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Research Statement

I am a microeconomic theorist with broad interests in information economics and dynamic games. My research focuses on two primary areas: the costs of information and the strategic use of information in dynamic environments. In this statement, I will summarize my four research papers on these topics and outline my future research trajectory.

1 Information Economics

In recent years, economic theorists have increasingly focused on how economic agents make decisions regarding information across different contexts. This inquiry has expanded to include situations where information is costly, raising critical questions about which cost functions are suitable for modeling these decisions. A widely accepted minimum requirement is *monotonicity*: more informative options should entail higher costs. This is formalized by the classical information orders of Blackwell [1951, 1953] and Lehmann [1988].

In my job market paper, "*On the Monotonicity of Information Costs*," (with Xiaoyu Cheng), we develop a unified framework for characterizing the monotonicity of information costs with respect to both the Blackwell and Lehmann orders using first-order conditions. Our primary contribution is the first general characterization of Lehmann monotonicity, filling an important gap in the literature. We show that these local first-order conditions—which we term "decreasing in signal replacement" for the Blackwell order and "decreasing in reverse signal replacement" for the Lehmann order—are sufficient for global monotonicity. Our primary technical contribution is a method for constructing informativeness-reducing paths between comparable experiments. This method overcomes the non-convexity of the set of MLRP experiments by ensuring the constructed paths lie entirely within it, allowing us to apply the characterizations to several widely studied classes of information costs.

This work is built on my paper, "*Comparing Information in General Monotone Decision Problems*," (**Journal of Economic Theory, July 2023**). In this paper, I introduce a novel criterion for comparing information structures in monotone decision problems. I develop a condition called *monotone quasi-garbling*, which means that one information structure is obtained by adding *reversely monotone noise* (more likely to return a higher signal in a lower state and a lower signal in a higher state) to another. This provides a garbling characterization for the Lehmann order

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and extends its applicability to multidimensional monotone decision problems, such as nonlinear monopoly pricing and optimal insurance.

2   Dynamic Games

When economic agents work to complete a project, there can be multiple paths to completion, with each path potentially involving several rounds of success, namely progress. This raises the question of which path to take based on the information about the progress. In the following two papers, I explore this question in an agency setup and in an innovation race setup.

First, in "*Execution vs. Training under Endogenous Deadlines*," (with Curtis Taylor), we study the role of intermediate progress as a monitoring device in managing projects. We analyze a dynamic principal-agent problem where the principal dynamically chooses between a direct execution route and a multi-stage training route with an observable milestone. To mitigate moral hazard, the principal commits to an endogenously determined deadline. We show that the optimal contract is shaped by the interplay of three forces: the "milestone effect" from the training route's monitoring advantage, the "deadline effect" that favors the simple execution route as time runs short, and the relative efficiency of each path.

Next, in "*Strategic Concealment in innovation races*," (with Francisco Poggi), we explore how firms' private acquisition of technology impacts R&D dynamics in innovation races. (This paper is in revision for *American Economic Journal: Microeconomics*.) When firms privately acquire an interim technology, they face a trade-off: patent (disclose) the discovery to enable licensing, or conceal it. We show a "hold-up problem" can arise: patenting reveals the firm's advantage, which allows the rival to adopt a "fall-back" R&D strategy, strengthening its bargaining position in licensing negotiations. This can make concealment privately optimal even when disclosure is socially efficient. Our main result shows that when both the *stake of winning the race* and the *strength of prior-use defense* are sufficiently high, firms conceal their discoveries. This implies a non-monotonic relationship between the prize for innovation and the social speed of innovation, offering new policy insights on the design of the patent system.

Future Research   These four papers are broadly emblematic of my research interests and plans for future work. I am motivated in my research to apply the powerful tools of economic theory to understand and resolve real-world problems. Incentives and information are ever more at the root of such problems, and the need for careful discerning analysis has never been more present.

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