## Research Statement Leonardo Bursztyn University of Chicago

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The bulk of my work uses field experiments, often combined with observational data, to better understand how individuals' economic decisions are shaped by their social environment. Individuals make decisions within their household, students make decisions within their classroom, investors make financial decisions within their circle of friends. I study not only whether one's social environment shapes one's decisions, but also why one's social environment matters. In particular, my recent work focuses on the role of social pressure and social norms in shaping important economic decisions. My work has examined educational, labor market, financial, consumption, and political decisions, both in developing and developed countries. Although my research is mostly empirical, it is usually closely connected to economic theory and often seeks to disentangle competing theories not usually separable using only observational data. Whenever possible, my work combines field experiments with observational data from a more general setting. This helps establish a higher degree of external validity to my experimental findings and show that the mechanism of interest might be relevant in explaining important, naturally-occurring behavior outside of the analyzed experimental setting. In other lines of work, I have examined political economy issues, and also focused on a more macro approach to economic development, exploring the interplay between economic growth and environmental policy. I will now summarize my research contributions.

One of my main areas of research studies the role played by social interactions, both within the household and within the classroom, in schooling decisions, especially among low-income populations. I have studied these issues in the developing world and in the U.S. My paper "The Schooling Decision: Family Preferences, Intergenerational Conflict, and Moral Hazard in the Brazilian Favelas" (with Lucas C. Coffman, Journal of Political Economy, 2012, lead article) takes a close look at how poor households in urban areas of Brazil make schooling choices. We elicit parents' choices between monthly government transfers conditional on their adolescent child attending school and guaranteed unconditional transfers of varying sizes. In the baseline treatment, we find that an overwhelming majority of parents prefer conditional transfers to larger unconditional transfers. However, parents reveal much weaker preferences for the conditionality if either (i) their child is not informed that the conditionality would be dropped or (ii) if parents are offered to receive free text-message notifications whenever their child misses school. These findings suggest important intergenerational conflicts in schooling decisions, a lack of parental control and observability of school attendance, and an additional rationale for conditional cash transfer programs: the monitoring services they can provide.

More recently, I have become interested in understanding the sources of low academic achievement in

the U.S., and have studied the role of peer pressure in shaping academic investments. When effort or investment is observable to peers, students may act to avoid social penalties by conforming to prevailing norms. In the paper "How Does Peer Pressure Affect Educational Investments?" (with Robert Jensen, *Quarterly Journal of Economics*, 2015), we explore this hypothesis in two settings. We first consider a natural experiment that newly introduced a leaderboard into existing computer-based remedial high school courses, revealing top performers to the rest of the class. The result was a 24 percent decline in performance. The decline appears to be driven by a desire to avoid the leaderboard; for example, students performing at the top of the class prior to the change, those most at risk of appearing on the leaderboard, had a 40 percent decline in performance, while those previously at the bottom improved slightly. Our second setting involves a field experiment that offered students complimentary access to an online SAT preparatory course. Signup forms differed randomly across students only in the extent to which they emphasized that their decision would be kept private from classmates. In non-honors classes, the sign-up rate was 11 percentage points lower when decisions were public rather than private. Sign-up in honors classes was unaffected. To make sure the differential effects in honors and non-honors classes were not driven by differential selection of students into the two types of classes, we examined students taking both honors and non-honors classes. These students' response differed greatly based on which peers they happened to be sitting with at the time of the offer, and thus to whom their decision would be revealed. When offered the course in one of their non-honors classes (where peer sign-up rates are low), they were 15 percentage points less likely to sign up if the decision was public rather than private. But when offered the course in an honors class (where peer sign-up rates are high), they were 8 percentage points more likely to sign up if the decision was public. These results show that students are highly responsive to who their peers are and what the prevailing norm is when they make decisions. These findings may also carry policy implications. Changing either norms or peers is likely to be quite difficult, particularly on a large scale; but for at least some activities, changing the extent to which behavior is observable to peers is likely to be less so.

