# ECO 7427: Econometric Methods II

Spring 2020: Monday/Wednesday 11:45 am - 1:40 pm at MAT 112

Instructor:	Prof. Hector H. Sandoval <i>hsandoval@ufl.edu</i> MAT 325 Office hours: Monday 1:45 - 3:45 pm (or by appointment)
TA:	Armand Kapllani akapllani@ufl.edu MAT 322 Office hours: Friday 10:00 am - 12:00 pm

#### **Course Description**

This course is part of the Ph.D. Econometrics and Public Economics sequences. It is intended to be an applied econometrics class focusing on how to use econometrics to address causal questions and more generally on how to conduct empirical research in applied microeconomics. The focus of the course will be to link student's preparation in formal econometrics to data. The first part of the course will cover a number of topics that are useful in conducting empirical research. The second part will cover the theory and econometrics of social interactions and social networks with a particular emphasis in the topic of peer effects in education.

## **Assignments & Grading**

Grades will be distributed as follows: assignments 60%, final project 20%, and presentation 20%. For the assignments, you are encouraged to collaborate with other students, but you should submit your own individual work. Problem sets submitted after the deadline are **not** accepted. The final project will involve writing an empirical paper and presenting it at the end of the semester. You may work in groups of two for the final project and presentation.

## Lecture Notes & Textbooks

The main materials for this course will be the lecture slides available on Canvas. The book by Hansen is an excellent graduate-level textbook in econometrics. The books by Cameron & Trivedi provide a comprehensive treatment of microeconometrics, emphasizing Stata. The book by Imbens & Rubin lay out the assumptions needed for causal inference and describe the leading analysis methods. Both Angrist & Pischke books provide intuitive and practical explanations for some of the topics. Cattaneo *et al.* is an accessible and practical guide for the analysis and interpretation of regression discontinuity (RD) designs. The textbook by Jackson provides a comprehensive overview and synthesis of models and techniques for analyzing social and economic network. Finally, the book by Manski provides a comprehensive discussion of his work on identification. For the corresponding topic, I reference chapters from these difference sources throughout the

course.

- Angrist, J. D., & Pischke, J. S. (2008). Mostly Harmless Econometrics: An Empiricist's Companion. Princeton university press.
- Angrist, J. D., & Pischke, J. S. (2014). Mastering 'Metrics: The Path from Cause to Effect. Princeton University Press.
- Cameron, A. C., & Trivedi, P. K. (2005). Microeconometrics: Methods and Applications. Cambridge University Press.
- Cameron, A. C., & Trivedi, P. K. (2010). Microeconometrics Using Stata (Revised Edition). Stata Press.
- Cattaneo, M., Idrobo, N., & Titiunik, R. (2020). A Practical Introduction to Regression Discontinuity Designs: Foundations. Cambridge University Press. (cattaneo.princeton.edu/ publications)
- Hansen, B. (2019) Econometrics. (www.ssc.wisc.edu/~bhansen/econometrics/)
- Imbens, G. W., & Rubin, D. B. (2015). Causal Inference in Statistics, Social, and Biomedical Sciences. Cambridge University Press.
- Jackson, M. O. (2010). Social and Economic Networks. Princeton University Press.
- Manski, C. F. (2009). Identification for Prediction and Decision. Harvard University Press.

## Policies

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/.

Students with disabilities requesting accommodations should should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code

