# About

I am a Ph.D. candidate in the Economics Department of the University of Pennsylvania. My research interests include the fields of Education Economics, Development Economics, and Applied Microeconomics.

# Research

## Job Market Paper

**How Child Labor Impacts School Enrollment, Student Effort and Achievement in Mexican Junior High Schools**

Gabrielle Vasey

*Abstract:* When school-age children work, their education must compete for their time and effort, which may result in them dropping out or decreasing their achievement. This paper analyzes how students value labor compared to education, and estimates what student and school characteristics impact the tradeoff students make between spending time learning at school versus earning a wage. Using data from Grade 6 students in Mexico, I develop and estimate a model that incorporates a school choice, a labor decision, an effort decision, and an achievement production function all in one framework. I use this model to estimate counterfactuals including enforcing child labor laws, changing the conditional cash transfer, and changing school characteristics.

## Work in Progress

**The Marginal Returns of Distance Education on Achievement**

Emilio Borghesan, Gabrielle Vasey

*Abstract:* We estimate the marginal effects of attending Mexican telesecondary schools on 7th grade Math and Spanish scores. We find positive treatment effects of telesecondaries on achievement, but these estimates mask considerable heterogeneity. We use nonparametric estimates of the Marginal Treatment Effect to analyze several counterfactual policies, including a school-building program and an expansion of the conditional cash transfer program, Progresa.

**Peer Effects in the Classroom: A Model of Effort Choice and School Choice**

**under the Progresa Program in Mexico**
Alejandro Sanchez Becerra, Petra Todd, Gabrielle Vasey

**Designing More Cost-Effective Trading Markets for Renewable Energy**
Mike Abito, Felipe Flores-Golfin, Arthur van Benthem, Gabrielle Vasey

## Publications

**Additional Navigational Strategies Can Augment Odor-Gated Rheotaxis for Navigation under Conditions of Variable Flow**
Gabrielle Vasey, Ryan Lukeman, Russell C. Wyeth
Integrative and Comparative Biology, 55 (3), 447-460

*Abstract:* The navigation strategies animals use to find sources of odor depend on the olfactory stimuli, the properties of flowing fluids, and the locomotory capabilities of the animal. In high Reynolds number environments, animals typically use odor-gated rheotaxis to find the source of turbulent odor plumes. This strategy succeeds because, although turbulence creates an intermittent chemical cue, the animal follows the (continuous) directional cue created by the flow that is transporting the chemical. However, in nature, animals may lose all contact with an odor plume as variations in the direction of bulk flow cause the plume to be rotated away before the animal reaches the source of the odor. Our goal was to use a mathematical model to test the hypothesis that strategies that augment odor-gated rheotaxis would be beneficial for finding the source of an odor plume in such variable flow. The model links a stochastic variable-direction odor plume with a turbulence-based intermittent chemical signal and four different movement strategies, including: odor-gated rheotaxis alone (as a control), odor-gated rheotaxis augmented by further rheotaxis in the absence of odor, odor- gated rheotaxis augmented by a random walk, and odor-gated rheotaxis augmented by movement actively guided by the heading of the flow when the odor was still present. We found that any of the three augmented strategies could improve on strict odor-gated rheotaxis. Moreover, variations in performance caused the best strategy to depend on the speed of movement of the animal and the magnitude of the variation in flow, and more subtly on the duration over which the augmented strategy was performed. For most combinations of parameters in the model, either augmenting with a random walk or following the last-known heading were the best-performing strategies. Overall, our results suggest that marine animals that rely on odor cues to navigate in turbulent environments may augment odor-gated rheotaxis with additional movements that will increase the probability of finding the sources of odors. Moreover, we believe our approach to modeling odor plumes in variable flows is a

valuable step toward mathematically capturing the key conditions experienced by animals navigating on the basis of odors carried by flows.

# Teaching

## Main Instructor at UPenn

(Undergraduate Courses)
Introductory Economics (2017, 2018)

## Teaching Assistant at UPenn

(Undergraduate Courses)
Advanced Econometric Techniques and Applications (2020)
Integrative Studies: Poverty: History and Economics (2019)
Statistics for Economists (2018, 2019)
Industrial Organization (2017)
Introductory Economics (2017)

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