spectrum of galaxies a "redshift". A correlation between redshift level and apparent magnitude (i.e. brightness on a logarithmic scale) of a quasi-stellar object was discovered and reported by....

- Simple linear regression was applied to a sample of over 6,000 quasi-stellar objects with confirmed redshifts. The results indicated yhat = 18.13 + 6.21x where y = magnitude and x = redshift level."
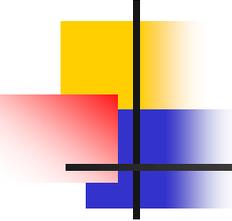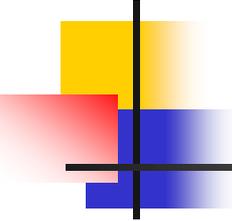
Enter Assignment

- We designed our assignment as a supplemental exercise to help underscore the importance and usefulness of statistical methodologies.
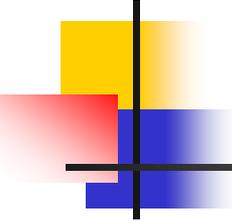
Freakonomics

- Published in 2005
- Has multiple "sequels" including Super Freakonomics
- Has been made into a movie
- Has also given rise to a blog and podcast.

Freakonomics

- Its subtitle is "A Rogue Economist Explores the Hidden Side of Everything" however given the methodologies of the book's explorations the word "economist" could easily be replaced by "statistician".

- It highlights the importance of statistical reasoning through a number of interesting, well-written examples.

In their own words
Freakonomics showcases

- Incentives are the cornerstone of modern life

- Knowing what to measure and how to measure it can make a complicated world less so

- The conventional wisdom is often wrong

- Correlation does not equal causality
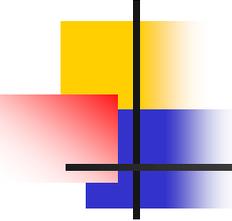
Examples

Their examples include using statistics to:

- Relate the 1973 Roe v. Wade decision to a dramatic reduction of crime in the early 90s
- Catch cheating sumo wrestlers and teachers
- Compare the dangers of flying versus driving
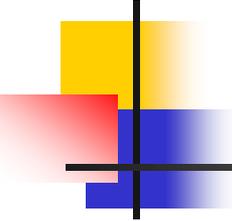
Assignment

- To preserve class time the assignment has always been done virtually.

- Since there are six chapters in Freakonomics we break students into groups of size six and create for each group a private discussion forum on Blackboard/D2L.
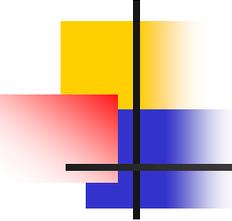
Assignment Continued

- Students begin by introducing themselves and self-assigning themselves a chapter

- (Each of the six students get assigned to one of the six chapters)
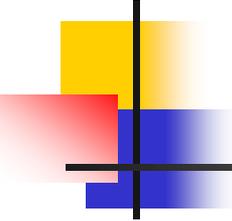
Still Continued

- For each chapter we have written a number of questions intended to provoke discussion and debate.

- Based on a predetermined schedule the student in charge of the chapter posts their answers for the discussion questions. Each other group member is then required to respond in a "thoughtful and meaningful" way.
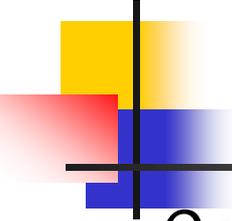
Examples of questions

- Consider the study of sumo wrestling presented in the book. What is the experimental unit of interest? What is the variable of interest?

- What is the reported median age for all users of online dating sites? Why do you think the authors reported the median rather than the mean?

- What is another claim from the news, internet or advertising that seems unlikely to you? Describe how you could set up a study to test this claim.
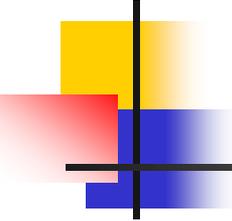
Student reaction

- Students have generally reacted positively to the assignment. It is extremely rare that they forget to participate in the discussions and, when they do, it is generally evident that they have read the book.

- Student evaluations indicated that many students found it to be one of the more enjoyable parts of the class.
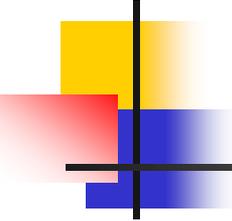
Some sample quotations

- "The first chapter of Freakonomics was very interesting"
- "I definitely learned some new ways of thinking in this chapter"
- "This chapter was the most intriguing of all three chapters we have read so far"
- "This chapter was pretty eye-opening… if only some legislators would read Freakonomics!"
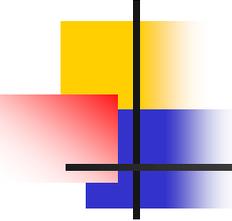
Improvements

- Better questions.

- Finding methods to increase dialogue. Most discussions ended up being "One and done".
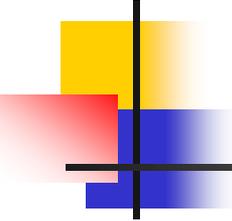
Alternatives?

There are plenty of great books addressing statistical methodologies written to appeal to a wide audience:

- *Freakonomics* "sequels"
- *Moneyball* by Michael Lewis
- *Fooled by Randomness* by Nassim Taleb
- *The Signal and the Noise* by Nate Silver
- Others?
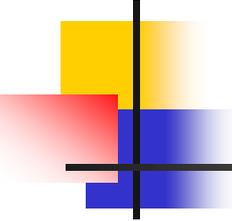
Thank you!

- For any questions or suggestions of your own don't hesitate to email:

- smcclintoc@wcupa.edu

- Thanks for your time!
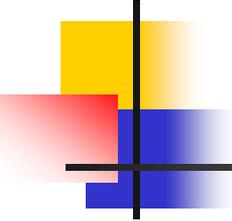
P.S.

- West Chester University expects to hire a new tenure-track statistics professor early this Fall. If you are interested in more details please don't hesitate to email me.