Mengshan Zhao

Curriculum Vitae – September 19, 2025

Address: 2020 NE Wilson Rd (Campus), Pullman, WA 99163
Email: mengshan.zhao@wsu.edu
Phone: (608) 334-7814
Website: www.mengshanzhao.com

EDUCATION

Ph.D., Agricultural Economics, Washington State University, 2021–Present (expected 2026)
M.S., Agricultural and Applied Economics, University of Wisconsin–Madison, 2019–2021
B.B.A. (Hons.), Applied Economics, The Chinese University of Hong Kong, Shenzhen, 2015–2019
Visiting Programs: University of California, Irvine; London School of Economics and Political Science

FIELD

Health, development and environmental economics

RESEARCH

Job Market Paper

When the Worst Compete: Strategic Responses to Environmental Protection Interviews in China

Draft Available

This paper explores the dynamic incentives embedded in ranking-based environmental governance, investigating how governments strategically respond to competitive performance evaluations. Using China's Environmental Protection Interview (EPI): a high-profile, ranking-driven policy targeting underperforming cities as an empirical case, I leverage high-frequency air-quality data and a Callaway–Sant'Anna difference-in-differences framework to analyze behavior under pressure. Contrary to existing literature, which typically estimates modest pollution reductions for formally sanctioned cities, my analysis shows that cities at risk of being treated reduce PM2.5 by approximately 12.6 $\mu g/m^3$, nearly three times of prior estimates when facing the risk of evaluation sanctions. These reductions show clear seasonality: peaking at 21.7 $\mu g/m^3$ in December and weakening midyear, consistent with short-term strategic abatement around evaluation windows. The policy also generates measurable healthcare cost savings during the evaluation periods, though no significant changes are observed in the number of patients in either urban or rural areas. Political factors shape these responses: cities with extensive elite ties intensify short term reductions around evaluation periods, whereas those near capital region oversight sustain steadier improvements throughout the year. Importantly, political connections shift effort across the calendar without increasing the total annual effect. A tournament model explains why elite ties and geographic adjacency generate different patterns by separating rank loss costs from pollution damage costs. Taken together, the findings highlight both the advantages and drawbacks of rank-ordered policy design and underscore the importance of aligning short-term incentives with long-term public-health goals.

Working Papers

Family Plans and Planning Policy: The Role of Women's Human Capital in Shaping China's Fertility Trends

with Benjamin Cowan, draft available upon request

This paper investigates the impact of women's higher education on fertility decisions in China, focusing on cohorts subject to the One-Child and Second-Child Policies. Using provincial per capita college access at age 17 as an instrument, we isolate exogenous variation in educational attainment stemming from centrally managed quota systems for university enrollment. Drawing on the 2020 China Family Panel Survey, our 2SLS estimates indicate that each additional year of education delays the age at first birth by 0.31 years and reduces total fertility by 0.085 children. We find no significant effect on childbearing within policy limits, but a sizable and significant decline in higher-order births that would violate family planning regulations. This pattern suggests that the channel through which education affects fertility operates primarily via increased compliance with population control policies, rather than shifts in preferences or biological constraints. Further analysis reveals that formal employment and institutional penalties—rather than monetary fines—are likely to mediate this compliance effect. Through this study, we contribute to the broader discourse on the socio-economic factors shaping reproductive behaviors in contemporary China, emphasizing the pivotal role of education in aligning individual fertility choices with national policy objectives.

Assessing the Impact of Organic Farm Training on Crop Productivity by Gender

with Shanthi Manian, Gregmar I. Galinato, Seollee Park, Suzette P. Galinato, Christian Paul L. Fang, Amelia Bello, Shaira Mae C. Calayugan, and Lorna Sister, draft currently under review