(https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

# Course Outline & Schedule (subject to change)

Monday	WEDNESDAY
Jan 6th	8th
Lecture 1: Introduction - Recan	
13th	15th
	Lecture 2: Identification
20th	22nd
Holiday - NO CLASS	
27th	29th
Lecture 3: Causality & RCT	
Fab 3rd	Sth
1.00 510	Assignment #1 due
	Assignment #1 aue
10th	12th
Lecture 4: Matching	
17th	10tb
Lecture 5: Terries in IV	1901
Lecture 5: Topics in TV	
24th	26th
	Lecture 6: Panel Data
	Assignment #3 due
Mar 2nd	4th
Spring break - NO CLASS	Spring break - NO CLASS
9th	11th
Lecture 7: Topics in Diff-in-Diff	
Assignment #2 due	
16th	18th
	Lecture 8: Regression Discontinuity
	25th
2510	Lecture 9: Microeconomic Policy Evaluation
	Assignment #4 due
20+h	Ann 1st
	Aprist
Lecture 10: Social Interactions	
6th	8th
	NO CLASS
	17.1
13th	15th
	Lecture 11: Social Networks
20th	22nd
Student presentation	Student presentation (cont.)
	Assignment #5 due
27th	29th
	Final project due

# **Detailed Reading List** (Required readings: † = Methodology; ‡=Empirical paper)

## [01/06] Lecture 1: Introduction - Recap «3 lectures»

- ▷ Estimand, estimator, and estimate
- Conditional expectation function and least squares
- ▶ Inference

#### **Readings:**

- † Hansen (2019) Chapters 1 4.
- † Angrist, J. D., & Pischke, J. S. (2008) Chapter 8.

Cameron, A. C., & Miller, D. L. (2015). A Practitioner's Guide to Cluster-Robust Inference. *Journal of Human Resources*, 50(2), 317-372.

Duflo, E., Dupas, P., & Kremer, M. (2011). Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya. *The American Economic Review*, 101(5), 1739-1774.

#### [01/15] Lecture 2: Identification - Recap «2 lectures»

- Prediction with incomplete data
- Analysis of treatment response

#### **Readings:**

† Manski (2009) Chapters 1 - 3, 7.

#### [01/27] Lecture 3: Causality & RCT «4 lectures»

- ▷ Potential outcomes, treatment effects & RCT
- Randomized experiments
- Experimental approach to development economics
- ▷ Conditional cash transfer program: Progresa/Oportunidades

- † Angrist, J. D., & Pischke, J. S. (2014) Chapter 1.
- † Imbens, G. W., & Rubin, D. B. (2015) Chapters 1 3, 7.
- <sup>‡</sup> Angelucci, M., & De Giorgi, G. (2009). Indirect effects of an aid program: how do cash transfers affect ineligibles' consumption?. *The American Economic Review*, 99(1), 486-508.

Athey, S., & Imbens, G. W. (2017). The Econometrics of Randomized Experiments. In Handbook of Economic Field Experiments (Vol. 1, pp. 73-140). North-Holland.

- <sup>†</sup> Banerjee, A. V., & Duflo, E. (2009). The Experimental Approach to Development Economics. *Annual Review of Economic*, 1(1), 151-178
- <sup>†</sup> Deaton, A., & Cartwright, N. (2018). Understanding and Misunderstanding Randomized Controlled Trials. *Social Science & Medicine*, 210, 2-21.
- <sup>†</sup> Cox, D. R. (1992). Causality: Some Statistical Aspects. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, 291-301.
- <sup>†</sup> Heckman, J. J. (1991). Randomization and Social Policy Evaluation. *National Bureau of Economic Research*, Technical Working Paper No. 107.

Heckman, J. J., & Smith, J. A. (1995). Assessing the Case for Social Experiments. *The Journal of Economic Perspectives*, 9(2), 85-110.

<sup>†</sup> Holland, P. (1986). Statistics and Causal Inference. *Journal of the American Statistical Association*, 81(396), 945-960.

Hudgens, M. G., & Halloran, M. E. (2008). Toward Causal Inference with Interference. *Journal of the American Statistical Association*, 103(482), 832-842.

‡ Kling, J. R., Ludwig, J., & Katz, L. F. (2005). Neighborhood Effects on Crime for Female and Male Youth: Evidence from a Randomized Housing Voucher Experiment. *The Quarterly Journal of Economics*, 120(1), 87-130.

Manski, C. F. (2013). Identification of Treatment Response with Social Interactions. *The Econometrics Journal*, 16(1), S1-S23.

