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Paradigmatic experiments: The Dictator Game

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ABSTRACT

Recent experiments with the Dictator Game (and the ensuing discussions) have been affected by considerable confusion regarding the purpose of this design. A common complaint is that the design gives rise to fragile regularities and therefore is of little use for theory-testing. We take issue with this view, and instead argue that the Dictator Game is potentially a very useful tool for experimental game theory, if properly used. It is particularly useful for investigating social norms, but economists have failed to take advantage of the Dictator Game because they still lack an adequate theory of norms.

1. Introduction

In the postscript to the second edition of *The Structure of Scientific Revolutions* (1971), Thomas Kuhn highlights the role played by "exemplars" in defining and driving research within a scientific paradigm. Exemplars are paradigmatic cases of how "good science" ought to be done, and can take various forms: a theoretical model, a mathematical proof, a methodological device, an experimental set-up can all be "exemplars" in Kuhn's sense. A *paradigmatic experiment*, as the term will be used in this paper, is an exemplary experimental design in Kuhn's sense. Paradigmatic experiments are important at least for three reasons: they have (1) a pedagogic function, by showing students how a good experiment is to be designed and run; (2) a reference function, by generating robust regularities from which new effects can be detected once some details of the experimental design have been varied; and (3) a sociological function, by setting standards that differentiate practice in one discipline from what is done in neighboring fields (cf. Guala, 2008).

Studying paradigmatic experiments is particularly instructive, for what they can tell us about the research ethos and epistemic commitments of a scientific community. Experimental economics is no exception from this respect. Among widely replicated experiments in this field, the Double Oral Auction, Public Goods, and Ultimatum Games are perhaps best known to economists and other social scientists. Recently, however, a new design – known as the "Dictator Game" (DG) – has attracted increasing attention. The DG is probably the simplest experimental setting one can think of. Indeed, the interaction between players in a DG is so minimal that one wonders whether the term "game" is appropriate at all: two players are to divide a sum of money provided by the experimenter (say, 10 euros, for simplicity). Only one player, however, can determine the size of the shares—she is the "dictator", and the other player can only accept the proposed division.

The DG is often presented as the latest addition to an already long list of "anomalous" games in the experimental literature (cf. Camerer and Thaler, 1995). According to standard economic theory – based on the assumptions of rationality and self-interest – a dictator should keep 100% of the cake, and give nothing to the other player. As we shall see, this is not what happens in the laboratory, when subjects play the DG for real money. The rationality assumption is hardly questionable in a simple setting such as the DG: in the absence of major disturbances, it would be perverse to suggest that players do not understand the logic of this game. This leaves the selfishness hypothesis as the weak link in the standard economic model. Thus, unsurprisingly, much of the debate has focused on what the DG can teach us about sociality and human motives.

2. Altruism, fairness, and robustness

In a "standard" DG, only 40% of the experimental subjects playing the role of dictator keep the whole sum allocated by the

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experimenter.[1] The majority of individuals prefer to give something to the other player, and the amounts offered (including zero-offers) average at about 20% of the cake (Forsythe et al., 1994). These results seem to contradict the selfishness assumption, and are usually read as evidence of the importance of other-regarding motives in economic behavior.[2] Two such motives stand out as potentially relevant for the DG: dictators may be willing to give up part of their earnings because they care about others' welfare, but also out of a concern for the equality of the resulting allocation. To distinguish, we shall label them the *altruism* and *fairness* hypotheses, respectively.

That fairness and altruism are real phenomena is rather uncontroversial. Volunteering and donating to charities, for example, are important aspects of the non-profit sectors of all advanced economies, which help solve market failures of various kinds and fulfill other important social functions. What is controversial, or at least poorly understood, is the *extent* to which such fairness and altruism motives counteract selfish ones, the mechanisms that trigger pro-social motives, and the *conditions* under which they may become important for predictive and policy purposes. The importance of the DG for experimental economics and economic theory would depend accordingly on the relative magnitude and robustness of the phenomenon that has been observed. As a consequence, much recent work has been concerned with testing the robustness of donations to changes in the details of the experimental design.

Two points are worth clarifying: first, the issue at stake is not the *replicability* of the phenomenon. The standard rate of DG donations has been observed by independent researchers in different laboratories, and so have most of the variations on the basic design that we review below. The DG design, in other words, is not unreliable. What is at stake is rather the *robustness* of the observed phenomenon—or its replicability across a suitably wide range of circumstances and experimental conditions. The second important point is that this sort of 'robustness testing' should not be dismissed as a dogged attempt by dogmatic economists to get rid of an unwelcome result. On the contrary, robustness testing is a standard procedure across all the sciences: by varying the initial conditions of a design, one can explore the range of circumstances in which a phenomenon can be observed, and better assess its importance for theoretical, practical, and engineering purposes. A phenomenon lacking robustness lacks the second typical feature of paradigmatic experiments highlighted above.