Agricultural technology interventions can reshape the gendered division of labor within farm households, yet whether these shifts improve or worsen productivity remains poorly understood. We conduct a randomized controlled trial among 600 vegetable farming households in the Philippines to evaluate the causal impact of organic vegetable technology adoption on crop productivity and intrahousehold labor allocation. Training and starter kits significantly increased organic technology adoption in both the short and medium run. In particular, the treatment increased adoption of labor-intensive homemade fertilizers and pesticides among poor households. We do not find any significant treatment effect on the aggregate number of workers or person-days. However, aggregate effects mask wealth-dependent heterogeneity in female labor. Among poor households, organic farming increased overall female labor, driven by time dedicated to fertilizer and pesticide application. In contrast, wealthier households maintained aggregate female labor but reallocated it away from these stages, suggesting they purchased market-ready organic inputs. While we find no overall effects on crop revenue or farm profitability, production function estimates indicate that treatment reduced the marginal product of female labor for profit—with suggestive evidence that this decline is concentrated among poorer households. These findings highlight how agricultural technology adoption can widen the existing gender productivity gap among poorer households by changing production processes.

Accuracy Can Reward Collapse: A Field Audit of LLM Survey Respondents

Draft Available

LLM respondent simulation is increasingly used to approximate human survey responses, but average accuracy can be misleading when a simulator collapses onto the cohort's most common direction of change. We audit this failure mode in a six-month Nigerian caregiver field trial, predicting held-out mental health measures (PHQ-9, GAD-7, and WHODAS-12) for 642 caregivers from baseline and program-period records. The central result is negative but actionable: respondent simulation has no

single validity score. A direct structured-context LLM and a supervised RandomForest achieve the lowest item-level errors on several outcomes, yet both nearly collapse PHQ-9 change to "everyone improves": 99.8% and 97% predicted improvement versus 75% observed. Against these two regimes we introduce Layered Respondent Simulation (LRS), an explicit local population-prior simulator, and evaluate all three on five fidelity axes: raw MAE, mean-matched MAE, variance preservation, severe-tail recall, and individual residual alignment, alongside item-covariance diagnostics. Direct prompting best preserves residual ranking; supervised ML best preserves mean-matched accuracy and item covariance; LRS best preserves marginal spread and is the only regime that produces categorical clinical-cutoff positives on weak-anchor outcomes. The split is explained by baseline anchoring: interpolation wins when per-item anchors exist, while explicit population-prior design is needed when anchors are weak or absent. A distribution-only World Values Survey check on Nigerian women (300 personas, five items) supports the same pattern out-of-cohort: narrative-conditioned personas improve mean, severe-prevalence, and variance calibration, with item-level gains uneven.

Work in Progress

Addressing Maternal Mental Health and Child Undernutrition in Nigeria through Psychological Support

with Seollee Park and Jennifer Ostrowski

Maternal mental health is a serious yet neglected challenge in developing countries, with depression rates ranging from 15–57% globally. Poor maternal mental health undermines childcare, feeding practices, and women's empowerment, with cascading effects on children's nutrition and development. This study investigates whether integrating psychological support into nutrition programs can improve both maternal and child outcomes. We implement a randomized controlled trial in Gombe State, Nigeria, where mothers of acutely malnourished children under five who exhibit at least mild depressive symptoms are offered Problem Management Plus (PM+), a WHO-designed, low-intensity psychological intervention focused on stress management and problem-solving skills. The intervention is delivered alongside the government's community-based management of acute malnutrition (CMAM) program. We measure impacts across six domains: maternal psychosocial wellbeing, caregiving, child feeding, child development, child nutrition, and child health. To probe mechanisms, we also assess changes in women's empowerment, decision-making power, cognitive and socio-emotional skills, and intra-household dynamics including intimate partner violence. To date, we have screened over 5,400 caregivers, enrolling 754 caregiver–child pair. Baseline surveys are complete, and endline data collection has been completed for 562 of the enrolled caregiver. The project provides timely evidence on whether scaling psychological support through existing nutrition platforms can improve maternal and child health at low cost in resource-constrained settings.

