

Mind, Reciprocity and Markets in the Laboratory  
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Fruitful social science must be very largely a study of what is not.

Hayek (1983)

The deep structure of human behavior falls into three interdependent categories: the internal order of mind; the external order of social exchange; and the extended order of markets. Each forms a complex self ordering system governed by endogenous rules reflecting individual and species experience, and biological /cultural evolution.

Most of our operating knowledge we do not remember learning because the learning was autonomic, imitative and formed by practice. By age four we were accomplished in a native language, capable of algorithmic inflection and syntactical construction. For English we added ed to convert verbs into their past tense form and s to obtain the plural of nouns, with some of the irregular exceptions yet to be memorized. Such learning required no instructions from mom or teachers; only listening, to initialize the circuitry with which we were born. Our vision circuitry had already learned to interpret flat retinal signals in perspective, so that we experienced the visual world as three dimensional, making us competent navigators, but necessarily vulnerable to optical illusions. Between age four and five (if unimpaired by autism) we learned to 'mind read,' to infer what someone must believe or think based on their actions or words, that a playmate will believe falsely that a toy is in the box if she did not see it being removed. Subsequently, on a flexible timetable, we learned ever more sophisticated social exchange behavior, enabling us to enjoy increasing gains from this trade, with the exception of the universal cross-cultural 3-4% of people who are socio-paths and who account for a large percentage of prison populations.

In 1952 Hayek, perhaps the 20th century's most versatile and deep intellect, articulated a model of perception subsequently corroborated by neurobiology, that experience is not formed, as we might think, by our receipt of signals reflecting fixed attributes of external phenomena. Rather, perception involves an interaction between current stimuli, and our past experience of similar conditions. Mental categories are formed dynamically out of the relative frequency of concurrence between memory and current experience. All perception is memory: what is stored are external stimuli modified by processing systems conditioned by past experiences.

A peculiarity of mind is its penchant for anthropomorphizing the order it sees in society. If human structures are well designed someone in the distant past must have designed them. Individuals, committees and legislatures make rules and laws, and the mind sees designers at work. But what is unseen is the process that ignores, alters in use, and/or substitutes emergent norms for portions of the rules, a process that no one monitors because such detailed histories are not recorded. If something is functioning, the mind sees it as an invention of a comprehending mind, not the cumulative state of countless trial-and-error modifications of countless myopic minds. Contrary to

brain research findings, the mind always believes it is in control, leading the neuroscientist, Gazziniga, to wonder why the brain fools the mind into *thinking* it is in control.

That the brain learns and accomplishes so much without resort to self-conscious direction is economical in that the brain decentralizes most of its activity to off-line processes, thereby economizing on scarce attending resources that are reserved for intervention in response to the demand for novelty, creativity and reasoning. Thus standard economic theory as learned and taught is based on reasoning; it derives rational constructivist models of interactive decision ranging from two person bargaining games to many person markets. In such analyses the models require information not given to any one mind in the worlds they represent; individual payoffs are common knowledge, and also that everyone is self-interested and competent to analyze choice consequences. The assumed conditions on interactive structure (the institution) and the payoff environment are easily reproduced in the experimental laboratory, with subject choices motivated by real money. What do we learn of human social and market behavior from these studies?

In two person games, people exhibit patterns of trust and trustworthiness, even when matched anonymously, that enable many to achieve payoff levels in excess of the narrowly self-interested outcomes predicted by theory, a *super rational* result of our biological and cultural adaptation. For example, in each session of a trust game experiment, 12 people are randomly and anonymously assigned to six pairs and to the role of player 1 (P1) or 2 (P2). Each pair faces the following move consequences: P1 can choose an equal split of \$20 between P1, P2, or pass to P2, in which case the prize increases to \$30; then P2 chooses between the alternatives \$12 for P1 and \$18 for P2, or \$5 for P1 and \$25 for P2. Theory predicts that since P1 will expect that P2 will go for the \$25, P1 will choose not to pass to P2. Hence, the equilibrium outcome is \$10 for each, wastefully leaving \$10 out of the potential \$30 prize, on the table. Many such experiments, including some that vary the payoff distribution within this trust structure (and the stakes are varied up to \$50), yield the following results: about half of the P1s pass to P2, and two-thirds to three-quarters of the P2s respond with the cooperative outcome, (\$12, \$18) in the above example. The rest defect, yielding (\$5, \$25). In punishment versions of the game, if P2 defects, play returns to P1 who at a personal cost can punish P2 with a lower payoff, e.g. in the above example P1 now chooses between defection (\$5, \$25), and (0, 0). Contrary to theoretical predictions, up to *half* of the defectors get punished in a single play of games of this type.

Why so much cooperation and the use of costly punishment options in single play games? Many convergent studies suggest that it is reciprocity: when P1 passes to P2, it enables both to increase their reward, affording P2 the opportunity to reciprocate the favor by choosing to cooperate. Humans are ceaseless social exchangers, always trading favors, gifts and services among associates. Bilateral exchanges of food for help are observed even among those in chimp and monkey communities. In humans this imperative is so strong that it survives in laboratory experiments where people will never know with whom they are interacting.

Subjects from the same population pools used in the above experiments have also participated in hundreds of laboratory bidding, auctioning and posted pricing markets with well-defined property rights. These market experiments show that human subjects behave very self-interestedly, tending to maximize the gains from trade in environments where information on value and cost is dispersed privately among the traders. This research illuminates the findings of Adam Smith and F. Hayek

that markets enable thousands even millions of people to specialize, and create wealth by cooperating through self ordering pricing systems without any one having to tell them what to do.

Remarkably, each of us functions in two worlds: one of personal exchange governed by self-policed norms of reciprocity (positive and negative) in which there is much intentional cooperation generating gains from such trades; another of impersonal exchange through markets governed by constantly evolving cultural rules invented by no one person, in which, unintentionally, and without awareness, we cooperate by pursuing our own self defined interests. Each world is a complex self-ordering system to which we, our parents, our parents' parents, etc have adapted and contributed to its evolution.

No doubt market exchange evolved out of social exchange, the latter enabling specialization long before this evolution would bring forth monetary exchange. As noted by Hayek these two worlds are governed by distinctive rule systems. The rules of solidarity (read 'reciprocity') based on intentional actions to do good, if used aggressively to intervene in the market system to 'improve' its outcomes, will destroy it. But *equally important*, if the self-interested motivations in markets are clumsily applied to families and small groups, it will crush them.

The convergent principles discussed above have emerged from theorizing, experimental testing, neuroscience, anthropology, psychology and philosophy. They constitute a powerful understanding of a world that has given us abundant life and enabled us to multiply and to replenish the earth to an extent beyond all comprehension by our ancestors, and potentially to bequeath untold fortune to our descendents.

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