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Personal Information:
Date of Birth: June 9th, 1988
Citizenship: Chilean
Visa: J1

Undergraduate Studies:

Undergraduate Degree, Industrial Engineering, University of Chile, Highest Distinction, 2013
B., Engineering Science in Industrial Engineering, University of Chile, Highest Distinction, 2011

Masters Level Work:
M. A., Economics, University of Pennsylvania, 2018
M., Public Policies, University of Chile, Highest Distinction, 2013

Graduate Studies:
University of Pennsylvania, 2015 to present
Thesis Title: "*Essays on Empirical Market Design in Higher Education*"
Expected Completion Date: May 2021

Thesis Committee and References:
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Teaching and Research Fields:
   Microeconomics, Market Design, Education, and Labor Economics

Teaching Experience:
   Fall, 2016, Introduction to Economics, University of Pennsylvania, Teaching Assistant
   for Professor Anne Duchene
   Spring, 2017, Introduction to Economics, University of Pennsylvania, Teaching
   Assistant for Professor Rebecca Stein
   Fall, 2018, Intermediate level Microeconomics, University of Pennsylvania, Teaching
   Assistant for Professor Rakesh Vohra
   Spring, 2020, Industrial Organization, University of Pennsylvania, Teaching Assistant
   for Professor John Lazarev

Research Experience and Other Employment:
   2017   University of Pennsylvania, R.A. for Professors Hanming Fang and Andrew Shephard
   2018   University of Pennsylvania, R.A. for Professors Hanming Fang and Andrew Shephard
   2018   University of Pennsylvania, R.A. for Professor Rakesh Vohra
   2019   University of Pennsylvania, R.A. for Professors Juan Pablo Atal and Rakesh Vohra

Professional Activities
Presentations: University of Chile, Santiago, Chile (2020)
                 North American Summer Meeting / Econometric Society, Seattle, USA (2019)
                 15th Workshop on Matching Practices in Europe, Mannheim, Germany (2018)
Refereeing: International Economic Review, Higher Education Policy
Professional: Startup - Consultancy Company, *TwoMatch* Consulting (Design of matching algorithms)
                 2014-2015: Chilean College Board

Honors, Scholarships, and Fellowships:
   2020-2021   Maloof Family - Dissertation Fellowship in Economics
   2018-2019   Rodin Graduate Fellowship
   2017   Joel Popkin Award, Graduate Student Teaching Prize in Economics, Department of Economics,
                  University of Pennsylvania
   2015-2020   University of Pennsylvania Fellowship Department of Economics, University of
                  Pennsylvania
   2014   Eugenio Lahera Prize: Best Thesis in Public Policies, University of Chile

Publications:

"Hunter-gatherers maintain assortativity in cooperation despite high-levels of residential change and mixing",
with K. Smith, I. Mabulla, C. Apicella, in Current Biology 28 (19), 3152-3157, 2018

"Effect of Including High-School Grades Rank in the Admission Process to Chilean Universities", with A. Mizala
and I. Ríos, in Pensamiento Educativo, 52 (1), 95–118, 2015.

Research Papers:

Job Market Paper:
"Dynamic College Admissions and the Determinants of Students' College Retention" (with I. Rios)
We analyze the determinants of students' college retention in the context of dynamic centralized assignment mechanisms, where students can learn about their preferences and abilities over time and can re-apply to the system. We show that the most common assignment mechanism, the Deferred Acceptance (DA) algorithm, can result in significant inefficiencies as it fails to elicit the intensity of students' preferences. Using data from Chile, we document these inefficiencies, and we show that not being assigned to ones' top-reported preference has a positive causal effect on the probability of (i) reapplying to the centralized system, (ii) switching one's major/college, and (iii) delaying college graduation. Moreover, we find that a significant fraction of students change their preferences over time, which increases switchings and delay graduations, and we also observe that these switching

and dropout decisions vary depending on students characteristics including gender and level of income. Based on these facts, we build and estimate a structural model of students' college progression in the presence of a centralized admission system, allowing students to learn their match-quality over time. We use the estimated model to disentangle how much of students' switching behavior is due to initial mismatches as opposed to learning, and we also analyze the impact of changing the assignment mechanism and the re-application rules on the efficiency of the college admissions' system. Our counterfactual results show that policies that provide score bonuses which elicit the intensity on students' preferences can significantly decrease switchings, dropouts, and increase the overall welfare of students.