- ‡ Miguel, E., & Kremer, M. (2004). Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities. *Econometrica*, 72(1), 159-217.
- ‡ Parker, S. W., & Todd, P. E. (2017). Conditional Cash Transfers: The Case of Progresa/Oportunidades. *Journal of Economic Literature*, 55(3), 866-915.

Ravallion, M. (2018). Should the Randomistas (Continue to) Rule?. *Center for Global Development Working Paper*, 492.

<sup>†</sup> Rubin, D. B. (1974). Estimating Causal Effects of Treatments in Randomized and Nonrandomized Studies. *Journal of Educational Psychology*, 66(5), 688.

Sobel, M. E. (2006). What Do Randomized Studies of Housing Mobility Demonstrate? Causal Inference in the Face of Interference. *Journal of the American Statistical Association*, 101(476), 1398-1407.

# [01/27] Lecture 4: Matching «2 lectures»

- Matching & Propensity Score Matching
- Ex-ante Program Evaluation

- † Imbens, G. W., & Rubin, D. B. (2015) Chapters 12 13.
- <sup>†</sup> Caliendo, M., & Kopeinig, S. (2008). Some Practical Guidance for the Implementation of Propensity Score Matching. *Journal of Economic Surveys*, 22(1), 31-72.
- Dehejia, R. H., & Wahba, S. (2002). Propensity Score Matching Methods for Nonexperimental Causal Studies. *The review of Economics and Statistics*, 84(1), 151-161.

Heckman, J. J., Ichimura, H., & Todd, P. (1998). Matching as an Econometric Evaluation Estimator. *The Review of Economic Studies*, 65(2), 261-294.

Imbens, G. W. (2015). Matching Methods in Practice: Three Examples. *Journal of Human Resources*, 50(2), 373-419.

- ‡ LaLonde, R. J. (1986). Evaluating the Econometric Evaluations of Training Programs with Experimental Data. *The American Economic Review*, 604-620.
- Lechner, M. (2002). Program Heterogeneity and Propensity Score Matching: An application to the Evaluation of Active Labor Market Policies. *The Review of Economics and Statistics*, 84(2), 205-220.
- <sup>†</sup> Rosenbaum, P. R., & Rubin, D. B. (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika*, 70(1), 41-55
- <sup>†</sup> Smith, J. A., & Todd, P. E. (2005). Does Matching Overcome LaLonde's critique of Nonexperimental Estimators? *Journal of Econometrics*, 125(1), 305-353.

Black, D. A., & Smith, J. A. (2004). How Robust is the Evidence on the Effects of College Quality? Evidence From Matching. *Journal of Econometrics*, 121(1), 99-124.

Jalan, J., & Ravallion, M. (2003). Does Piped Water Reduce Diarrhea for Children in Rural India?. *Journal of Econometrics*, 112(1), 153-173

<sup>†</sup> Todd, P. E., & Wolpin, K. I. (2008). Ex ante Evaluation of Social Programs. *Annales d'Economie et de Statistique*, 263-291.

Mueser, P. R., Troske, K. R., & Gorislavsky, A. (2007). Using State Administrative Data to Measure Program Performance. *The Review of Economics and Statistics*, 89(4), 761-783.

#### [02/13] Lecture 5: Topics in Instrumental Variables «3 lectures»

- ▶ Instrumental variables
- Local Average Treatment Effects (LATE)
- ▶ IV in Randomized Trials

- † Angrist, J. D., & Pischke, J. S. (2014) Chapter 3.
- † Hansen (2019) Chapter 12.

Angrist, J. D. (1990). Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records. *The American Economic Review*, 313-336.

Angrist, J. D., Imbens, G. W., & Rubin, D. B. (1996). Identification of Causal Effects Using Instrumental Variables. *Journal of the American statistical Association*, 91(434), 444-455.

‡ Angrist, J. D., & Keueger, A. B. (1991). Does compulsory school attendance affect schooling and earnings?. *The Quarterly Journal of Economics*, 106(4), 979-1014.

