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Dear Members of the Search Committee,

I write to express my interest in your call for an Assistant Professor of Quantitative Social Science. I am a postdoctoral fellow in Advanced Statistical, Causal Inference, and Computational Methodologies in the Department of Political Science at McMaster University. I work with Dr. Michelle Dion developing a machine learning text analysis framework to understand social inequities in academic citations across the social sciences. I received my PhD from the Department of Political Science at the University of Illinois at Urbana-Champaign under the supervision of Jake Bowers, Matt Winters, Gisela Sin, and Avital Livny.

My research uses tools from design-based causal inference and computational social science to develop standards to navigate research design tradeoffs in experiments and quasi-experiments. My contributions are informed by my substantive work on the challenges to accountability and representation in the Global South.

My work is published in *World Development* and *The SAGE Handbook of Research Methods in Political Science and International Relations*. I have one solo-authored methods piece under revise and resubmit at the *Journal of Experimental Political Science* and two forthcoming chapters in edited volumes.

My primary research agenda focuses on the practices that researchers can adopt to improve statistical precision before data collection in survey and field experiments. In a *SAGE Handbook* chapter with Christopher Grady (USAID) and Jim Kuklinski (Illinois), we discuss the merits and challenges of increasingly complex survey experimental designs that improve precision at the expense of ecological validity. In a solo-authored piece under **R&R**, I introduce new tools to assess the validity of estimates in double list experiments. This is a variant of the list experiment that promises more precise results but comes with under-explored questionnaire design complications. In a working paper with Jake Bowers (Illinois) and Christopher Grady, we discuss the circumstances under which researchers should prefer biased yet precise estimators to analyze experimental data, including applications to block-randomization, covariance adjustment, and M-estimation. In another working paper with Erin Rossiter (Notre Dame), we argue how the gains in precision from adopting good practices in experimental designs, such as block randomization or repeated measurement of outcomes, can be offset by explicit or implicit sample loss.

I also maintain an agenda on navigating research design tradeoffs in quasi-experiments. In a

working paper, I address the challenge of choosing model specification to analyze geographic spillovers. In this setting, theory suggests multiple plausible pathways for spillovers, but current methods require researchers to assume a single one is the correct. This implies a tradeoff between narrow operationalizations that risk false positives and broad operationalizations that can introduce bias, and the discipline currently lacks a standard to guide this choice. I propose a model selection protocol that overcomes this difficulty by using a distance metric to identify alternative model specifications, and then choosing among them using a model selection technique of choice. I illustrate the usefulness of this approach by revisiting the findings of an experiment on the spillover effects of election observers on voter registration irregularities in Ghana.

My methodological agenda informs a substantive research program in comparative politics that relies on an original data collection effort in Brazil, combining text analysis and machine learning to construct the most comprehensive dataset of corruption infractions at the local level. I study the unintended electoral consequences of corruption that stem from politicians' strategic behavior. I argue that corruption revelation drives politicians in nearby municipalities to undertake preemptive behavior to ward off a negative reaction from their constituents. While previous literature suggests that partisans might react strategically to anticipate sanctions when their political party is linked to corruption, my work shows that this behavior is even more widespread, and that politicians fear being caught in an electoral anti-corruption wave even when there is no evidence of their own wrong-doing.

I also maintain a research program on the gendered electoral consequences of corruption with Kelly Senters Piazza (US Air Force Academy). In a forthcoming book chapter, we use my corruption infractions dataset to show how corruption revelation increases the proportion of female candidates running for mayor, but not their chances of winning elections. We attribute this to incumbents' incentives to counter the rise of female politicians. In another forthcoming chapter, we discuss the challenges and opportunities of different data sources to study gender and corruption.

This program extends toward the gendered evaluations of officeholders' performance in general. In a piece in *World Development*, we discuss how the COVID-19 pandemic has the potential to promote female political representation through increased discontent with the performance of male-led executives and by priming a health policy issue commonly associated with women. In work in progress with Virginia Oliveros (Tulane), Rebecca Weitz-Shapiro (Brown), and Matt Winters (Illinois), we use a survey experiment in Argentina to show gendered differential reactions to policy implementation.

My experience as a methodology and area studies postdoc at two separate institutions has given me the opportunity to teach courses in comparative politics and quantitative methods. In the spring, I will teach an applied research design course on public policy and public opinion at McMaster. At Tulane, I taught an introductory course in comparative politics and a senior seminar on the use of randomized controlled trials to address social and political challenges in developing democracies. My work as the methods editorial assistant for the *American Political Science Review* also puts me in a unique position to gain exposure to the most current methods in the field, awareness of which I can incorporate into my teaching and mentoring.

In my time at Illinois, I served as a teaching assistant for statistics courses at the undergraduate and PhD levels using a flipped classroom approach. I served as a math camp instructor for incoming graduate students for three consecutive years and started a collaborative project in which graduate students introduced their peers to new methodological tools. I also taught an online course on the politics of developing countries as an independent instructor and served as a teaching assistant for its in-person version. These experiences have prepared me to teach to a diverse student body, to adapt to both online and in-person platforms, and to teach at the intersection of methodological theory and application.

I am prepared to teach courses on causal inference, computational social science, statistics for public policy, and the politics of the Global South. You can find copies of current and sample syllabi in my website. As a first-generation scholar, my teaching philosophy emphasizes building skills for students with different background and career goals.

I believe my expertise makes me an excellent fit at Stevens Institute of Technology. If you have any questions, you can contact me via email or phone.

Sincerely,

Gustavo Diaz
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McMaster University