The paper "Cool to be Smart or Smart to be Cool? Understanding Peer Pressure in Education" (with Georgy Egorov and Robert Jensen, *Review of Economic Studies*, forthcoming) builds on Bursztyn and Jensen (2015) by modeling and testing for the importance of different mechanisms leading to negative peer pressure in US high schools. When students make educational choices that may appear to harm their long-run opportunities, what in particular are they trying to signal to their peers? Understanding this underlying motivation is likely to yield important insights both for understanding the root causes of educational underachievement and for designing corrective policy strategies. In this paper, we model and test two school-based peer cultures: one that stigmatizes effort (where it is "smart to be cool," similarly to the "Acting White" hypothesis) and one that rewards ability (where it is "cool to be smart"). The model shows that either may reduce participation in educational activities when peers can observe participation and performance. We design a field experiment that allows us to test for, and differentiate between, these two

concerns. We implement the experiment in Los Angeles public high schools. We offer students free access to a commercially available SAT prep package that includes an online app, a diagnostic test, and one-on-one tutoring (participating students were told that the package is normally available at a price of over \$100).

The core of our test builds on Bursztyn and Jensen (2015) in varying at the individual level whether students believe the decision to sign up (and here, the diagnostic test score) will potentially be revealed to classmates. If students behave differently when they believe their decision will be revealed to peers, it indicates the presence of peer social concerns. To distinguish between the two proposed mechanisms, we add a lottery and vary the likelihood that students who sign up will win the free SAT package. Assume that with probability p, a student who signs up for the lottery will win the package and get the benefit associated with it. When the decision is public, others will also learn that the student signed up. And if they win, their diagnostic test will also be public, which will reveal their ability to others. If effort is stigmatized, sign-up rates should increase in when the decision is public. In effect, if students face a large social cost just for signing up, they will be more likely to sign up and incur this cost when they have a greater chance of winning the lottery and receiving the benefit of the package. By contrast, if fear of revealing ability is present, then sign-up rates could in fact decrease in p when the sign-up decision is public (as long as that the private benefit of the prep package is not too high). The intuition is that students with low ability can sign up for the package, which allows them to pool with the high ability types, with very little risk of being revealed to be a low ability type (since the diagnostic test score is only revealed if the student wins the package). Thus, when the decision to sign up is public, the differential response to p, whether sign-up increases or decreases in p, allows us to distinguish which of the two motives is present (or, which of the two dominates, since both may apply).

We find that peer pressure reduces take-up of an SAT prep package virtually identically across two very different high school settings. However, the effects arise from very distinct mechanisms: a desire to hide effort in one setting (a large school in a low-income area of Los Angeles with a high share of minority students), and a desire to hide low ability in the other setting (two schools in a higher-income area of Los Angeles). The choice of schools was guided by theory, field work and previous literature, and pre-registered before we ran the experiment: the lower-income school was pre-registered as a likely "smart-to-be-cool" school, and the higher-income ones as likely "cool-to-be-smart" schools.

In the school we pre-registered as a likely "smart-to-be-cool" school, when decisions are public, sign-up rates are indeed higher when p is greater, consistent with a greater concern over revealing effort (sign-up rates are unaffected by p when the decision is private). By contrast, sign-up rates are lower when p is greater in the schools we pre-registered as likely cool-to-be-smart schools when the decision is public, consistent with a greater concern over revealing ability (again, private sign-up rates are unaffected by p). And strikingly, in the cool-to-be-smart schools, when the decision is public the likelihood of sign-up declines

primarily for students with lower grades when the chance of winning the package is high rather than low; this result is further evidence of the proposed mechanism, since such students are most likely to have low scores revealed through the diagnostic test.

Our results highlight that negative peer pressure in important educational choices is more common and widespread than previously considered by documenting its existence in middle-income schools with lower minority shares. Additionally, we document that two very distinct mechanisms are at play in these two settings. We find that while in the low-income school the phenomenon is something akin to the "Acting White" mechanism, in the higher income schools it is our other mechanism, fear of revealing low ability.

By following up with the same students at the end of their academic year, we also find that students in the public treatment in both types of schools, having been less likely to sign up for the SAT prep package, are significantly less likely to have taken the SAT by then. This is further evidence of the stakes associated with their choice in the experiment.

This paper highlights how similar "reduced-form" results can be explained by very different channels in different settings. Considering the potential heterogeneity of environments when designing mechanism experiments linked to theory could have important implications when considering generalizing a set of findings. For example, consider our basic finding of nearly identical effects of public sign-up (pooling the sign-up rates across levels of p) in the two types of schools. In the absence of a more precisely constructed test one might have erroneously inferred that the same mechanism applied in both settings.

Understanding heterogeneity of mechanisms is also important for policy design: the two mechanisms suggest very different implications for a wide range of school policies and practices, such as information and marketing campaigns, grade privacy, honors recognition and programs, paying students for inputs or good grades and whether certain school activities should be mandatory.

