Si Zuo

PhD Candidate in Economics
SC Johnson Graduate School of Management & Economics Department
Cornell University
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Education

Cornell University, Ithaca, NY

PhD in Economics, SC Johnson Graduate School of Management & Economics Department, September 2019 - Present

Hong Kong University of Science and Technology, Hong Kong

Master of Science, Economics, September 2018 - June 2019

Sun Yat-sen University, Guangzhou, China

Bachelor of Science, Economics, October 2014 - June 2018

Nagoya University, Nagoya, Japan

Exchange Student, October 2016 - February 2017

Research Interest

industrial organization, quantitative marketing, platform, recommendation systems, rating algorithms.

Methodology: Causal inference, structural model, machine learning, reinforcement learning, game theory.

Working Papers

1. Coarse Ratings on Online Platforms. JMP.

Abstract: Ratings are widely used on online platforms, but there is huge variation in the coarseness levels of ratings displayed on platforms. For example, Airbnb displays ratings to two decimal places (granular rating), while Amazon only displays half stars (coarse rating). A natural question is: is there an optimal coarseness level of ratings on a platform? In this project, I try to answer this question using both synthetic simulations and observational data. In the first half of the project, I develop a dynamic model to illustrate the fairness-efficiency trade-off behind coarse ratings: coarse ratings could improve fairness on the platform by helping entrants stay longer, thus improving the quality of products available on the platform. On the other hand, coarse ratings hide information from consumers, naturally leading to an information loss. I show that when the fairness force dominates, coarse ratings improve total welfare and platform revenue. In addition, my results suggest there is an inverse U-shaped relation between rating coarseness level and platform revenue. I find markets with more firms or higher quality dispersion require more granular rating systems.

In the second half of the project, I use Airbnb 2015-2019 NYC data for the counterfactual simulation exercise to determine the optimal coarseness of ratings on Airbnb. I find that Airbnb's platform revenue could increase by 4.0% if Airbnb changes from the current 2-decimal place rating (4.83, 4.93) to a one-decimal place rating system (4.8, 4.9). My project provides new insights into platform rating design and offers guidance on how platforms should choose the optimal coarseness level for ratings.

2. Price Signaling and Reputation Building: Evidence from a Service Platform, with Yangguang Huang (HKUST) and Chenyang Li (HKUST Guangzhou). Covered by South China Morning Post.

Abstract: To build a reputation on online platforms, new firms need to accumulate reviews through sales and consider the corresponding pricing strategy. We construct a dynamic model with both price signaling and a review-based reputation system. A high-quality firm can signal its unobserved quality by setting a lower introductory price than that of a low-quality firm because the high-quality firm benefits more from accumulating reviews in early periods. Using data from Zaihang, a service platform, we find empirical evidence that experts with high unobserved ability indeed adopt low introductory prices. We use an expert's performance on another platform as an instrument for the expert's ability to provide evidence for the causal relationship. The price and sales dynamics in the data are also consistent with the model predictions. The platform can accelerate quality revelation by facilitating price signaling. To do so, platforms could make price comparison easier and provide training to new firms about signaling.

3. Personalized Algorithms and the Virtue of Learning Things the Hard Way, with Omid Rafieian (Cornell Tech).

Abstract: Personalized recommendation systems are now an integral part of the digital ecosystem. However, users' increased dependence on these personalized algorithms has heightened concerns among consumer protection advocates and regulators. Past studies have documented various threats personalization algorithms pose to different aspects of consumer welfare, through violating consumer privacy, unfair allocation of resources, or creating filter bubbles that can lead to increased political polarization. In this work, we bring a consumer learning perspective to this problem and examine whether personalized recommendation systems hinder consumers' independent decision-making ability, an important construct given the growing fear of adversarial AI. We develop a utility framework where consumers learn their preference parameters through experience to examine the effect of personalized algorithms on the learning process. We establish regret bounds for different types of consumers based on their dependence on the personalized algorithm. We then run a series of calibrated simulations and show that although personalized algorithms increase consumer welfare for consumers who rely more on personalized recommendations by offering better recommendations, these consumers do not sufficiently learn their own preference parameters and make worse decisions in the absence of recommendation systems. Inspired by the trade-off between consumer learning and welfare, we introduce the notion of counterfactual regret, which is the regret incurred by the consumer when the personalized algorithm is unavailable. Finally, we examine a variety of consumer protection policies that aim to find a balance between these two outcomes and find policies that can achieve good welfare and learning outcomes.

4. **Stores Going Online: Market Expansion or Self Cannibalization?**, with Yangguang Huang and Chenyang Li.

Abstract: With the continual growth of e-commerce, many brands have opened up online sales channel alongside with their traditional brick-and-mortar (B&M) stores. Consumers usually incur lower shopping costs from purchasing online, so the presence of an online store tend to cannibalize sales of the corresponding B&M store. However, online sales may expand the market for the B&M store by increasing consumer awareness of the brand and transmitting product information. We use a unique dataset of 308 B&M stores matched with their online stores on Taobao to investigate the two counterveiling effects. We utilize rainy days and Covid outbreaks as offline-exclusive demand shocks to identify the (negative) cannibalization effect of online sales on B&M stores. We use Taobao live streaming and Double-11 shopping festival as online-exclusive demand shocks to identify the (positive) informative effect. Our findings reveal that categories of home, clothing, cosmetics, and jewelry suffer the most from the opening of online stores, while amusement and personal care stores are not affected. We also find that local stores experience both large

negative and small positive effects. Based on survey data, we find the discounted price difference, online store quality and consumer online shopping habits are the main mechanisms behind these heterogeneous results. Our study unveil the complex relationship between online and offline sales and offer insights into the strategies and operations of store managers and shopping malls in the digital age.

