SPELMAN COLLEGE
Fall 2017
Economics/Management 395 (CRN 94265 / 94266), Behavioral Game Theory, Cosby 326
Monday and Wednesday, 4:30 PM to 5:45 PM
Professor: Dr. Angelino C. G. Viceisza

OFFICE HOURS AND CONTACT INFORMATION

Office Hours: Monday, 11:30 AM to 2:30 PM; Wednesday, 1:30 PM to 2:30 PM; by appointment
Office Location: Department of Economics, Giles Hall, Room 402 (4th floor)
Office Phone: 404-270-6055 (please use email; more below)
Course website: Please check Moodle. *In absence thereof, I will make use of email and/or twitter.*
Personal research website: https://sites.google.com/site/viceisza/
Default email: aviceisz@spelman.edu; Back-up email only: viceisza@gmail.com
Twitter: @aviceisza #viceisza (follow me for last-minute updates, research opportunities, scholarships, etc.)
Note: I am usually accessible via email to respond to simple questions or quick consultations. If an issue warrants discussion in person, I will refer you to my office hours. This will usually be the case for issues related to course performance. If using email, please include ECON/MGT 395 in the subject line.

REQUIRED TEXTS

1) Avinash Dixit, Susan Skeath, and David Reiley. 2014. **Games of Strategy.** 4th edition. ISBN # 978-0-393-12444-6.
2) Angelino C. G. Viceisza. 2012. **Treating the Field as a Lab: A Basic Guide to Conducting Economics Experiments for Policymaking.** 1st edition. ISBN # 978-0-89629-796-8 (freely downloadable at this link; please complete short download form for future updates).
3) Additional readings such as journal articles (see course outline).

COURSE DESCRIPTION

ECON/MGT 395 draws on game theory and behavioral and experimental economics. Game theory is a way of thinking about situations in which decisionmakers interact. Behavioral economics incorporates psychological principles into standard and game theoretic economic models. Experimental economics is the use of experimental methods to collect data to test standard, game-theoretic and behavioral models. ECON/MGT 395 pulls from these subfields in order to develop quantitative research skills and give the student a feel for graduate work in economics. The primary approach is based on discussion, construction, and testing of standard, game-theoretic, and behavioral models, supported by means of empirical (primarily experimental) applications and examples.

PREREQUISITES

ECON 242 Principles of Microeconomics, with a minimum grade of C, or approval from the Professor is *required* to take this course. The student must withdraw from this course if the student has not completed this prerequisite or has not received approval from the Professor. Failure to withdraw from the course may result in the student being administratively withdrawn from or denied access to the course. ECON 315 Intermediate Microeconomic Theory (in lieu of ECON 242), ECON 303 Econometrics and ECON 304 Mathematical Economics, all with a minimum grade of C, are *preferred (but not required)* to take this course.

BEHAVIORAL OBJECTIVES

Upon completion of this course, the student should be able to:

Quantitative basics

1. Apply tools from multivariate calculus and statistics to game-theoretic concepts.
2. Partially differentiate explicit and implicit functions.
3. Recognize why and when such methods are required.

Game theory

4. Describe game theory (GT), its components, and its applications.
5. Distinguish between simultaneous (strategic) and sequential move games.
6. Define risk, uncertainty and expected utility, and apply these to situations of strategic uncertainty.
7. Distinguish between games of complete and incomplete information as well as symmetric and asymmetric information.
8. Apply the appropriate concepts to solve games of type (5), type (7), and combined games.
9. Recognize and describe applications and examples of these types of games.
10. Relate parlor (day-to-day) games to theoretical games.
11. Apply the tools of game theory to describe and analyze situations of strategic interaction. Specifically, derive testable hypotheses from such games.

Behavioral

12. Describe behavioral economics and its assumptions, and how it relates to/is different from standard game theory and neoclassical economics.
13. Discuss and apply behavioral economics concepts. For example:
    a. Departures from standard rationality.
    b. Nonstandard (in particular, non-Bayesian) information processing/updating of beliefs.
    c. Non-expected utility formation such as prospect theory (loss aversion, status quo).
    d. Nonstandard preferences (social, reference-dependent etc.)
    e. Temptation and self-control.
    f. Framing, mental accounting, and endowment effects.