I have also studied social interactions in decision-making processes in another area of research: household finance. My paper "Understanding Mechanisms Underlying Peer Effects: Evidence from a Field Experiment on Financial Decisions," (with Florian, Bruno Ferman, and Noam Yuchtman, Econometrica, 2014) uses a high-stakes field experiment conducted in partnership with a financial brokerage in Brazil. This paper disentangles channels through which a person's financial decisions affect those of his/her peers. When someone purchases an asset, his/her peers may want to purchase it as well, both because they learn from his/her choice ("social learning") and because his/her possession of the asset directly affects others' utility of owning the same asset ("social utility"). We randomize whether one member of a peer pair who chose to purchase an asset has that choice implemented, thus randomizing his/her ability to possess the asset. Then, we randomize whether the second member of the pair: 1) receives no information about the first member, or 2) is informed of the first member's desire to purchase the asset and the result of the randomization that determined possession. This allows us to estimate the effects of: (a) learning plus possession, and (b) learning

alone, relative to a no information control group. We find that both "social learning" and "social utility" channels have independent, statistically significant effects on the decision to purchase the asset. We also collect evidence from a follow-up survey which helps interpret our findings. Social learning effects are greatest when the first investor is financially sophisticated, or when the second investor is financially unsophisticated; investors report updating their beliefs about asset quality after learning about their peer's revealed preference; and, they report motivations consistent with "keeping up with the Joneses" when learning about their peer's possession of the asset. These results can help shed light on the mechanisms underlying herding behavior in financial markets and peer effects in consumption and investment decisions. Our findings indicate that social learning from peers matters for financial decisions, especially among unsophisticated investors. Importantly, our finding of significant social utility effects suggests that information provision will not reduce herding as much as one would expect from a model that includes only social learning effects. This paper is the first to use experimental variation in the field to isolate the effect of social learning and the separate effect of social utility.

A long literature has argued that a desire to signal high income or wealth may cause consumers to purchase status goods. The paper "Status Goods: Experimental Evidence from Platinum Credit Cards" (with Bruno Ferman, Stefano Fiorin, Martin Kanz, and Gautam Rao, Quarterly Journal of Economics, 2018) provides field-experimental evidence on status goods. We work with an Indonesian bank that markets "platinum" credit cards to high-income customers. In a first experiment, we show that demand for the platinum card exceeds demand for a nondescript control product with identical benefits, suggesting demand for the pure status aspect of the card. Transaction data reveal that platinum cards are more likely to be used in social contexts (such as in restaurants and bars), consistently with social image motivations. In a second experiment, we provide evidence of positional externalities from the consumption of these status goods. In a control group, current platinum card holders are offered an upgrade to a new, more-expensive but functionally identical, 'diamond card'. In the treatment group, customers receive the same offer, but are additionally informed that the income criterion for their existing platinum card – but not the new diamond card – has been recently reduced, so that some relatively lower-income customers now also qualify for the platinum card. We find that providing this additional information nearly doubles take-up of the new diamond card: lower-income consumers weaken the status signal and thus impose a positional externality on higherincome consumers, even with instrumental benefits held fixed. A final experiment provides suggestive evidence that increasing self-esteem causally reduces demand for status goods, indicating that social image might be a substitute for self image. This paper contributes to the literature on status goods and conspicuous consumption in different ways. First, we provide direct, field experimental evidence on status-signaling in consumption. Second, we provide evidence of the existence of a positional externality from the consumption of a status good. Third, we provide suggestive insights on the role of self-esteem in conspicuous consumption, and more generally on the relationship between self and social image.

In the paper "Moral Incentives in Credit Card Debt Repayment: Evidence from a Field Experiment" (with Stefano Fiorin, Daniel Gottlieb, and Martin Kanz, *Journal of Political Economy*, forthcoming), I extend my work on household and consumer finance. While economists have extensively examined the importance of screening, monitoring and reputational considerations in the analysis of debt collection, little attention has been paid to the role of morality in establishing a norm of debt repayment. We study the role of morality in debt repayment, using a field experiment with the universe of late-paying customers of a large Islamic bank in Indonesia. We find that moral appeals strongly increase credit card repayments. In our main treatment, clients receive a text message stating that "non-repayment of debts by someone who is able to repay is an injustice." This moral appeal decreases the share of delinquent customers by 4.4 percentage points from a baseline of 66 percent, and reduces default among the customers with the highest ex-ante credit risk. Additional treatments help benchmark the effects against those of direct financial incentives, understand the underlying mechanisms, and rule out competing explanations, such as reminder effects, priming religion, signaling the lender's commitment to debt collection, and provision of new information. Beyond highlighting the role of morality in debt-repayment decisions, these results highlight how purely moral appeals can strongly shape important economic behavior.