Bloom, H. S. (1984). Accounting for No-shows in Experimental Evaluation Designs. *Evaluation Review*, 8(2), 225-246.

Bloom, H. S., Orr, L. L., Bell, S. H., Cave, G., Doolittle, F., Lin, W., & Bos, J. M. (1997). The Benefits and Costs of JTPA Title II-A programs: Key Findings from the National Job Training Partnership Act study. *Journal of Human Resources*, 32(3).

- <sup>‡</sup> Bound, J., Jaeger, D. A., & Baker, R. M. (1995). Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak. *Journal of the American Statistical Association*, 90(430), 443-450.
- ‡ Dynarski, S., Libassi, C. J., Michelmore, K., & Owen, S. (2018). Closing the gap: The effect of a targeted, tuition-free promise on college choices of high-achieving, low-income students. *National Bureau of Economic Research*, Working Paper No. 25349.
- ‡ Fowlie, M., Greenstone, M., & Wolfram, C. (2018). Do energy efficiency investments deliver? Evidence from the weatherization assistance program. The Quarterly Journal of Economics, 133(3), 1597-1644.
- <sup>†</sup> Gandhi, R., Knittel, C. R., Pedro, P., & Wolfram, C. (2016). Running randomized field experiments for energy efficiency programs: A practitioner's guide. *Economics of Energy & Environmental Policy*, 5(2), 7-26.

Hahn, J., & Hausman, J. (2003). Weak instruments: Diagnosis and Cures in Empirical Econometrics. *The American Economic Review*, 93(2), 118-125.

- ‡ Heckman, J. J. (1996). Randomization as an Instrumental Variable. The Review of Economics and Statistics, 336-341.
- Imbens, G. W., & Angrist, J. D. (1994). Identification and Estimation of Local Average Treatment Effects. *Econometrica*, 62(2), 467-475.

Murray, M. P. (2006). Avoiding Invalid Instruments and Coping with Weak Instruments. *The Journal of Economic Perspectives*, 20(4), 111-132.

Staiger, D., & Stock, J. H. (1997). Instrumental Variables Regression with Weak Instruments. *Econometrica*, 65(3), 557-586.

‡ Stock, J. H., Wright, J. H., & Yogo, M. (2002). A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments. *Journal of Business & Economic Statistics*, 20(4), 518-529. ▷ Random Effects, Fixed Effects, and First Difference

# **Readings:**

- † Hansen (2019) Chapter 17.
- <sup>‡</sup> Almond, D., Chay, K. Y., & Lee, D. S. (2005). The Costs of Low Birth Weight. *The Quarterly Journal of Economics*, 120(3), 1031-1083.
- Bleakley, H. (2010). Malaria Eradication in the Americas: A Retrospective Analysis of Childhood Exposure. American Economic Journal: Applied Economics, 2(2), 1-45.

Bond, S. R. (2002). Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice. *Portuguese Economic Journal*, 1(2), 141-162.

# [03/09] Lecture 7: Difference-in-Differences «3 lectures»

- ▷ Sharp & Fuzzy Difference-in-Differences (DiD), and Extensions
- Synthetic Control Group
- ▶ Application: Wage Impacts

# **Readings:**

- † Angrist, J. D., & Pischke, J. S. (2014) Chapter 5.
- † Hansen (2019) Chapter 18.

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. American economic review, 93(1), 113-132.

- † Abadie, A., Diamond, A., & Hainmueller, J. (2010). Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program. Journal of the American statistical Association, 105(490), 493-505.
- <sup>†</sup> Abadie, A., Diamond, A., & Hainmueller, J. (2015). Comparative politics and the synthetic control method. American Journal of Political Science, 59(2), 495-510.
- ‡ Adda, J., & Cornaglia, F. (2010). The Effect of Bans and Taxes on Passive Smoking. American Economic Journal: Applied Economics, 2(1), 1-32

Athey, S., & Imbens, G. W. (2006). Identification and Inference in Nonlinear Difference-in-Differences Models. Econometrica, 74(2), 431-497.