"Improving the Chilean College Admissions System" (with R. Cominetti, I. Rios and G. Parra), in Operations Research (R & R Minor revisions). First place, Doing Good with Good OR - Student Paper Competition (2018)
In this paper we present the design and implementation of a new system to solve the Chilean college admissions problem. We develop an algorithm that obtains all stable allocations when preferences are not strict and when all tied students in the last seat of a program (if any) must be allocated, and we used this algorithm to determine which mechanism was used to perform the allocation. In addition, we propose a new method to incorporate the affirmative action that is part of the system and correct the inefficiencies that arise from having double-assigned students. By unifying the regular admission with the affirmative action, we have improved the allocation of approximately 3% of students every year since 2016. From a theoretical standpoint, we introduce a new concept of stability and we show that some desired properties, such as strategy-proofness and monotonicity, cannot be guaranteed under flexible quotas. Nevertheless, we show that the mechanism is strategy-proof in the large, and therefore truthful reporting is approximately optimal.

"Do "Short-List" Students Report Truthfully? Strategic Behavior in the Chilean College Admissions Problem" (with I. Rios)
We analyze the application process in the Chilean College Admissions problem. Students can submit up to 10 preferences, but most students do not fill their entire application list ("short-list"). Even though students face no incentives to misreport, we find evidence of strategic behavior as students tend to omit programs for which their admission probabilities are too low. To rationalize this behavior, we construct a portfolio problem where students maximize their expected utility given their preferences and beliefs over admission probabilities. We adapt the estimation procedure proposed by Agarwal and Somaini (2018) to solve a large portfolio problem. To simplify this task, we show that it is sufficient to compare a ROL with only a subset of ROLs ("one-shot swaps") to ensure its optimality without running into the curse of dimensionality. To better identify the model, we exploit a unique exogenous variation on the admission weights over time. We find that assuming truth-telling leads to biased results. Specifically, when students only include programs if it is strictly profitable to do so, assuming truth-telling underestimates how preferred selective programs are and overstates the value of being unassigned and the degree of preference heterogeneity in the system. Ignoring the constraint on the length of the list can also result in biased estimates, even if the proportion of constrained ROLs is relatively small. Our estimation results strongly suggest that "short-list" students should not be interpreted as truth-tellers, even in a seemingly strategy-proof environment. Finally, we apply our estimation method to estimate students' preferences for programs and majors in Chile and find strong differences in preferences regarding students' gender and scores.

"College Admissions Problem with Ties and Flexible Quotas" (with R. Cominetti, I. Ríos and G. Parra)
We study an extension of the classical college admission problem where applicants have strict preferences, but careers may include ties in their preference lists. We present an algorithm which enables us to find stable assignments without breaking ties rules but considering flexible quotas. We investigate the properties of this algorithm -- stability, optimality -- and we show that the resulting algorithm is neither monotone nor strategy-proof. The mechanism is used to solve real instances of the Chilean college admission problem. Among our results, we show that the welfare of students is increased if flexible quotas and a student-optimal assignment are combined. Finally, we argue why such assignment may be desirable in the Chilean context.

Research Paper(s) in Progress

"The effects of Automation on the U.S Labor Market, under the Affordable Care Act" (with H. Fang and A. Shephard)

"Hybrid Dutch auctions and Toxic bonds", (with T. Mylovanov, and R. Vohra)

"Mistakes in College Admissions" (with M. Martinez, C. Neilson, and I. Rios)

Languages: Spanish (Native) and English (Fluent)

Computational Skills: R, Rcpp, C++, Python, SQL, and Stata