In the paper "Acting Wife': Marriage Market Incentives and Labor Market Investments" (joint with Thomas Fujiwara and Amanda Pallais (American Economic Review, 2017), we analyze how social norms and social pressure can affect individual labor-market choices. Research from economics and psychology shows that men typically prefer female romantic partners who are less professionally ambitious and successful than they are. Thus, actions that help single women's careers may harm their dating/marriage market prospects. Drawing on observational and field-experimental evidence from an elite MBA program in the US, we study whether single women might avoid career-enhancing actions because they believe these actions signal undesirable traits, like ambition, in the marriage market. While married and unmarried female MBA students perform similarly when their performance is unobserved by classmates (on exams and problem sets), unmarried women have lower participation grades. In a field experiment, single female students report lower desired salaries and willingness to travel and work long hours on a real-stakes placement questionnaire when they expect their classmates to see their preferences. Other groups' responses were unaffected by peer observability. A second experiment indicates the effects are driven by observability by single male peers. We assess whether another difference between single and non-single women can explain why single women, but not women in relationships, downplay their ambition in public. While we cannot rule out that possibility, our results are not easily explained by such a difference. In the primary experiment, differences in single and non-single women's responsiveness to the public treatment are robust to allowing students' responsiveness to vary with covariates. Both groups report similar preferences and self-assessments in the private treatment. They also answer similarly (in public and private) when answers are unlikely to be sanctioned in the marriage market (e.g., when asked to assess their "writing skills").

Similarly, married and unmarried women have similar performance on exams and problem sets: differences only arise for the participation grades and remain unchanged after controlling for covariates. Finally, the supplementary experiment shows that single women's decision to portray themselves as less ambitious in public is driven by the presence of male peers, and especially single male peers. This paper highlights the potential importance of (perceived) social norms in explaining gender gaps.

The body of work described above provides evidence of the importance of social concerns in a variety of important settings. But how far are people willing to go due to this type of concerns? In the working paper "Killer Incentives: Relative Position, Performance and Risk-Taking Among German Fighter Pilots, 1939-45" (joint with Philipp Ager, Lukas Leucht, and Hans-Joachim Voth, 2018), we examine the effects of public recognition on the performance and risk-taking among fighter pilots, using newly-collected data on death rates and victory claims of more than 5,000 German pilots during World War II. To identify effects, we focus on the risk-taking and performance of individual pilots whose *former* peer (a pilot who used to fly in the same squadron in the past) is recognized. We find large increases in both death and victory rates during the month of a peer's public recognition. This effect holds true even while controlling for the recognition of other, unconnected pilots. The strength of this spillover depends on the intensity of prior interactions and social distance. We also provide evidence suggesting that the effects are not driven by correlated shocks, social learning, or learning about one's own ability. Our results suggest that an intrinsic concern about relative standing, beyond instrumental consequences associated with public recognition, was a prime motivating force. This paper contributes to my research agenda by showing that social concerns can affect extremely high stakes decisions in a non-experimental setting.

My work on the topic of social image and social pressure led me to be invited to write a review article on the topic, "Social Image and Economic Behavior in the Field: Identifying, Understanding and Shaping Social Pressure" (with Robert Jensen, *Annual Review of Economics*, 2017). In the article, we summarize the existing field-experimental evidence on the topic and discuss fruitful avenues for future related research.

Having produced a number of papers examining the impact of social pressure and social norms, and on identifying underlying mechanisms, the natural next step in my agenda was to understand how social norms can change (or be changed). The paper "From Extreme to Mainstream: How Social Norms Unravel" (with Georgy Egorov and Stefano Fiorin, *Revise and Resubmit* at the *American Economic Review*, 2017) studies how new information about people's private opinions – such as surprising election results – can cause social norms to erode. We build a model of strategic communication between citizens who hold one of two mutually exclusive opinions. In our model, agents communicate their opinions to each other, and senders care about receivers' approval. As a result, senders are more likely to express the more popular opinion while receivers make less inference about senders who state the popular view. We test these predictions using two experiments. In the first experiment (implemented right before and right after the 2016 Presidential

