1 Introduction

This is a book on advice, its importance for decision making, and its influence on the evolution of conventions of behavior. The idea is simple. As societies progress, old generations of social agents die and are replaced by new ones. We are interested in what happens in this transition as the old guard instructs the new arrivals about the wisdom of their ways. Do new entrants listen and follow the advice of their elders or dismiss it? Is intergenerational advice welfare-improving or can it be destructive? Many times wise advice is rejected only to have new generations repeat the mistakes of their parents instead of learning from them.

But advice also exists outside of this intergenerational context. In our everyday lives we are constantly asking for advice from friends, family, and experts. The question here is how does advice alter our thinking about the problems we face and the decisions we make? If advice is influential and ubiquitous, then it needs to be incorporated into economic theory, yet it hardly is. If advice is influential, then experiments performed without it may be missing some external validity. Also, if advice is beneficial, then there should exist a market for it and people should strive to be the type of people from whom others seek advice since such a person is likely to gain influence, power, and wealth.

Advisors need not be experts. There is also something beneficial in seeking advice from someone who is as naive as you are about the decision you are about to make because simply discussing things and hearing a different opinion is valuable. As we will see later, in some situations people do not seem very capable of learning lessons from the past, and simply presenting them with historical data is

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not enough to allow them to behave properly. That data must be interpreted and that is where advice plays a role. As the saying goes, if we can't learn from the past "we are condemned to repeat it", but we are more likely to repeat past mistakes if we misinterpret the past, and good advice helps us avoid that mistake.

The types of questions we want to ask here are rarely asked by economists and social scientists in general but they are natural ones to think about if we are interested in learning why we behave the way we do and, as a result, have the set of conventions we have governing our daily lives.

In the pages below we will demonstrate that the impact of advice is varied and complicated. Most often, having advisors makes things better, but sometimes they make things worse. Sometimes people follow the recommendations of their predecessors or advisors and sometimes they reject them. Sometimes the conventions of behavior determined by our forefathers are adhered to and sometimes they are ignored. This makes life difficult but it also makes it interesting.

Our analysis here will be primarily experimental. In other words, we will investigate the impact of advice by conducting a set of laboratory experiments whose aim is to isolate the impact of such advice on strategic decision making. While our experiments will all be theory driven, in the sense that we will rely on theory to guide us in our investigations, our focus is empirical and our aim is to use experimental methods to tell a story about a phenomenon that is a feature of our daily lives – decision making (strategic and non-strategic) under the influence of advice and the conventions of behavior created in such environments.

On a methodological note, the use of advice in experiments has numerous benefits. In a profession that celebrates revealed preference, allowing an investigator to read the advice one decision maker offers another provides an insight into that subject's thinking that cannot be

obtained by viewing actions or choices alone. For example, offering a 50–50 split of a $100 pie in an ultimatum game may appear to be a sign of a preference for equity, but that interpretation may have to be modified when one reads advice that suggests that equity is a constraint and not a goal. To illustrate, consider one piece of advice offered by one of our subjects to her generational successor in an ultimatum game discussed in Chapter 5:

> The guy before me thought I should send 50. Although that would be fair, it's not going to maximize your payoff. I was greedy and offered 10, thinking that the other guy would accept anything he got, BUT that wasn't the case. They rejected. So my advice is to be a little more generous, so about 30 should do it. Good luck.

From this quote we see how complex a subject's thinking can be before she makes a decision. Seemingly generous actions are many times not that at all but simply strategic ploys. Having insights into the minds of subjects via advice is invaluable. It allows us to avoid inference when direct evidence exists. It answers the question often heard in seminars: "Why don't you just ask the subjects why they did what they did?" With incentivized advice, advice where the advisor has an incentive to provide her best guess as to what the right action is for the advisee to take, we get a direct pipeline into the mind of the decision maker and her explanation of what is the best choice to make. There is little need to fall back on fancy inference to estimate subject preferences. We can just listen to them verbalize their thinking. Finally, the comments made as advice may lead to insights that can be explored in future experiments and therefore be used to generate new avenues of exploration.

In the remainder of this chapter we aim to introduce the types of problems that motivate our discussion (societal and man-made problems or mechanisms) and the need they create for societies to establish conventions of behavior to solve them and

then pass these conventions down from generation to generation via intergenerational advice. We will also discuss the influence of advice on decision making outside of this intergenerational-game context.

I.I   THE SOCIETAL PROBLEM

All societies, as they develop, must solve a set of problems in order to function properly. For example, they have to choose a religion (Judaism, Christianity, Islam, Hinduism, etc.), a legal system (common or civil),[1] a banking system, a political system (monarchy, parliamentary democracy, etc.), a set of inheritance laws (primogeniture or ultimogeniture), a system of property rights (common or private), a constitution, a family structure (liberal or authoritarian),[2] what commodity to use as a medium of exchange (Kiyotaki and Wright, 1989; Li, 1995), and even what side of the road to drive on. Those societies that solve these problems efficiently and create the proper set of conventions or institutions to deal with them flourish while those who fail to do so stagnate.[3]

However, as Kloosterman and Schotter (2016) point out, finding the proper set of solutions to these societal problems is not easy since these problems are interconnected. Solving one problem early in the history of a society may preclude or constrain the proper solution to a different problem later on or create externalities not envisioned.

