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Research Statement
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I am an economic theorist in the Economics Department at Brown University, working mainly on Game Theory and Behavioral Economics. In particular, I focus on bounded rationality and non-equilibrium solution concepts using both analytical and experimental methods. My current research explores the limit of the revelation principle, a capstone result in mechanism design, when agents are boundedly rational or the planner faces constraints in her choice of a mechanism.

In my Job Market Paper "*Mechanism Design without Rational Expectations*", I study whether incentive compatibility is necessary for full implementation in non-equilibrium solution concepts. To this purpose, the paper takes a novel approach to implementation theory and characterizes the class of all solution concepts requiring Bayesian Incentive Compatibility for implementation. I find that incentive compatibility is necessary for implementation whenever agents can accurately predict the mechanism's outcome, even if they do not correctly forecast the strategies their opponents use. Surprisingly, this condition is not very restrictive for the implementation of social choice functions. On the contrary, this condition is very close to assuming equilibrium for the implementation of social choice sets. This characterization informs us on the solution concepts for which traditional results hold and those for which they do not. For instance, it tells us Bayesian Incentive Compatibility is often necessary for full implementation in Δ-rationalizable strategies, a solution concept that had not been considered in the implementation literature yet.

My JMP is the starting point of a broader research agenda aimed at understanding which game-theoretical results extend to non-equilibrium solution concepts.

The first step is to apply the approach developed in my JMP to other results and implementation frameworks. My paper "*The Revelation Principle without Rational Expectations*" extends the discussion of my Job Market Paper to partial implementation and provides sufficient conditions on the solution concept to ensure any implementable social choice rule is implementable with a direct mechanism. The most restrictive sufficient condition bite is akin to independence of irrelevant alternatives, and it requires that eliminating actions that are not played should not affect the solution of the mechanism. This allows me to prove, for instance, that there is no loss of generality in focusing on direct mechanisms if we adopt Rabin and Eyster's (2005) Cursed Equilibrium as a solution concept. This paper is at an earlier stage than my JMP, and I plan to expand it by studying other solution concepts (in particular, Sampling Equilibrium and Naive Bayesian Equilibrium) and

by exploring other applications where partial implementation may require Bayesian Incentive Compatibility.

Other early-stage works are part of this agenda as well. "*Bayesian Monotonicity without Rational Expectations*" discusses necessity of Bayesian Monotonicity (and related conditions, as Weak Interim Monotonicity from Kunimoto et al., 2023) for full implementation. As Bayesian Incentive Compatibility and Bayesian Monotonicity characterize the class of social choice functions that are implementable in Bayesian Nash Equilibrium, such a result would allow us to characterize the class of solution concepts for which implementation is at least as restrictive as Bayesian implementation. Preliminary results suggest that this class may be small because necessity of Bayesian Monotonicity imposes more significant restrictions on the solution concept than Bayesian Incentive Compatibility. As part of this agenda, I will also study whether Bayesian Incentive Compatibility is necessary for virtual implementation. This application is of particular interest as Serrano and Vohra (2005) show that, under mild conditions, Bayesian Incentive Compatibility characterizes the class of virtually implementable social choice functions. For instance, this would allow us to say that virtual implementation in solution concepts as level-k reasoning is weakly more restrictive than virtual Bayesian implementation.

I plan to expand on this agenda by studying the implications of my JMP's approach for other results in mechanism design (such as restrictiveness of continuous implementation[1]) and, more broadly, to various topics in game theory, such as the revelation principle in information design, incentive compatibility in moral hazard problems, and the folk theorem.

In my ongoing work "*Revelation Principle and Opportunity Constraints*", I study mechanism design problems in which the planner faces a constraint on the set of mechanisms she can use for implementation. I focus on constraints on the opportunity sets of the mechanism, which are useful to model (among others) implementation on an exogenous network, implementation with priorities, and implementation via network formation games. Interestingly, in these first two cases (and, in part, in the latter case), the revelation principle holds as in the classical model, and we identify a new condition that is necessary and sufficient for partial implementation.

My work on solution concepts makes use of experimental methods as well. In an ongoing project with G. De Clippel, R. Fonseca, P. Ortoleva, and K.Rozen, we study the use of rules of thumb (heuristics) in iterative reasoning, netting out the effect of strategic beliefs and other-regarding preferences with a novel design. This design allows us to estimate how many subjects use heuristics in iterative reasoning and how the heuristic chosen is affected by monetary incentives and the complexity of the problem. We plan to run Prolific sessions for the main treatments this fall.

[1] De Clippel et al. (2023) prove that insisting on continuous implementation is very demanding for Bayesian Nash Equilibrium but almost immaterial in level-k reasoning models. Does the same result hold for other solution concepts?