Experimental

14. Describe experimental economics and how it relates to/is different from behavioral economics and GT.
15. Discuss experimental applications of game theoretic, behavioral, and neoclassical models.
16. Discuss components of an experiment and sketch an experimental design.
17. Describe the strengths and weaknesses of experimentation.
18. Discuss internal and external validity and relate this to the former point.

JUSTIFICATION FOR FOUR CREDITS

This is a four credit, three contact-hour course. To justify the additional credit, the student will be required to read assigned book chapters and several articles outside of class. In particular, the student will prepare at least one article and a referee report beforehand, and present/lead the discussion of the article during class.

COURSE GRADING

The course grade will be determined by:

Exam 1	15%
Exam 2	15%
Comprehensive final exam	25%
Research proposal and presentation	20%
Article presentation and referee report	15% (10% for presentation and 5% for report)
Attendance and participation	10% (7.5% for attendance; 2.5% for participation)

The following grading scale will be employed:

Percentage Earned	Grade Earned	Percentage Earned	Grade Earned
93 – 100	A	70 – 74	C
90 – 92	A-	65 – 69	C-
87 – 89	B+	62 – 64	D+
83 – 86	B	58 – 61	D
79 – 82	B-	below 57	F
75 – 78	C+		

Note: (1) The above scale should be regarded as approximate as the instructor reserves the right to make adjustments in awarding final grades. (2) I typically grade exams with a "bump".

RESEARCH PROPOSAL (RP) AND PRESENTATION

The research proposal should be based on a carefully developed research question that if properly executed in the medium run can lead to an independent study or senior thesis and in the long run can lead to a peer-reviewed journal article. Additional details on the research proposal will be provided in due course; however, the proposal should comprise at least the following components:

1) An introduction covering:
    a. The main research question
    b. A review of the literature and the contribution of the particular research question
    c. The organization of the proposal
2) A conceptual framework covering:
    a. The (game-theoretic, behavioral, or neoclassical) model setup
    b. The testable hypotheses derived from this model
    c. The empirical strategy associated with this model
3) A study design covering:
    a. An empirical strategy based on an experimental design (treatments etc.)
    b. An experiment protocol (implementation) based on 2b and 2c
    c. A design for additional data collection for example by means of a survey
    d. The targeted sample, sample size (power), randomization strategy
    e. An explicit discussion of internal and external validity
    f. Execution budget
4) A conclusion and next steps covering:
    a. The (policy) contributions of the research once carried out.
    b. Since the student is **NOT** necessarily expected to collect data and test the hypotheses in 2b using the strategy proposed in 2c as part of the course, this section of the proposal should discuss how the student foresees moving the research project forward in the future.

The RP will pass two stages of review (Stage 1 and 2) prior to being submitted for final grading/Stage 3 (see course outline for due dates). Stages 1, 2 and 3 count for 2.5%, 7.5%, and 10% of your grade respectively. Towards the end of the semester, students will also present their RPs during a short 5-10-minute "pitch". During this time, the student should discuss (1) the main research question, (2) its contribution, and (3) the proposed design of the study. The rubric at the end of the document discusses some further guidelines for the proposal.

ARTICLE PRESENTATION AND REFEREE REPORT

The student will be responsible for presenting at least one article from the reading list (see course outline) in class. The student should plan on presenting for approximately 35 to 40 minutes and the presentation should focus on the article's (1) main question, (2) theoretical and empirical methodology, (3) main findings, (4) relation to class

content, (5) assessment of the article (critique, strengths, weaknesses, suggestions for improvement) and (6) issues for class discussion (such as two questions posed to the class for further discussion). The student will also prepare a referee report of the article. The referee report should be between two to three pages and should represent a concise summary of the aforementioned items.