Organic Farming Training, Child Nutrition, and Intra-Household Mechanisms in Rural Philippines

with Shanthi Manian, Gregmar I. Galinato, Seollee Park, Suzette P. Galinato, Christian Paul L. Fang, Amelia Bello, Shaira Mae C. Calayugan, and Lorna Sister

This project is embedded within a randomized controlled trial (RCT) in rural Philippines. We examine the impacts of organic farming technology training on child anthropometric and nutritional outcomes, focusing on the causal pathways through which such effects may arise. Using experimental household decision-making games, we construct an intra-household bargaining power index and analyze shifts in expenditures and time allocation as potential mechanisms linking training adoption to improvements in child well-being. Our results indicate that, while the intervention shows no significant effect on child outcomes for intention-to-treat (ITT) effect, local average treatment effect

(LATE) estimates suggest meaningful impacts among households that adopt the technologies.

Other Publications and Projects

Role of Public Sentiment in Evaluating Lockdown Effects on Mobility: An Application of the Natural Language Processing Method
with Xiaorui Qiu, Qinan Lu, Liufang Su, and Guanming Shi; under review at Economic Modelling

This study uses county-level COVID-19 tweet sentiment (March–April 2020) to evaluate lockdown effects on mobility. Employing a Regression Discontinuity in Time model, we find lockdowns reduced mobility by 5.5% for about 10 days, with neutral-tone sentiment exerting the strongest negative impact on mobility indices. Results highlight the role of public sentiment in evaluating policy effects.

The Impacts of COVID-19 on Containerized Agricultural Exports
with Jake Wagner, Eric Jessup, and Ben Kenner

Analyzes the disruptions of COVID-19 on U.S. agricultural container exports, focusing on logistics bottlenecks and supply chain resilience.

Optimal Pricing Policies for Campus Parking
with Jake Wagner and David Moore; draft available upon request

Explores efficient pricing structures for campus parking to balance demand management, revenue generation, and equity concerns.

RESEARCH ASSISTANT EXPERIENCE

Research Assistant, Prof. Seollee Park, Washington State University *2023–Present*

Research Assistant, Prof. Jake Wagner, Washington State University *2022*

TEACHING EXPERIENCE

Instructor, Washington State University *Jan 2025 – Jan 2026*

ECONS 320: Money and Banking (Online) — Course evaluations: 4.5/5

ECONS 323: Labor Economics (Online) — Course evaluations: 4.5/5

ECONS 335: Business Finance (Online) — Ongoing

ECONS 426: Transportation Economics and Supply Chain Analysis (Online) — Ongoing

Teaching Assistant, Washington State University *Sep 2021 – Dec 2021*

ECONS 101: Fundamentals of Microeconomics

GRANT

Addressing Maternal Mental Health and Child Undernutrition in Nigeria through Psychological Support 2023–2025

CEGA, UC Berkeley, $75,000. Lead PI: Seollee Park; Role: *Additional Investigator.*

CONFERENCE PRESENTATIONS

Competing for Clean Air: Dynamic Incentives in China's Environmental Protection Interviews

2025: Association of Environmental and Resource Economists (AERE, May), Western Economic Association International (WEAI, June), WSU Student Seminar (Nov), selected for presentation at 2025 AAEA Annual Meeting

2024: Northwest Development Workshop (June 2024)

Optimal Pricing Policies for Campus Parking

Region 10 Transportation Conference (Oct 2022)

AWARDS & FELLOWSHIPS

Felloni, Giorgio, and Luisa SES Fellowship, Washington State University

PROFESSIONAL SERVICE

Section Chair - AERE, WEAI 2025

Volunteer, Social Platform Team — Committee on Women in Agricultural Economics (CWAE)

REFERENCES

Chair: Seollee Park
Assistant Professor
School of Economic Sciences & Paul G. Allen School for Global Health
Washington State University
2020 NE Wilson Rd, Pullman, WA 99163
Email: seollee.park@wsu.edu
Phone: 509-335-8521

Shanthi Manian
Associate Professor
School of Economic Sciences & Paul G. Allen School for Global Health
Washington State University
Pullman, WA 99163
Email: shanthi.manian@wsu.edu
Phone: 509-335-8739

Benjamin Cowan
Professor
School of Economic Sciences
Washington State University
Pullman, WA 99163
Email: ben.cowan@wsu.edu
Phone: 509-335-2184

Gregmar I. Galinato
Professor
School of Economic Sciences
Washington State University
Pullman, WA 99163
Email: ggalinato@wsu.edu
Phone: 509-335-6382