How to Make Causal Inferences Using Texts

Justin Grimmer, PhD
Professor
Departments of Political Science
Stanford University

Abstract: New text-as-data techniques offer a great promise: the ability to discover, measure, and then utilize text-based variables for testing social science theories of interest from large collections of text. We introduce a conceptual framework for making causal inferences with text-based measures as either a treatment or outcome. We argue that nearly all text-based causal inferences depend upon a latent representation of the text and provide a set of sufficient assumptions to identify causal effects when text is used as a treatment or outcome. We provide a framework to learn the latent representation—justifying the use of popular unsupervised methods such as topic modeling or principal component analysis—and then estimate causal effects with the same sample used to learn the latent representation. But estimating the latent representation, we show, creates new risks: we may introduce an identification problem or overfit. To address this problem we introduce a split-sample framework. We apply our framework to study whether increasing the proportion of women on Congressional committees leads to more representation of women’s ideas during the legislative process and to assess how partisans respond to social media messages from President Trump.