FORMATTING

All written documentation (in particular, the different stages of the research proposal and the referee report) should be in Times New Roman 11 point font with 1.5 spacing and 1 inch margins all around. **ANY FILES THAT ARE UPLOADED TO MOODLE SHOULD BE LESS THAN 2 MB.**

MAKE-UP POLICIES AND EXTRA CREDIT

1. **EXAMS:** The exams **CANNOT** be made up, whether the absence is excused or not. In case an absence is excused by the Office of the Dean within a week of the missed exam date, I reserve the right to place the weight of the missed exam on the remaining exams.
2. **FINAL EXAM:** The final exam absolutely **CANNOT** be made up. If a student misses the final exam, the student will receive a zero (0) for the exam. An exception **may** be made if a student seeks approval from me **PRIOR** to the exam by providing a valid documented excuse approved by the Office of the Dean. Even in this case, I still reserve the right to deny the student's request.
3. **RESEARCH PROPOSAL AND PRESENTATION:** The research proposal and/or presentation **CANNOT** be made up, whether the absence is excused or not. If a student misses the proposal, the student will receive a zero (0).
4. **ARTICLE PRESENTATION AND REFEREE REPORT:** These assignments **CANNOT** be made up. If the student misses either one, the student will receive a zero (0).
5. **TARDINESS:** Late submissions will **NOT** be accepted. They will receive a zero (0).
6. **EXTRA CREDIT:** It is my experience that most students fail to submit all possible assignments. As such, it does not make economic sense to give opportunities for extra credit since students are not making use of the opportunities already afforded to them. So, I will **NOT** give extra credit, regardless of the student's circumstances.
   ALL ASSIGNMENTS ARE DUE 11:59 PM OF THE DATE STATED ON THE SYLLABUS. REFEREE REPORTS ARE DUE THE DAY OF THE PRESENTATION.
   THERE ARE NO EXCEPTIONS TO ANY OF THESE RULES.

ACCESS TO EXAMS

Exams in this course are not permitted to enter "the public domain". Although there is no obligation to allow the student to review exams after they have been reviewed in class and collected, if a student wishes to review an exam, I will typically accommodate the student during office hours.

ATTENDANCE AND PARTICIPATION

Class attendance and participation are mandatory, as these are integral parts of the class. *As such, 10% of your class grade comes from these components.* Please note the following:

1. Attendance is taken at the beginning of each class.
2. For students who have the habit of arriving after the class begins (late arrival), I reserve the right to count late arrivals as absences. The student is considered late if the student is not present when class begins. I typically count tardiness as an absence if the student arrives after I finished taking attendance. In case of excessive lateness (ten minutes after class begins), I reserve the right to bar a student from entering the classroom.

3. If a student misses zero (0, no) classes, the student receives 100 for the attendance portion of the grade. If a student misses one (1) class (*excused or unexcused*), the student receives 95 for attendance. If a student misses two (2) classes (*excused or unexcused*), the student receives 90 for attendance. Any student with three (3) or more absences (*excused or unexcused*) will receive a zero (0) for attendance. *This means that this student loses 7.5% of the course grade.*
4. **Any student with five (5) or more absences (*excused or unexcused*) will be administratively withdrawn from the course. I will email the student a notification and proceed by processing such withdrawal through the Office of Undergraduate Studies.**
5. Class participation will be judged based on thoughtful questions and discussions **and** lack of disruptive behavior during class (see General Code of Conduct section of this syllabus). In particular, if a student uses a cell phone during class (without my permission), the student will receive a zero (0) for the participation portion of the grade. *This means that this student loses 2.5% of the course grade.*
   THERE ARE NO EXCEPTIONS TO ANY OF THESE RULES.

ACADEMIC INTEGRITY

The following is Spelman College's **Academic Integrity Policy**:

"At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust, and mutual respect. All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to read and abide by the Spelman College Code of Conduct (see the Spelman College Student Handbook) and are expected to behave as mature and responsible members of the Spelman College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy."

Violators will be subject to the sanctions outlined in the Spelman College Bulletin.

GENERAL CODE OF CONDUCT (INCLUDING TECHNOLOGY AND CELL PHONE USE POLICY)

It is understood that any student participating in this course will show conduct in a manner that is constructive and non-disruptive to the learning environment. This is out of mutual respect for the professor as well as fellow students.

With this in mind, use of any form of technology—including computers and cell phones—is only allowed if it is absolutely necessary for the student's learning within the course. If so, the student should see me by the end of the first day of class to discuss and potentially obtain permission to use such a technology. Even if granted, I still reserve the right to revoke this privilege if I note in a future class that such technology is being used for purposes other than learning related to the course.