Robustness tests are at the origins of some of the seminal and celebrated results of experimental economics. The convergence to efficient equilibria of markets with Double Oral Auctions was demonstrated by Vernon Smith (1962) while testing the robustness of classroom experiments conducted by Edward Chamberlin at Harvard in the 1940s. Chamberlin (1948) observed that experimental buyers and sellers fail to discover the price of market clearing, and interpreted this result as a confirmation of his own theory of monopolistic competition. Smith believed that Chamberlin's experiment had failed to give the standard theory a fair shot, and ran a replication changing a few key parameters of the experimental task. Crucially, he provided traders with a richer information environment by posting asks and bids on a public blackboard. Furthermore, he gave them the opportunity to learn by running repetitions under the same market parameters. In this new environment, Smith discovered that markets do generate prices that approximate (with time) the theoretical equilibrium.

Notice that some of Smith's modifications of the Chamberlin design were motivated by the desire to instantiate in the laboratory the conditions that the theory deems necessary for market clearing. Perfect information regarding prices is clearly a case in point. But not all such conditions can or indeed ought to be instantiated in the lab: if markets cleared only when there is an infinite number of traders or perfectly smooth supply and demand curves, for example, the theory could not even be tested in the laboratory. Moreover, some of the other changes made by Smith were not suggested by the theory: the theory does not say for example that repetition and learning are important for market efficiency.

It is worth keeping this in mind when assessing current experiments on the DG. Like Smith's seminal experiments, some of the recent literature seems to be driven by the desire to "give the standard theory a better shot". In a widely cited experiment, Hoffman et al. (1996) report a significant decrease of donations in the DG. The decrease is obtained by imposing strict anonymity ("double-blind")[3] conditions and by decreasing the "social distance" between subjects and experimenter, as well as among the subjects themselves. In this environment, 60% of dictators decide to keep the whole amount for themselves, and the proportion of subjects donating more than thirty percent of the cake decreases from about 40 to less than 10% of the sample.

But DG behavior can be pushed even closer to the prediction of standard theory. Cherry et al. (2002) have observed that 95% of subjects donate nothing when a "legitimacy" factor is added to double-blind anonymity. Legitimacy over the assets to be shared is induced by making the dictators earn money answering the questions of a GMAT[4] quiz. In an inexact science like economics, a 5% deviation from theoretical predictions is an impressive result indeed.

Other studies however suggest that DG behavior can be pushed in the opposite direction too. Mittone and Ploner (2008) use an environment that is identical to the Cherry et al. (2002) design, except that the recipients are asked to exert the same effort as the dictators (by answering a quiz) while not being rewarded by the experimenter (i.e. the recipients' effort does not contribute to the size of the cake to be shared). In this case, "asset legitimacy" has a much weaker impact on the level of donations, because it is counter-balanced by equity of effort considerations. Up to 80% of dictators now are willing to give something, and the average level of donations is *tripled* compared to the treatment with asymmetric effort.

A similar phenomenon was highlighted by Ruffle (1998), who observed the effect of asymmetric effort in a game where only recipients were asked to contribute to the size of the cake by answering a quiz. In a significant number of cases (about 20% of the time) dictators went so far as to offer more than half of the sum that recipients had earned. This effect was absent in the baseline condition where the recipient's earnings were determined by a random device. As expected, exerting effort increased the average level of donations too.

Other studies report an increase in donations when the recipient is identified with a "reputable charity" like the Red Cross, compared to an anonymous subject. Even in a double-blind environment, the Red Cross attracted donations from over 73% of the dictators, as opposed to only 27% in the anonymous recipients condition (Eckel

[1] An excellent survey of DG experiments can be found in Camerer (2003). Some of the papers cited in this article however have come out after the publication of Camerer's textbook.

[2] "Economic behavior" from now on is to be taken broadly as any kind of behavior having to do with the allocation of scarce resources, rather than narrowly as human behavior in the context of competitive markets. The broad definition is by far the most entrenched in both neoclassical and heterodox traditions.

[3] In most economic experiments subjects do not know each other's identity but, potentially at least, their identity is known to experimenters ("single blind" design). When appropriate procedures are put in place to preserve anonymity also to experimenters, economists speak of a "double blind" design.

[4] Graduate Management Admission Test.