For example, consider the problem of choosing a religion. If early in its development a society chooses Islam as their religion, it will find itself constrained later on when it has to decide on the rules of a banking system and lending, since lenders will be constrained not to charge interest. Islamic banking (see Kuran, 2012) looks different from Western banking because of the different religious paths selected. Also there is evidence that Protestant societies developed differently

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[1] See, La Porta et al. (1998) and Glaeser and Shleifer (2002).

[2] See Todd (1989, 1990) (strong or weak) and Alesina and Giuliano (2010, 2015).

[3] See the classic study by Acemoglu and Robinson (2012) for an exhaustive study of the importance of institutions for economic development, as well as North (1990).

than Catholic societies (until the ban on usury was lifted), again because of their stricture on the use of interest.

In addition, the way inheritance is determined may have large unintended or unanticipated consequences for the institution of marriage. For example, primogeniture, an inheritance system where estates are passed on to the first-born male child, was created in order to consolidate family wealth and prevent it from being diluted by splitting it across many heirs. Of course this meant that all children in the family except the first-born male were excluded. As any reader of Jane Austen knows, this rule had a great impact on the institution of marriage and the marriage market for the daughters of the wealthy where such women spent inordinate amounts of time searching for wealthy mates and consciously forcing a type of assortative mating that might not have occurred otherwise. It also impacted the disinherited male offspring who took up careers in the military or the church or careers trying to snag a wealthy wife and spare themselves from a career in trade which they disdained.

Such questions, about the emergence of conventions, was the focus of *The Economic Theory of Social Institutions* (Schotter (1981)). That book asked how social institutions (defined as conventions) emerged to solve societal problems. This book takes the next step and asks how such conventions, once established, evolve over time through a process of intergenerational advice.[4]

Our answer to this question is intimately related to social learning and advice giving. Basically these formative societal problems do not disappear once a convention is established to "solve" them. Rather they form a set of recurrent problems or games that are played by sets of generational agents who pass on advice to their successors about adhering to the established convention or not as they arrive

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[4] One could think of the questions we ask here as starting after a convention has been established and asking what happens from that point on, i.e., how stable is the convention, if there are multiple equilibrium conventions, will one emerge or will life fluctuate between them.

to take their place in society.[5] The idea is that, while such games have infinite lives, the people playing them have finite lives and when they die or retire they pass on advice to the next generation of players. In some sense the conventions created in the past need to be maintained.[6]

To illustrate, consider the CEOs of major corporations (Ford and GM) who play a Cournot pricing game against each other for which certain (possibly collusive) conventions exist. When they retire and are replaced by new blood, they take their successors aside and pass on advice about the industry norms, corporate culture (conventions), and how to interpret the actions of their opponents.

Presidents and prime ministers of countries pass on advice about the way international affairs are conducted when they leave office as possibly exemplified by the famous letters that exiting U.S. presidents leave for their successors in a drawer in the desk of the Oval Office (in addition to the extensive briefings that their staffs exchange).

In game-theoretic terms, while the games people play may have infinite lives, the people who play them have only finite lives and when they retire or die they are replaced by new agents who take their place. These generations are connected by a sense of generational caring in that each generation cares about the welfare of its successor and hence passes on advice that takes their welfare into account. For example, parents care about their children and as a result pass on advice that they feel is in their best interest (Bisin and Verdier, 1998, 2000). CEOs of corporations may have retirement packages tied to the performance of the firm after they retire and hence have an incentive to offer profit-maximizing advice above and beyond the pride they may have in the firm they devoted their life to doing

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[5] Of course, as the world changes over time, conventions may find themselves outdated and as a result may need to be abandoned. That may require coordination and advice.

[6] These agreed-to conventions form the culture of a society since societies differ culturally when they create different sets of conventions to help them solve the same set of societal problems they all face.

well. As a result, generational agents learn how to behave by being socialized by their predecessors and passing on their wisdom to future generations. This is the social learning process we will investigate in this book.

This framework defines what we will call an "intergenerational game" where sets of generational agents play an infinitely repeated game for a finite amount of time and when they leave pass on advice to their successors. Because of intergenerational caring, the advice offered is potentially beneficial and should be considered seriously by successors.

Note that such a setup differs considerably from the way economists typically view infinitely repeated games and social learning. In the conventional theory of repeated games, sets of players live forever and discount their future payoffs.[7] The fact that they have an infinite future together leads them to contemplate how their actions today will influence the shape of their relationship in the future. The opportunity to punish bad behavior today with punishments in the future keeps players under control and encourages cooperation. However, as I said above, while games may last forever, e.g., there may always be a GM and a Ford playing an oligopoly game,[8] their CEOs do not and hence it seems natural to look at infinitely repeated games through an intergenerational lens. This takes the focus off of the relationship built between two infinitely lived agents and the punishments that might occur when equilibria are deviated from, and places it on the kind of advice offered between generational agents and their willingness to follow the advice of their elders or predecessors.