In the absence of such permission, use of technologies is strictly prohibited unless the professor explicitly requests the students to use such technologies. The student should turn off cell phones, laptops, tablets, or any other noise-making devices while in class as these can generally be considered disruptive. Any such disturbances will result in automatic eviction from class. NO EXCEPTIONS!!!

DISABILITY STATEMENT

The following is Spelman College's **Disability Statement**:

"Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the College's programs or services, you should contact the Office of Disability Services (ODS) as soon as possible. To receive any academic accommodation, you must be appropriately registered with ODS. The ODS works with students confidentially and does not disclose any disability-related information without their permission. ODS serves as a clearinghouse on disability issues and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, please contact the ODS at 404-270-5289 (voice), located in MacVicar Hall, Room 106."

CENTER FOR ACADEMIC PLANNING AND SUCCESS (CAPS)

The Spelman College Center for Academic Planning and Success (see http://www.spelman.edu/academics/caps) is located in the Milligan Building, 2nd floor. The Center provides peer tutors for various subject areas, including economics. The schedule of times when peer tutors will be available can be acquired from the Center. This is a valuable resource for student learning and students are urged to avail themselves of the Center. Peer tutors have previously been very successful students in the course.

GENERAL REMARKS

1. Students are expected to plan their air travel at the end of the semester so that it does not conflict with the final exam. The same applies to other types of travel throughout the semester.
2. Students should select a "buddy" in the course from whom they can obtain materials in case they miss class. It is the student's responsibility to obtain such material and stay up to speed.
3. The syllabus provides a general plan for the course; deviations may be necessary.

COURSE OUTLINE

The following course outline is a general plan of action and deviations may be necessary. In particular, additional student presentations may be scheduled depending on eventual class size.

Introduction

8/16

- Syllabus and Introduction

8/21-8/23

- An introduction to game theory (with linkages to individual choice, (expected) utility theory, behavioral and experimental)
    - Readings
        - *Games of Strategy*, Part I
        - Gibbons, R. 1997. An introduction to applicable game theory. *Journal of Economic Perspectives* 11 (4): 127-149
        - Samuelson, L. 2016. Game theory in economics and beyond. *Journal of Economic Perspectives* 30 (4): 107-130
        - Thaler, R. H. 2016. Behavioral Economics: Past, Present, and Future. *American Economic Review* 106 (7): 1577-1600

8/28-8/30

- Some "technical" concepts/foundations from mathematics and statistics

- Lecture Notes
- Online videos to be watched/processed ***PRIOR to class***
- ***If these links become inactive, search youtube for Khan Academy videos related to these topics***
  - Univariate calculus (calculus of one variable)
    - Derivatives as slope: https://www.youtube.com/watch?v=ANyVpMS3HL4
    - Quotient rule: https://www.youtube.com/watch?v=E_1gEtiGPNI
    - Also watch for power rule, product rule, and chain rule.
  - Multivariate calculus (calculus of more than one variable)
    - Part 1: https://www.youtube.com/watch?v=1CMDS4-PKKQ
    - Part 2: https://www.youtube.com/watch?v=-u0mqFqpMNY
  - Probability and statistics
    - Part 1: https://www.youtube.com/watch?v=3ER8OkqBdpE
    - There are also other parts; review 2-4 if you can.

Game theory

9/4
- NO CLASS DUE TO LABOR DAY

9/6
- Simultaneous-move games and Nash equilibrium
  - Readings
    - *Games of Strategy*, Chapters on simultaneous-move games (pure and mixed strategies)
  - Application
    - Classroom coordination game with discussion.

9/6: Stage 1 of RP is due!!!

9/11
- Simultaneous-move games and Nash equilibrium (continued)
  - First student presentation based on:
    - Camerer, F. 2003. Behavioral game theory. Section 7.1
  - Second student presentation based on:
    - Camerer, F. 2003. Behavioral game theory. Section 7.2

9/13
- Sequential-move games and subgame perfect Nash equilibrium
  - Readings
    - *Games of Strategy*, Chapters on sequential-move games
  - Application
    - Classroom trust game with discussion

9/18
- Sequential-move games and subgame perfect Nash equilibrium (continued)
  - Third student presentation based on:
    - Camerer, F. 2003. Behavioral game theory. Sections 2.7 and 2.8
  - Fourth student presentation based on:
    - Camerer, F. 2003. Behavioral game theory. Sections 4.1 and 4.2

