Research Statement
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I am an economic theorist with interests in Psychology and Economics and Contract Theory. The bulk of my research attempts to extend standard economic models in two directions: incorporating imperfect memory and imperfect self-knowledge in models of choice; and allowing for multidimensional information asymmetries in screening and signaling models.

This research statement is organized as follows. The first section discusses my work on Psychology and Economics. The second section discusses my work on Contract Theory. In the third section, I briefly describe my plans for future research.

1. Psychology and Economics

In the field of Psychology and Economics, my research has focused mostly on how imperfect self-knowledge may provide a unified explanation for several deviations from standard economic models.

In my job market paper, *Imperfect Memory and Choice Under Risk* [1], I present a model of choice based on imperfect memory and self-deception. The model assumes that people have preferences over their own attributes and can, to some extent, manipulate their memories. It provides a unified explanation for several empirical regularities from the literature of choice under risk. Decision-makers behave as if they were ambiguity averse. However, as proposed by recent experimental papers, ambiguity aversion in my model is related to the decision-makers' self-perceptions. The model also formalizes the informal social psychological theory of regret aversion based on self-perceptions proposed by Josephs et al (1992). In a repeated version of the model, I show that the decision-maker's behavior converges to the one predicted by expected utility theory after a choice has been made a sufficiently large number of times.

Extending on the idea of imperfect self-knowledge, I am working on a model of lying and deception aversion based on an individual's self-perception (*Lying and Deception Aversion: A Self-Perception Interpretation* [2]). First, I show that self-signaling may provide a foundation for lying and deception aversion (see e.g., Gneezy, 2005). Second, I propose experimental tests that distinguish between this self-signaling model and other models of lying and deception aversion. I intend to run these experiments in the near future.

The paper *Competition Over Time-Inconsistent Consumers* [3] combines my interests for both Psychology and Economics, and Contract Theory. It analyzes how competitive firms respond to consumers' time-inconsistency. I consider a competitive market where consumers have quasi-hyperbolic preferences. Competition leads to a stark asymmetry between immediate-costs goods and immediate-rewards goods.

For immediate-costs goods, the quantity consumed under competition is the same as in the monopoly case and, when consumers are sophisticated, the allocation is efficient. When consumers are partially naive, the optimal sales tax may be either positive or negative and depends on parameters that are hard to estimate. For immediate-rewards goods, however, the equilibrium features marginal-cost pricing and is always inefficient. Therefore, competition prevents firms from adjusting prices so as to provide commitment devices to consumers. In this

case, the optimal tax does not depend on the consumers' degree of naiveté and is a function of parameters that are easy to assess.

2. Contract Theory

An important result in models with asymmetric information is the Revelation Principle, which states that any allocation process can be replicated by a mechanism in which participants are asked to reveal their private information. The Revelation Principle reduces a possibly complicated problem to an easy-to-state mathematical-programming problem, where agents prefer to reveal their private information honestly (incentive-compatibility). However, the general analysis of such mathematical-programming problem is not straightforward.

Most of the literature assumes that private information consists of a one-dimensional type parameter and that the marginal utility of taking the action can be ordered (single-crossing condition). My joint work with Aloisio Araujo and Humberto Moreira characterizes incentive-compatibility under conditions that are weaker than the single-crossing condition and allow for multidimensional types.

In the paper *A Model of Mixed Signals with Applications to Countersignaling* [4], we show that signals may convey both positive and negative information when types are multidimensional. We use the model to discuss the phenomenon of countersignaling, which refers to situations where signals are nonmonotonic in the informed agent's skills. We also discuss the evidence on the GED exam, according to which students who acquire the exam have higher cognitive skills but lower non-cognitive skills than those who do not acquire the exam.