- <sup>†</sup> Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How Much Should We Trust Differencesin-Differences Estimates?. *The Quarterly Journal of Economics*, 119(1), 249-275.
- ‡ Bohn, S., Lofstrom, M., & Raphael, S. (2014). Did the 2007 Legal Arizona Workers Act reduce the state's unauthorized immigrant population?. *Review of Economics and Statistics*, 96(2), 258-269.

- ‡ Borjas, G. J. (2017). The Wage Impact of the Marielitos: A Reappraisal. ILR Review, 70(5), 1077-1110.
- ‡ Card, D. (1990). The Impact of the Mariel Boatlift on the Miami Labor Market. *ILR Review*, 43(2), 245-257.

Conley, T. G., & Taber, C. R. (2011). Inference with "Difference in Differences" with a Small Number of Policy Changes. *The Review of Economics and Statistics*, 93(1), 113-125.

- <sup>†</sup> de Chaisemartin, C., & D'Haultfœuille, X. (2017). Fuzzy Differences-in-Differences. *The Review of Economic and Studies*.
- Duflo, E. (2001). Schooling and Labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment. *The American Economic Review*, 91(4), 795-813.

Eissa, N., & Liebman, J. B. (1996). Labor supply response to the earned income tax credit. *The Quarterly Journal of Economics*, 111(2), 605-637.

Eissa, N., & Hoynes, H. W. (2004). Taxes and the labor market participation of married couples: the earned income tax credit. *Journal of Public Economics*, 88(9), 1931-1958.

- <sup>†</sup> Lechner, M. (2011). The Estimation of Causal Effects by Difference-in-Difference Methods. *Foundations and Trends in Econometrics*, 4(3), 165-224.
- ‡ Muralidharan, K., & Prakash, N. (2017). Cycling to school: Increasing Secondary School Enrollment for Girls in India. *American Economic Journal: Applied Economics*, 9(3), 321-50.
- ‡ Peri, G., & Yasenov, V. (2019). The Labor Market Effects of a Refugee Wave Synthetic Control Method Meets the Mariel Boatlift. *Journal of Human Resources*, 54(2), 267-309.

Lee, M. J., & Kang, C. (2006). Identification for Difference in Differences with Cross-Section and Panel Data. *Economics Letters*, 92(2), 270-276.

#### [03/183] Lecture 8: Regression Discontinuity «2 lectures»

Sharp & Fuzzy Regression Discontinuity

- † Angrist, J. D., & Pischke, J. S. (2014) Chapter 4.
- † Cattaneo, M., Idrobo, N., & Titiunik, R. (2020)
- <sup>‡</sup> Anderson, M., Dobkin, C., & Gross, T. (2012). The Effect of Health Insurance Coverage on the Use of Medical Services. *American Economic Journal: Economic Policy*, 4(1), 1-27.
- ‡ Angrist, J. D., & Lavy, V. (1999). Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement. *The Quarterly Journal of Economics*, 114(2), 533-575.

Card, D., Dobkin, C., & Maestas, N. (2008). The impact of nearly universal insurance coverage on health care utilization: evidence from Medicare. *The American Economic Review*, 98(5), 2242-58.

‡ Carpenter, C., & Dobkin, C. (2009). The Effect of Alcohol Consumption on Mortality: Regression Discontinuity Evidence from the Minimum Drinking Age. American Economic Journal: Applied Economics, 1(1), 164-182

Carpenter, C., & Dobkin, C. (2011). The minimum legal drinking age and public health. *The Journal of Economic Perspectives*, 25(2), 133-156.

Hahn, J., Todd, P., & Van der Klaauw, W. (2001). Identification and Estimation of Treatment Effects with a Regression Discontinuity Design. *Econometrica*, 69(1), 201-209.

Imbens, G. W., & Lemieux, T. (2008). Regression Discontinuity Designs: A Guide to Practice. *Journal of Econometrics*, 142(2), 615-635.

‡ Jepsen, C., Mueser, P., & Troske, K. (2016). Labor Market Returns to the GED using Regression Discontinuity Analysis. *Journal of Political Economy*, 124(3), 621-649.