9/20
- Refinements of and departures from equilibrium and backward induction

- Readings
  - Weibull, J. 2004. "Testing Game Theory." In *Advances in Understanding Strategic Behaviour: Game Theory, Experiments and Bounded Rationality: Essays in Honour of Werner Güth*, ed. S. Huck. Basingstoke, UK: Palgrave Macmillan
  - Supplementary material on strategic reasoning (level-k models)
- Application
  - Classroom beauty contest game with discussion

9/25

- Games of imperfect information
  - Readings
    - *Games of Strategy*, Chapter 9
  - Application
    - Signaling game with discussion

9/27: Exam 1 (all material up to now)

Behavioral

10/2

- Departures from expected utility: Prospect theory and other non-expected utilities
  - Readings
    - Kahneman, D. and A. Tversky. 1979. Prospect Theory: An Analysis of Decision under Risk. *Econometrica* 47 (2): 263-292
    - Barberis, N. C. 2013. Thirty Years of Prospect Theory in Economics: A Review and Assessment. *Journal of Economic Perspectives* 27 (1): 173-96
  - Application
    - Classroom risk experiment and discussion

10/4

- Departures from expected utility: Prospect theory and other non-expected utilities (continued)
  - Fifth student presentation based on:
    - Harrison, G. and L. Rutstrom. Expected utility theory and prospect theory: one wedding and a decent funeral. *Experimental economics* 12 (2): 133-158
  - Sixth student presentation based on:
    - Charness, G. and A. C. G. Viceisza. 2016. Three risk-elicitation methods in the field: Evidence from rural Senegal. *Review of Behavioral Economics* 3 (2): 145-171.

10/9-10/11

- NO CLASS DUE TO FALL BREAK
- ***Class time to be used for Stage 2 of the RP, which is due on 10/15!!!***

10/16

- Departures from exponential discounting: Present bias (or not) and non-standard discounting

- Readings
  - Laibson, D. 1997. Golden Eggs and Hyperbolic Discounting. *Quarterly Journal of Economics* 112 (2): 443–477
  - Frederick, S., Loewenstein, G. and T. O'Donoghue. 2002. Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature* 40 (2): 351–401
- Application
  - Classroom time experiment and discussion

10/18

- Departures from exponential discounting: Present bias (or not) and non-standard discounting (continued)
  - Seventh student presentation based on:
    - Andersen, S., G. W. Harrison, M. I. Lau, and E. E. Rutström. 2008. "Eliciting Risk and Time Preferences." *Econometrica* 76 (3): 583–618.
  - Eighth student presentation based on:
    - Ashraf, N., D. Karlan, and W. Yin. 2006. Tying Odysseus to the mast: Evidence from a commitment savings product in the Philippines. *Quarterly Journal of Economics* 121 (2): 635-672

10/20: Midterm grades submitted

10/23

- Non-Bayesian information processing
  - Readings
    - Supplementary handouts
  - Ninth student presentation based on:
    - Rabin, M., and D. Vayanos. 2010. The Gambler's and Hot-Hand Fallacies: Theory and Applications. *Review of Economic Studies* 77 (2): 730-778

10/25

- Departures from rationality and other behavioral anomalies (framing, endowment, mental accounting, bounded rationality, reference dependence, status quo, and so on)
  - Readings
    - Supplementary handouts and/or readings
  - Tenth student presentation based on:
    - Plott, C. and K. Zeiler. 2005. The Willingness to Pay–Willingness to Accept Gap, the "Endowment Effect," Subject Misconceptions, and Experimental Procedures for Eliciting Valuations. *American Economic Review* 95 (3): 530-545.