Our view of social learning also differs from the standard theory. In the conventional social learning problem (see Gale (1996),

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[7] There are models of reputation building where there is an infinitely lived player playing against a sequence of finitely lived opponents. Such models may be considered hybrids but they do not involve any intergenerational advice.

[8] The 2008 financial crisis did cast this assumption in doubt since the auto industry needed to be bailed out.

Bikhchandani et al. (1992), and Chamley (2004) for theoretical approaches and Anderson and Holt (1997) and Çelen and Kariv (2004, 2005) for experimental evidence) a set of decision makers make a choice sequentially one after the other. There is an unknown payoff-relevant state of the world and each agent, before they make their decision, is able to observe a signal about the state and also observe the choices that his or her predecessor(s) have made. What can not be observed is the signals observed by predecessors, that is private information. Based on their signal and the decision(s) of previous agents, the decision makers have to guess what the true state of the world is and, if they do this correctly, they receive a significant payoff. So in the standard social learning problem the object of learning is the discovery of the true state of the world, an objective truth. Learning is social because people can observe the actions of predecessors and update their priors accordingly.

The type of social learning we study here is very different. Here (with the exception of Chapter 10) there is no objective payoff-relevant state of the world that has to be discovered. What each generation has to do is decide on how to behave in the game defined by the societal problem they are facing. This means that they have to learn the convention governing the problem and assess what the likelihood is that their opponents also know it and are likely to follow it given the fact that each decision maker receives advice from his or her predecessor, knows that his or her opponent (or opponents) received advice but not what that advice is, and possibly knows the entire history of choices before him. What people want to learn here is how to behave in the situation they are thrust into and not what is the true objective state of the world. The convention established for the game they face is what they need to know and whether they can rely on others knowing and adhering to it. If they can, then one might expect it to persist but, as we will see often, the fact that a convention of behavior is firmly established today means little for the expectation that it will be adhered to tomorrow. The process of learning via intergenerational advice is typically stochastic.

1.2   ADVICE AND MECHANISM DESIGN

When we investigate the properties of economic mechanisms in the lab, we have a choice. We can study them in the environment defined by the theorist (using the game form defined by the mechanism) or the way they are actually played in the real world. To illustrate, let us look at school matching mechanisms, which we study in Chapters 12 and 13.

School matching mechanisms are typically installed in cities to manage the matching of students and schools. The theory for these mechanisms is, by and large, static and deals with a one-shot matching problem. In reality, however, the school matching problem is a recurrent problem faced by new parents every year. These parents engage in the match, and then exit only to be replaced by a new generation of parents in the following year. So the problem is a recurrent problem but one played intergenerationally with new generations of parents replacing old ones and receiving advice from them as to how to act strategically in the match.

For example, they may suggest applying to their second or third ranked school first in an effort to secure a slot out of fear of being closed out of all good schools by acting too greedily. They are advised to "play it safe" and not rank their first choice first. Such advice may come "horizontally" from parents in the same cohort as them, or "vertically" from previous generations as in our intergenerational setup. The question here is whether such intergenerational advice makes things better or worse? Do the parents establish a convention of behavior that is suboptimal and pass it along from generation to generation or does intergenerational advice lead to convergence to a stable matching (or perhaps an efficient one if the two are not synonymous)?

Questions about conventions are typically outside the purview of matching theory since, as mentioned above, these mechanisms are typically static one-shot games. We will investigate what happens to these mechanisms when they are played in an intergenerational manner for real.

Economic mechanisms present us with a different type of inter-generational problem than many of those we deal with earlier in our book. Basically a mechanism is a "man-made" game designed for us to play in order to achieve a given purpose, like matching students and schools in a stable manner or helping us contribute efficiently to a public good. These are different from what we might call "naturally occurring" problems which no one designs but just naturally occur. However, such mechanisms are typically employed to help us solve naturally occurring problems that we have failed to successfully cope with on our own. Such problems are similar to coordination problems like the problem of deciding which side of the road to drive on or naturally occurring externality problems like social dilemmas. There is no mechanism designer lurking behind the scenes here, only naturally occurring human dilemmas. The conventions established by society to deal with these naturally occurring problems substitute for the mechanisms imposed in other situations.

The interesting aspect of looking at mechanisms played inter-generationally is that they may lead to unintended modes of behavior that the designer never anticipated. The consequence of this is the lesson that once, a mechanism designer puts a mechanism in place, she cannot just walk away and think that everything will be OK. Inefficient conventions of behavior can be established which, if not monitored, can lead to bad societal outcomes.

1.3   CHOICE UNDER THE INFLUENCE OF ADVICE

As we mentioned above, advice also exists outside of our intergenerational setting, and in several chapters, we investigate the influence of advice on decision making in static one-person decision problems. One issue here is that advice competes with other types of information that decision makers seek before making a choice. For example, someone may say "keep your advice, just give me data and I can make up my own mind". Here the decision maker might feel she is better at processing data than her advisor is and would rather rely on data than the filtering of such data through the mind of the advisor. One