Jepsen, C., Mueser, P., & Troske, K. (2017). Second Chance for High School Dropouts? A Regression Discontinuity Analysis of Postsecondary Educational Returns to the GED. *Journal of Labor Economics*, 35(S1), S273-S304.

Lee, D. S. (2008). Randomized Experiments from Non-random Selection in US House elections. *Journal of Econometrics*, 142(2), 675-697.

Lee, D. S., & Lemieux, T. (2010). Regression Discontinuity Designs in Economics. *Journal of Economic Literature*, 48(2), 281-355.

#### [03/25] Lecture 9: Microeconomic Policy Evaluation «1 lecture»

Review of Methods: Experiments, Natural Experiments, Discontinuity, Matching, IV, & Control Function

# **Readings:**

Abadie, A., & Cattaneo, M. D. (2018). Econometric Methods for Program Evaluation. *Annual Review of Economics*, 10, 465-503.

- <sup>†</sup> Athey, S., & Imbens, G. W. (2017). The State of Applied Econometrics: Causality and Policy Evaluation. *Journal of Economic Perspectives*, 31(2), 3-32.
- <sup>†</sup> Blundell, R., & Dias, M. C. (2009). Alternative approaches to evaluation in empirical microeconomics. *Journal of Human Resources*, 44(3), 565-640.

Meyer, B. D. (1995). Natural and quasi-experiments in economics. *Journal of Business & Economic Statistics*, 13(2), 151-161.

Rosenzweig, M. R., & Wolpin, K. I. (2000). Natural" natural experiments" in economics. *Journal of Economic Literature*, 38(4), 827-874.

# [03/30] Lecture 10: Social Interactions «4 lectures»

- Social Interactions: Background
- Social Interactions: Econometrics

# **Readings:**

† Akerlof, G. A. (1997). Social distance and social decisions. Econometrica, 1005-1027.

Becker, G. S. (1973). A theory of marriage: Part I. Journal of Political economy, 81(4), 813-846.

Blume, L. E., Brock, W. A., Durlauf, S. N., & Jayaraman, R. (2015). Linear social interactions models. *Journal of Political Economy*, 123(2), 444-496.

- <sup>†</sup> Blume, L. E., Brock, W. A., Durlauf, S. N., & Ioannides, Y. M. (2010). Identification of social interactions. *Handbook of Social Economics*
- <sup>†</sup> Bramoullé, Y., Djebbari, H., & Fortin, B. (2009). Identification of peer effects through social networks. *Journal of Econometrics*, 150(1), 41-55.

Brock, W. A., & Durlauf, S. N. (2001). Discrete choice with social interactions. *The Review* of *Economic Studies*, 68(2), 235-260.

- ‡ Calvó-Armengol, A., Patacchini, E., & Zenou, Y. (2009). Peer Effects and Social Networks in Education. *The Review of Economic Studies*, 76(4), 1239-1267.
- ‡ Carrell, S., & Hoekstra, M. L. (2010). Externalities in the classroom: How children exposed to domestic violence affect everyone's kids. *American Economic Journal: Applied Economics*, 2(1), 211-228.

Carrell, S. E., Hoekstra, M., & Kuka, E. (2018). The long-run effects of disruptive peers. *The American Economic Review*, 108(11), 3377-3415.

Cooper, R., & John, A. (1988). Coordinating coordination failures in Keynesian models. *The Quarterly Journal of Economics*, 103(3), 441-463.

Cornelissen, T., Dustmann, C., & Schönberg, U. (2017). Peer Effects in the Workplace. *The American Economic Review*, 107(2), 425-56.

‡ Cipollone, P., & Rosolia, A. (2007). Social Interactions in High School: Lessons from an Earthquake. *The American Economic Review*, 97(3), 948-965.

Dahl, G. B., Løken, K. V., & Mogstad, M. (2014). Peer effects in program participation. *The American Economic Review*, 104(7), 2049-2074.