Fellowships, Honors and Grants

Oct 2023 & June 2023 & Mar 2021, Strategy and Business Economics Small Grant (X 3), $5,000, $4,100, $3,000, SC Johnson College of Business, Cornell University

July 2023, Hong Kong Research Grants Council, General Research Fund, " Structural Analysis of Stores Going Online and Shopping Malls' Responses," Project No. 16503523, $59,000, Collaborator

July 2023, Funded Attendee, NBER's Innovation Research Boot Camp

July 2022, Emerging Market Theme Grants, $1,500, SC Johnson College of Business, Cornell University

Sept 2020, Passed with Distinction First Year PhD Sequence, Economics Department, Cornell University

2019-2024, Johnson Fellowship, Cornell University

2016-2017, JASSO Scholarship, Ministry of Education, Japan

Conference Talks and Invited Talks

2023, Asia-Pacific Industrial Organization Conference (HKUST); Econometrics Society Asian Meeting (Beijing); CES Annual Conference (Wuhan); Fudan University (Shanghai); Marketing Science Conference (Miami); Eastern Economic Association Annual Meeting (New York); Innovation, Entrepreneurship, and Technology Workshop (Cornell);

2022, National Association for Business Economics: Tech Economics Conference (Seattle, Platform Session Chair); Marketing Brown Bag Seminar (Cornell); International Industrial Organization Conference (Boston)

2021, Asia-Pacific Industrial Organization Conference (NUS, Virtual); Emerging Markets Research Day (Cornell)

2019, Asia Meeting of the Econometric Society (Xiamen University, China)

Teaching Experience

Instructor

Industrial Organization, Consulting and Business Strategy Winter 2024, Fall 2022

MBA Elective Course, Course Designer and Lead Instructor, evaluation 4.5/5, 4.4/5

SC Johnson Graduate School of Management, Cornell University

Marketing Management Fall 2023

Undergraduate Business Minor, Lead Instructor, evaluation 4.7/5

SC Johnson Graduate School of Management, Cornell University

Teaching Assistant

AI for Marketing Strategy (MBA Elective Course, with sessions) Spring 2023

with Prof. Emaad Manzoor, Johnson Graduate School of Management, Cornell University

Data Analysis and Modeling (MBA Core Course, with sessions) Summer 2022
with Prof. Omid Rafieian, Johnson Graduate School of Management, Cornell University
Applied Microeconomics II: Game Theory (PhD Core Course) Spring 2022
with Prof. Michael Waldman, Dyson School of Applied Economics and Management, Cornell University
Microeconomics Theory I (PhD Core Course, with sessions) Fall 2021
with Prof. David Easley, Economics Department, Cornell University
Microeconomics for Management (MBA Core Course) Fall 2020 & Summer 2021
with Prof. Yi Chen & Prof. Michael Waldman, Johnson Graduate School of Management, Cornell University
Strategy (Cornell-Tsinghua Finance MBA Core Course) Winter 2021 & Spring 2021
with Prof. Thomas Jungbauer, Johnson Graduate School of Management, Cornell University

Guest Lecturer

Conversations in Business Analytics (MS in Business Analytics Core Course) Oct. 2022
Johnson Graduate School of Management, Cornell University

Research Assistant Experience

Spring 2023, Research Assistant for Prof. Benjamin Leyden, Cornell University
Fall 2022, Research Assistant for Prof. Michael Waldman, Cornell University
Spring 2022, Research Assistant for Prof. Yi Chen, Cornell University
Fall 2021- Winter 2022, Research Assistant for Profs. Shanjun Li and Panle Jia Barwick, Cornell University
Feb 2021-May 2021, June 2020, Research Assistant for Prof. Thomas Jungbauer, Cornell University
July 2020- Dec 2020, Research Assistant for Prof. Marcel Preuss, Cornell University
Sep 2018- June 2019, Research Assistant for Prof. Yuk Fai Fong, Hong Kong University of Science and Technology

Referee Service

Journal of Industrial Economics

Professional Experience

Fall 2022- Spring 2023, PhD Liaison for Strategy Business Economics Seminars, SC Johnson College of Business, Cornell University
Fall 2021-Spring 2022, Digitization Reading Group Organizer, Cornell University
Fall 2021-Spring 2022, Economics Graduate Students Works in Progress Seminar Organizer, Cornell University
Spring 2021-Winter 2022, IO Student Reading Group Organizer, Cornell University

Language

Chinese (Native), English (Proficient), Japanese (Proficient, JLPT N1 Highest Level) , French (Intermediate)

Skills

Stata, R, Python, Matlab, Stan

References

Michael Waldman (Chair)
Charles H. Dyson Professor of Management and Professor of Economics
Cornell SC Johnson College of Business
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