elections), we identify the causal effect of Donald Trump's rise in political popularity on individuals' willingness to publicly express xenophobic views. Participants in the experiment are offered a bonus reward if they authorize researchers to make a donation to an anti-immigration organization on their behalf. Participants who expect their decision to be observed by the surveyor are significantly less likely to accept the offer than those expecting an anonymous choice. Increases in participants' perceptions of Trump's popularity (either through experimental variation or through the "natural experiment" of his victory) eliminate the wedge between private and public behavior. A second experiment uses dictator games to show that participants judge a person less negatively for publicly expressing (but not for privately holding) a political view they disagree with if that person's social environment is one where the majority of people hold that view. This paper serves as "proof of concept" (using online experiments) for the idea that information aggregation can lead to fast changes in social norms. More broadly, the mechanisms we study in this paper might help explain the recent rise in anti-immigrant and anti-minority sentiment in the developed world.

The working paper "Misperceived Social Norms: Female Labor Force Participation in Saudi Arabia" (joint with Alessandra González and David Yanagizawa-Drott) expands on the idea of how misperceived social norms can sustain behavior by fear of stigma, and how information aggregation can quickly correct these misperceptions and lead to fast changes in behavior. Through the custom of guardianship, husbands typically have the final word on their wives' labor supply decisions in Saudi Arabia, a country with very low female labor force participation (FLFP). We provide incentivized evidence (both from an experimental sample in Riyadh and from a larger, national sample) that the vast majority of young married men in Saudi Arabia privately support FLFP outside of home from a normative perspective, while they substantially underestimate the level of support for FLFP by other similar men – even men from their same social setting, such as their neighbors. We then show that randomly correcting these beliefs about others increases married men's willingness to let their wives join the labor force (as measured by their costly sign-up for a job-matching service for their wives). Finally, we find that this decision maps onto real outcomes: four months after the main intervention, the wives of men in our original sample whose beliefs about acceptability of FLFP were corrected are more likely to have applied and interviewed for a job outside of home. We also provide experimental evidence (by using different methods of opinion elicitation, providing different degrees of plausible deniability) that social desirability bias/experimenter demand effects are not a driver of the misperception finding in the main experiment. Going beyond the national survey, we provide additional evidence of the substantial degree of support for FLFP outside by married Saudi men, by analyzing data from the ArabBarometer survey conducted in 2010-11. Together, the evidence in this paper indicates a potentially important source of labor market frictions, where job search is underprovided due to misperceived social norms. These results might help us understand the role that social norms play in constraining female labor force participation in Saudi Arabia, but also how these constraints might be lifted by the simple provision of information. Active information provision might be particularly important in less

democratic societies, where the availability of other natural aggregators of information (such as elections, referenda and even opinion polls) is more limited.

Another broad field of research interest is political economy. In addition to my work analyzing the importance of social influence in shaping decision-making, I have examined the drivers of behavior when social influence is removed. In the working paper "Political Identity: Experimental Evidence on Anti-Americanism in Pakistan" (with Michael Callen, Bruno Ferman, Syed Ali Hasanain, and Noam Yuchtman, 2017), we attempt to identify the role of intrinsic, ideological motivation in political behavior, disentangling it from agents' consequential aims and social concerns. We develop and implement an experimental methodology isolating Pakistani men's intrinsic motives for expressing anti-American ideology in a context with clearly-specified financial costs, but negligible other consequential or social considerations. Following a survey, we offer subjects a bonus payment. One-quarter of subjects forgo around one-fifth of a day's wage to avoid anonymously checking a box indicating gratitude toward the U.S. government, revealing anti-Americanism. We randomize the cost of not checking the box and find that around 10% of subjects are willing to forgo a full day's wage payment from the U.S. government, thus indicating that even among those with strongly-held anti-American views, there is a downward-sloping demand curve for ideological behavior. To get a better understanding of the role of social pressure in shaping political expression in our setting, we also randomize participants' expectation of privacy associated with their decision. When decisions are expected to be public, the rejection rate of U.S. payment surprisingly falls: this suggests that incentives to conform to a moderate, majoritarian view might dominate the pressure from those with strongly held views. A second experiment correlates rejection of the U.S. payment with membership in Pakistan's major anti-American political party. These results contribute to our understanding of an important ideological current in a pivotal part of the world, suggesting that even individuals with strongly held views might suppress those views, depending on the economic cost of expression, and on the social environment in which expression occurs.