‡ De Giorgi, G., Pellizzari, M., & Redaelli, S. (2010). Identification of Social Interactions through Partially Overlapping Peer Groups. *American Economic Journal: Applied Economics*, 2(2), 241-275.

Durlauf, S. N. (2004). Neighborhood Effects. *Handbook of Regional and Urban Economics*, 4, 2173-2242.

Epple, D., & Romano, R. (2011). Peer Effects in Education: A Survey of the Theory and Evidence. *Handbook of Social Economics*, 1(11), 1053-1163.

Glaeser, E. L., Sacerdote, B., & Scheinkman, J. A. (1996). Crime and social interactions. *The Quarterly Journal of Economics*, 111(2), 507-548.

Goldsmith-Pinkham, P., & Imbens, G. W. (2013). Social Networks and the Identification of Peer Effects. *Journal of Business & Economic Statistics*, 31(3), 253-264.

Graham, B. S., & Hahn, J. (2005). Identification and Estimation of the Linear-in-means Model of Social Interactions. *Economics Letters*, 88(1), 1-6.

Guryan, J., Kroft, K., & Notowidigdo, M. J. (2009). Peer Effects in the Workplace: Evidence from Random Groupings in Professional Golf Tournaments. *American Economic Journal: Applied Economics*, 1(4), 34-68.

Hirano, K., & Hahn, J. (2010). Design of randomized experiments to measure social interaction effects. *Economics Letters*, 106(1), 51-53.

Lalive, R., & Cattaneo, M. A. (2009). Social Interactions and Schooling Decisions. *The Review of Economics and Statistics*, 91(3), 457-477.

<sup>†</sup> Manski, C. F. (1993). Identification of endogenous social effects: The reflection problem. *The Review of Economic Studies*, 60(3), 531-542.

Manski, C. (2000). Economic Analysis of Social Interactions. *The Journal of Economic Perspectives*, 14(3), 115-136.

Milgrom, P., & Roberts, J. (1990). Rationalizability, Learning, and Equilibrium in Games with Strategic Complementarities. *Econometrica*, 58(6), 1255-1277.

- <sup>†</sup> Moffitt, R. A. (2001). Policy Interventions, Low-level Equilibria, and Social Interactions. In Social dynamics, 4(45-82), 6-17.
- Sacerdote, B. (2001). Peer Effects with Random Assignment: Results for Dartmouth Roommates. *The Quarterly journal of Economics*, 116(2), 681-704.

Sacerdote, B. (2011). Peer effects in education: How might they work, how big are they and how much do we know thus far. *Handbook of the Economics of Education*, 3(3), 249-277.

‡ Waldinger, F. (2011). Peer effects in science: Evidence from the dismissal of scientists in Nazi Germany. *The Review of Economic Studies*, 79(2), 838-861.

## [04/15] Lecture 11: Social Networks «1 lecture»

Introduction to Social Networks

## **Readings:**

† Jackson, M. O. (2010) Chapters 1 - 2.

Ballester, C., Calvó-Armengol, A., & Zenou, Y. (2006). Who's Who in Networks. Wanted: The key Player. *Econometrica*, 74(5), 1403-1417.

‡ Banerjee, A., Chandrasekhar, A. G., Duflo, E., & Jackson, M. O. (2013). The Diffusion of Microfinance. *Science*, 341(6144), 1236498.

Banerjee, A., Chandrasekhar, A. G., Duflo, E., & Jackson, M. O. (201p). Using Gossips to Spread Information: Theory and Evidence from a Randomized Controlled Trial. *The Review of Economic Studies*, 86(6), 2453-2490.

Granovetter, M. S. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78(6), 1360-1380.

‡ Goyal, S., Van Der Leij, M. J., & Moraga-González, J. L. (2006). Economics: An Emerging Small World. *Journal of Political Economy*, 114(2), 403-412.

Jackson, M. O. (2011). An Overview of Social Networks and Economic Applications. *The Handbook of Social Economics*, 1, 511-85.