10/27: Last day to withdraw with a "W"

Experimental

10/30

- Experimental approach I: Design and treatments
  - Readings
    - Smith, V. L. 1976. Experimental Economics: Induced Value Theory. *American Economic Review* 66 (2): 274-279
    - Guide by Viceisza, Chapters 1 and 2

11/1

- Experimental approach I: Design and treatments (continued)

- Readings
  - Smith, V. L. 1982. Microeconomic Systems as Experimental Science. *American Economic Review* 72 (5): 923-995
- Eleventh student presentation based on:
  - Viceisza, A. C. G. 2016. Creating a Lab in the Field: Economics Experiments for Policymaking. *Journal of Economic Surveys* 30 (5): 835-854

11/6

- Experimental approach II: Protocol and implementation
  - Readings
    - Guide by Viceisza, Chapters 1 and 2 (continued)
  - Twelfth student presentation based on:
    - Duflo, E., R. Glennerster, and M. Kremer. 2007. "Using Randomization in Development Economics Research: A Toolkit." In *Handbook of Development Economics*, ed. T. P. Schultz and J. Strauss. Amsterdam: Elsevier Science

11/8

- Power and Sample size
  - Readings
    - Guide by Viceisza, Chapter 2
    - Spybrook, J., H. Bloom, R. Congdon, C. Hill, A. Martinez, and S. W. Raudenbush. 2011. "Optimal Design Plus Empirical Evidence: Documentation for the 'Optimal Design' Software." https://sites.google.com/site/optimaldesignsoftware/home.

11/13: Exam 2 (all material between Exams 1 and 2)

11/15

- Inferences from experiments: Statistics, econometrics, internal and external validity
  - Readings
    - Guide by Viceisza, Chapter 4
    - Falk, A., and J. J. Heckman. 2009. Lab Experiments Are a Major Source of Knowledge in the Social Sciences. *Science* 326 (5952): 535-538.
    - Athey, S., and G. W. Imbens. 2017. The State of Applied Econometrics: Causality and Policy Evaluation. *Journal of Economic Perspectives* 31 (2): 3-32.

11/20-11/22

- NO CLASS DUE TO THANKSGIVING

11/27

- ***Stage 3 of proposal due!!!***
- Student presentations of RPs (5-10 minutes each)

11/29

- If need be, final student presentations of RPs
- Review: tying it all together

COMPREHENSIVE FINAL EXAM DURING THE WEEK OF DEC 4-8 (EXACT DATE TBA)

GRADING RUBRIC FOR THE RESEARCH PROPOSAL

Rank	Content Quality	Quality of Written Exposition	Approximate score
Excellent	The proposal is technically strong in that it comprises (1) an excellent literature review, (2) a well-developed theoretical model, (3) a tight empirical strategy to test the hypotheses derived from 2, (4) a discussion of policy implications, and (5) a discussion of ways forward.	The proposal is written in an academic manner, following typical standards observed in the literature. This applies both to the use of the English language (grammar, spelling, and so on), but also to the use of mathematical notation. Notation needs to be used as appropriate and be properly defined. The student should use academic articles in top peer-reviewed journals as a guide (see course reading list for examples of such articles).	90-100
Very Good	The proposal is strong in categories (1), (2), (3), and (5), but is weak in category (4).	The proposal uses notation inappropriately.	85-89
Good	The proposal is strong in categories (1), (2), and (3), but is weak in categories (4) and (5).	The proposal uses notation inappropriately and does not necessarily read as an academic article.	80-84
Fair	The proposal is weak in any of the categories (1), (2), or (3).	Same as former.	75-79
Limited	The proposal is weak in one or more of the categories (1), (2), and (3).	Same as former.	70-74
Weak	The proposal is weak in all categories.	Same as former.	69 and below

Other tips/issues for consideration for the RP:

1. It is imperative that you start with a proper research question that is informed by and sufficiently different from prior literature.
2. Generally, references must come from a reputable source; e.g. journal articles or working papers from www.nber.org. Discuss with me during office hours to get insights into additional references.
3. Use the journal articles or working papers on the syllabus as a guide for what your RP should look like (except for the detailed empirical sections).
4. Make sure to differentiate clearly between a theoretical model (particularly important in this course) and an empirical model (i.e. what you are used to in econometrics). Your theoretical model informs the latter, but they are not the same.
5. Bear in mind that a theoretical model is important because it gives a framework for formally deriving hypotheses, which in turn can be tested using real-world data. These data can come from some combination of:
    - Experiments (lab and/or field), particularly relevant in this course.
    - Surveys.
    - Administrative data (e.g. Census).
    - These data can be primary in that you will design the instruments and collect them or secondary in that they already exist (because someone else collected them) and you will obtain access/use them for your purposes.