At the intersection of my interests in education and political economy is my article "Poverty and the Political Economy of Public Education Spending: Evidence from Brazil" (Journal of the European Economic Association, 2016). There, I provide an alternative to the longstanding hypothesis that elite capture of democratic institutions results in low levels of education in low-income democracies. Motivated by new cross-country facts and evidence from Brazilian municipalities, I hypothesize that many democratic developing countries might have low levels of public education spending because poor decisive voters prefer that the government allocates resources elsewhere. In particular, I argue that low-income voters could instead favor redistributive spending increasing their incomes in the short run, such as cash transfers. I then implement two novel experiments in Brazil, testing the political economy implications of my argument, and providing revealed-preference evidence of my proposed mechanism. The results of this paper indicate that there could be a low-education trap in democratic countries in which the median voter is relatively poor.

Also related to political economy, but also with a bearing on marketing, is my paper "A Tear in the Iron Curtain: The Impact of Western Television on Consumption Behavior," (with Davide Cantoni, *Review of Economics and Statistics*, 2016). In this paper, my coauthor and I focus on a "natural experiment" in former East Germany, where differential access to Western television was determined by geographic features. We study the effect of exposure to Western television on private consumption choices. Using data collected after the transition to a market economy, we find no evidence of a significant impact of previous exposure to Western television on aggregate consumption levels. However, we find that exposure to Western broadcasts affects the composition of consumption, biasing choices in favor of categories of goods with high intensity of pre-reunification advertisement. Furthermore, the effects vanish by 1998. The paper's unique setting provides novel insights on the total effects of advertising on consumer behavior, as opposed to marginal effects. Also, our paper provides an empirical setting that allows for a well-identified analysis of the causal impact of long-term exposure to advertising on consumption behavior, thus dealing with the common reverse causality problem in the literature.

A central question in politics is understanding why people vote. Models of voting, including the canonical rational voter model, predict that voters are more likely to turn out when they anticipate a closer election. Yet, evidence of a causal effect of anticipated election closeness on voter turnout is limited. In the working paper "Polls, the Press, and Political Participation: The Effects of Anticipated Election Closeness on Voter Turnout" (with Davide Cantoni, Patricia Funk, and Noam Yuchtman, 2018), we exploit naturally occurring variation in the existence, closeness, and dissemination of pre-election polls to identify a causal effect of anticipated election closeness on voter turnout in Swiss referenda. Closer elections are associated with greater turnout only when polls exist. Examining within-election variation in newspaper reporting on polls across cantons, we find that close polls increase turnout significantly more where newspapers report on them most. This holds examining only "incidental" exposure to coverage by periodicals whose largest audience is elsewhere. The introduction of polls had larger effects in politically unrepresentative municipalities, where locally available information differs most from national polls. Our analysis points to an important policy implication: the regulation of polls' conduct and their dissemination can have important consequences for election outcomes.

A final area of research, on which I have worked in the past, focuses on a more macro approach to development, studying economic growth theory, and especially, the interplay of growth and environmental policy. I first coauthored, with Philippe Aghion and Peter Howitt, a chapter from their graduate textbook *The Economics of Growth* (2009, MIT Press), titled "Preserving the Environment." In that chapter, we develop a new, simple framework introducing directed technical change in a model of growth with

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<sup>&</sup>lt;sup>1</sup> I also coauthored (with David Hémous, Dorothée Rouzet, Thomas Sampson, and Ruchir Agarwal) the Solutions Manual to that textbook.

Change" (with Daron Acemoglu, Philippe Aghion, and David Hemous, *American Economic Review*, 2012). There, we develop a two-sector growth model of endogenous and directed technical change to study the response of different types of technologies to environmental policies. This theoretical paper provides new insights on formulating environmental policy: (i) delaying governmental intervention is costly, as it later necessitates a longer transition phase with slow growth; (ii) when inputs are sufficiently substitutable, sustainable growth can be achieved with *temporary* taxes/subsidies that redirect innovation toward clean inputs; (iii) optimal policy involves both "carbon taxes" and research subsidies, avoiding excessive use of carbon taxes. This article is rapidly becoming an influential piece, with over 1,300 Google citations as of August 2018.

In a nutshell, my work generally uses field experiments and novel identification strategies to understand and disentangle mechanisms involved in major decision-making processes, particularly in settings where social interactions play an important role.

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