Perspectives on Computational Analysis

Problem Set 7- Q3

a) When it was first introduced in the 1960s, Rational Choice Theory faced two primary criticisms. The first applied ex-ante at the level of implausible model assumptions (regarding the preferences, computation capabilities or knowledge of social actors). The second related ex-post to the predictions generated by such models. Both the assumptions and predictions were considered to not match empirical observation.

b) Mental simulation in everyday life tends to be applied both ex-ante (to predict the future behaviour of actors) and ex-post (to rationalize the observed past behaviour of actors through inferences on either the actors themselves or the situational context they were placed in). The author adds that human beings switch between these two modes frequently and unconsciously. The author concedes that this modus operandi- which he refers to as 'commonsense theories of action'- often prove useful in daily situations. However, their validity in those narrow contexts can mislead social scientists to erroneously consider them universally valid.

This 'understandability' of an explanation for an observed phenomenon (making 'sense' intuitively) cannot serve as an epistemic substitute for causality (claims on the specific or even generalizable causal mechanism). Moreover, seemingly important mechanisms- when assessed ex-ante- could well produce incorrect predictions. Conversely, predictably accurate mechanisms- when assessed ex-post- could not even have been reliably known ex-ante. While such errors in daily situations are either minor or swiftly fixed through feedback mechanisms, they can prove far more lethal if unconsciously embedded and remaining unquestioned within social science literature.

Thus, Watt's primary concern is that reliance on commonsense theories of action (via mental simulation) due to their narrow scope and fallibility cannot serve as the foundation for developing sociological theories that are broadly applicable and would produce scientifically valid explanations.

c) Watts concedes that no universal solution exists to the problems he outlined with respect to rational theory and causal mechanisms. However, he asserts that several existing partial solutions may be harnessed. Moreover, all

of them address Woodward's (2003) 'what-if-it-had-been-different' question while also presenting distinct standards of evidence to justify these claims.

His solution consists of three parts. Firstly, he advocates experimental methods in sociology to the extent possible (in order of preference- field experiments, natural experiments and quasi-experiments, and finally, lab experiments).However, these suffer on the grounds of generalizability and successfully studying collective entities. Next, he suggests non-experimental counterfactual methods (based on statistical modelling), preferably with observational studies with large sample sizes. Finally, he suggests that explanatory hypotheses be evaluated by their predictive abilities largely through out-of-sample testing, which would facilitate not only individual probabilistic predictions, but also broader predictions on outcome patterns and stylized facts. Prediction, if thus defined, would allow for rigorously testing of a variety of methods and types of studies.

d) A model, by definition, aims to isolate or focus on only one aspect of an observed phenomenon, and accordingly ignores or sidelines others- thereby separating the 'signal' of importance from the noise (Silver, 2012). Theory thus helps not only in determining which data to focus on, but establishes a hierarchy of salience within that data of the relationships between specific variables- a critical concern in the digital age of massive datasets. This helps researchers identify and fine-tune theories on causal mechanisms.

Furthermore, models help make assumptions on these mechanisms explicit. For example, Keane (2010) develops the example of draft lotteries as natural experiments (cited in this paper) and highlights how even such 'ideal instruments' provide no information on a priori assumptions. Imbens and Angrist's (1994) subsequent research on conscription for the Vietnam War found heterogeneous effects of service on veterans' earnings, and a general decline- but without establishing any chain of causality. Keane (2010) asserts that a priori assumptions would be essential to derive any meaningful insights from data beyond the most basic descriptive statistics. Theoretical models merely spell out these assumptions explicitly, thus setting the stage for inference and allowing for disproving and revision of theories in case found to be untenable for the research questions and causal mechanisms they seek to address.

REFERENCES

Keane, M (2010), '*Structural vs. atheoretic approaches to econometrics*' Journal of Econometrics 156 (2010) 3–20

Imbens, G., Angrist, J., (1994). '*Identification and estimation of local average treatment effects*.' Econometrica 62, 467–476.

Silver, N. (2012). *The signal and the noise: Why so many predictions fail--but some don't*. New York: Penguin Press.

Woodward, J. (2003) '*Making Things Happen*: A Theory of Causal Explanation,' Oxford University Press