SOC6708H Advanced Data Analysis: Age-Period Cohort Models (Winter 2020)

Instructor: Prof. Ethan Fosse
Class Hours and Location: Mondays 5pm-7pm, Room 240 (725 Spadina)
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1 Course Description & Goals

Over the past two decades there has been an enormous increase in the number of studies using age-period-cohort (APC) models to understand social change. No discipline in the social sciences has been unaffected by this revolution. However, confusion abounds on the appropriate application, interpretation, and scope of APC models. This course provides an overview of how applied researchers can conduct theoretically-motivated APC analyses while avoiding common mistakes. Topics covered include visualization techniques, multilevel/hierarchical models, Moore-Penrose estimators, bounding/sensitivity analyses, and mechanism-based causal models. Some familiarity with multiple linear regression is helpful, but not required. Examples will be shown using the R programming language but general principles will be given for other statistical software.

2 Course Resources

Quercus Website: The course website will have additional information on the course mechanics, lecture materials, and readings. Note that all assignments will be submitted entirely through course website, which will be updated as the course begins. The course website may be accessed via the University of Toronto’s Quercus platform.

Weekly Readings: This course includes required and supplementary weekly readings. Only those weekly readings listed in this syllabus as “required readings” are, in fact, required. The supplementary weekly readings are not necessary for succeeding in this course and are offered only to give you deeper insight on particular topics and techniques. All readings will be posted on the course website.

Statistical Software: This course is focused primarily on helping you learn the basic concepts and principles underlying APC modeling. Accordingly, you are not required to learn any statistical software. Moreover, to the extent you conduct any empirical analyses, you may use any statistical software of your choice, including but not limited to Excel, Python, SAS, SPSS, and Stata. However, learning statistical concepts is generally aided by analyzing data using statistical software. Because of its popularity and applicability, to the extent any examples are presented in this course will focus on using R with RStudio. R is the underlying programming language, while RStudio is a graphical user interface that makes working with R much easier. Both are free, open-source, and used widely by statisticians. In this course, when we refer to R this should
be viewed as shorthand for using R with RStudio. To install R with RStudio, go to the this link and click on the installer for your computer’s operational system.

3 Evaluation Components

Fall students, your grade will be based on the following:

1. **Class Participation**: You must not only attend but actively participate in class discussions throughout course. Class participation is worth 20% of your overall grade.

2. **Critical Review Essay**: You must submit a short paper (between 3 to 7 pages) critically analyzing a published paper using at least one temporal variable (i.e., age, period, or cohort). Details will be given at the beginning of the course. The due date for this assignment is **March 3, 2020 by 11:59pm Eastern Standard Time (EST)**. The critical review essay is worth 30% of your overall grade.

3. **Research Paper**: You must submit a longer, final research paper (between 15-25 pages) related to the course topics, typically either an empirical analysis or a theoretical piece. Details will be given at the beginning of the course. The due date for this assignment is **April 17, 2020 by 11:59pm Eastern Standard Time (EST)**. The research paper is worth 50% of your overall grade.

**Instructions on Submitting Papers**: All papers must be submitted via the course website. **Only Adobe pdf documents will be allowed.** Papers should be written using standard 12 point font, double spacing, and without a separate title page. All works should be referenced using American Sociological Association (ASA) style.

**Late Penalty**: Unless there is a documented reason beyond one’s control (e.g., an illness or emergency), there will be a 5% deduction for each day the assignment is late.

4 Tentative Session Topics & Readings

**Part I: Foundations**

**Week 1: Theoretical Foundations (January 6)**

*Required Readings*


**Supplementary Readings**


**Week 2: Overview of APC Analysis (January 13)**

**Required Readings**


**Supplementary Readings**


**Week 3: The APC Identification Problem (January 20)**

**Required Readings**


**Supplementary Readings**


Week 4: Splines & Generalized Additive Models (January 27)

Required Readings


Supplementary Readings


Week 5: Equality Constraints & Proxy Variables (February 3)

Required Readings


Supplementary Readings


Week 6: Hierarchical Models & Moore-Penrose Estimators (February 10)

Required Readings


Supplementary Readings


Week 7: No Class (February 17)

Week 8: Trend Analysis with APC Models (February 24)

Required Readings


Supplementary Readings


Week 9: Bounding Analyses of Temporal Effects (March 2)

Required Readings


Supplementary Readings


Week 10: Mechanism-Based Models of APC Effects (March 9)

Required Readings


Supplementary Readings


Week 11: Bayesian APC Models (March 16)

Required Readings


Supplementary Readings


Week 12: APC Analysis with Comparison Groups (March 23)

Required Readings


Supplementary Readings


Riebler, Andrea, Leonhard Held, Havard Rue, and Matthias Bopp. 2012. “Gender-Specific Differences and the Impact of Family Integration on Time Trends in Age-Stratified


**Week 13: Using Qualitative & Subjective Data (March 30)**

*Required Readings*


*Supplementary Readings*


5 **Academic Integrity**

Copying, plagiarizing, falsifying medical certificates, or other forms of academic misconduct will not be tolerated. Any student caught engaging in such activities will be referred to the Dean’s office for adjudication. Any student abetting or otherwise assisting in such misconduct will also be subject to academic penalties. Students are expected to cite sources in all written work and presentations. See this link for tips for how to use sources effectively.

According to Section B.I.1.(e) of the Code of Behaviour on Academic Matters it is an offense “to submit, without the knowledge and approval of the instructor to whom it is submitted, any academic work for which credit has previously been obtained or is being sought in another course or program of study in the University or elsewhere.” By enrolling in this course, you agree to abide by the university’s rules regarding academic conduct. You are expected to be familiar with the **Code of Behaviour on Academic Matters** and **Code of Student Conduct**, which spell out your rights and provide all relevant details on academic responsibilities at the University of Toronto.
6 Accessibility Services

It is the University of Toronto’s stated goal to create a community that is inclusive of all persons and treats all members of the community in an equitable manner. In creating such a community, the University aims to foster a climate of understanding and mutual respect for the dignity and worth of all persons. Please see the University of Toronto Governing Council’s Statement of Commitment Regarding Persons with Disabilities. In working toward this goal, the University has committed to supporting and facilitating the accommodation of individuals with disabilities so that all may share the same level of access to opportunities, participate in the full range of activities that the University offers, and achieve their full potential as members of the community.

Students seeking support must have an interview with a disability adviser to discuss their individual needs. In many instances it is easier to arrange certain accommodations with advance notice, so you are strongly encouraged to act as quickly as possible. To schedule a registration appointment with a disability adviser, please visit Accessibility Services or call 416-978-8060. The office is located at 455 Spadina Avenue, 4th Floor, Suite 400. Additional student resources for distressed or emergency situations can be found here. You may also contact the Health & Wellness Centre at 416-978-8030 or Student Crisis Response at 416-946-7111.

7 Equity and Diversity

The University of Toronto has a public commitment to equity and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect. As the course instructor, I will neither condone nor tolerate behavior that undermines the dignity or self-esteem of any individual in this course and wish to be alerted to any attempt to create an intimidating or hostile environment. It is our collective responsibility to create a space that is inclusive and welcomes discussion. Discrimination, harassment, and hate speech of any kind will not be tolerated. Additional information on Equity and Diversity at the University of Toronto is available here.