In the paper *Multidimensional Incentive-Compatibility: The Multiplicatively Separable Case* [5], we characterize incentive-compatible allocations when types may be multidimensional and the utility function is multiplicatively separable. Since multiplicatively separable utility functions may not satisfy the single-crossing condition, this generalizes standard results. This characterization allows us to obtain the optimal contracts in multidimensional screening as well as the equilibria in multidimensional signaling models. Our characterization has several potential applications. For example, one easily obtains a characterization of optimal second-degree price discrimination when types are multidimensional. The results also allow us to generalize the characterization of optimal screening contracts in the random participation model of Rochet and Stole (2002) for arbitrary distributions of types and arbitrary (multiplicatively separable) cost functions.

Next, we determine the implications of signaling and screening models when the single-crossing condition is violated. For signaling models, any function from the space of types to the space of actions and an increasing transfer schedule can be rationalized as an equilibrium profile. Therefore, apart from the monotonicity of transfers in costly actions, all the properties from standard signaling models are implied by the single-crossing condition. We obtain an additional necessary and sufficient condition for screening models.

In an influential paper, De Fraja (2002) studies the optimal educational policies when the ability to benefit from education is private information and individuals have quasi-linear utilities. He shows that the optimal policies are regressive in the sense that (i) individuals with higher income pay *less* for education, and (ii) controlling for wealth, individuals with higher ability obtain more education. In a paper coauthored with Humberto Moreira [6], we consider the optimal policies when preferences are not quasi-linear and, therefore, a utilitarian social planner has preference for wealth redistribution. In this case, the single-crossing condition fails and a full characterization is

not straightforward. Nevertheless, we show that implementing *progressive* educational policies may increase the utilitarian social welfare. Furthermore, profiles of education which are strictly increasing in the individual's ability may not be incentive-compatible.

The paper *Asymmetric Information in late 19th century Cooperative Insurance Societies* [7] is an empirical study of cooperative insurance. Between 1880 and 1930, cooperative insurance societies were the main source of illness, accident, and death insurance in the United States, Canada, and England. In this paper, I analyze how these societies dealt with informational asymmetries and how their pricing policies affected the membership profile. I show that, as a consequence of a combination of non-actuarial pricing and an explicit policy of preventing individuals over 40 years old from joining, individuals tended to defer their membership until slightly before they became 40.

3. Concluding Remarks

Looking forward, I anticipate extending my research on how incorporating psychologically motivated assumptions in economic models may give us a better understanding of individual and market behavior. Moreover, although most of my research has been theoretical in nature, I have recently started working on laboratory experiments. I believe that the use of experiments provides a natural methodology to test our theories. Thus, I also plan to continue work on this area in the future.

Research discussed above

[1] Gottlieb, Daniel, 2008. "Imperfect Memory and Choice Under Risk," MIT.

[2] Gottlieb, Daniel, 2008. "Lying and Deception Aversion: A Self-Perception Interpretation," MIT (in preparation).

[3] Gottlieb, Daniel, 2008. "Competition Over Time-Inconsistent Consumers," Journal of Public Economic Theory 10, 673-684.

[4] Araujo, Aloisio, Daniel Gottlieb, and Humberto Moreira, 2008. "A Model of Mixed Signals with Applications to Countersignaling," Rand Journal of Economics 38, 1020-1043.

[5] Araujo, Aloisio, Daniel Gottlieb, and Humberto Moreira, 2008. "Multidimensional Incentive-Compatibility: The Multiplicatively Separable Case," MIT and Getulio Vargas Foundation.

[6] Gottlieb, Daniel and Humberto Moreira, 2008. "Should Educational Policies Be Regressive?" MIT and Getulio Vargas Foundation.

[7] Gottlieb, Daniel, 2007. "Asymmetric Information in late 19th century Cooperative Insurance Societies," Explorations in Economic History 44, 270-292.

Other cited works

De Fraja, Gianni, 2002. "The Design on Optimal Educational Policies," Review of Economic Studies 69, 437-66.

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Josephs, Robert A., Richard P. Larrick, Claude M. Steeleb, and Richard E. Nisbett. 1992. "Protecting the Self From the Negative Consequences of Risky Decisions," Journal of Personality and Social Psychology 62, 26-37.

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