

Ultimatum Game

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A small set of core innovations support the generalized-exchange theory. Perhaps the most critical is the axiomatic employee proactive preference for fair treatment by management. That employers have long ago accepted that fact about their employees is broadly indicated in the huge best-practices literature. More recently, equitable treatment became an early research interest of behavioral economists. While macroeconomists are at least vaguely aware of the “ultimatum game” (UG), the underlying message is sufficiently important to justify elaboration.

Ultimatum game. Güth, Schmittberger, and Schwarze (1982) constructed early UG experiments. There are two players. One is given a sum of money and a choice. He or she has to give some part of the money to the other player, who then also has a choice. If the offered cash is accepted, both players keep the allocated money. If rejected, each gets nothing. Mainstream neoclassical subgame-perfect equilibrium dictates that the UG (permissible) minimum would be offered and accepted. That outcome follows from economic theorists universally motivating agent utility with the preference for more, rather than less, money. Any positive sum is preferable to nothing, providing both players with clear marching orders.

Contrary to the predictions of economic models, Güth *et al.* found, first, a strong desire for fair treatment and, second, an urge to retaliate when denied that outcome. Their experiment and the many that followed have established that the modal outcome is to split the money evenly and that inequitable offers are rebuffed. Larry Samuelson (2005, p.97) concluded from his survey of experimental economics: “... experimental evidence has mounted that people will incur costs not only to bestow benefits on others, but also to penalize others, with the preference for reward or punishment hinging upon perceptions of whether the recipient has acted appropriately or inimically.” The ultimatum-game experiments are important and must make economists suspicious of their convenient formulations of individual preferences and utility.

When the game is played with subjects hooked up to MRI scanners, the results are even more enlightening. Stingy offers stimulate a part of the brain known to be associated with feelings of disgust. From Colin Camerer: “They can predict with good reliability, from looking at the brain, what a person will do. People whose brains are showing lots of disgust will reject offers.” (Postrel (2003), p.C2) UG researchers have learned a great deal about why and how perceived equity matters. Especially important to economics, they have established that unfair treatment motivates a desire to punish the perpetrator, even if the punishment involves personal cost.

Meanwhile, over in evolutionary biology, a related line of research has become mainstream. Over the hundreds of thousand years of human existence, an elemental concern about relative position has been hard-wired in the human brain. That natural-selection adaption improved survival probabilities by enhancing the capacity to specialize by working cooperatively. Arthur Robson (2001) came to the hard-wired conclusion in his review of the literature on the biological basis of economic behavior. Read Montague (2006, p.186), a prominent neuroscientist, does not qualify his support for the hard-wiring: “Our instincts for sensing and responding to fair exchange evolved in a social environment where tit for tat was king. What you did to me today was coming back to you tomorrow in kind.” (See also Frank (1999, 2005), Fehr *et al.* (2005), Zak *et al.* (2005).)

Workplace application. As a result of innovative research on the human brain, mainstream macro theorists’ casual dismissal of the preference for equity is surely coming to an end. A real-life version of ultimatum game, endowed with established workplace reference standards, incomplete information, quasi-rents, and available gradations of retaliation, is played every day in large work establishments. In the workplace game, employee desire for fair treatment is strengthened by the near-zero expected costs associated with reciprocal reductions in cooperation on the job if management fails to be attentive to perceived equity. With respect to wages, market opportunity cost is the minimum offer; but neither employers nor employees believe that minimum to be an optimal solution to the real-life game.

In the GEM Project, three classes of reference standards calibrate the inherent preference for equity: W^a (the best alternative wage), W^b (the interpersonal reference standard), and W^c (the intertemporal reference standard). There exists a set of labor prices $\mathbf{K}_j = \{W^a, W^b, W^c\}$, for which the worker’s preference for fair treatment is satisfied by the set’s least upper bound: $W_j^r = \sup \mathbf{K}_j$. Preference relation 2.7 in Chapter 2 of the eBook implies that instantaneous utility is strictly increasing in W_i/W_j^r up to unity and unchanged thereafter. The axiomatic preferences used in workplace-equilibrium modeling are broadly consistent with the extended-

utility approach pioneered by Duesenberry (1949) and Modigliani (1949) and, over time, have been used by a number of economists including Becker (1996) and de la Croix (2001).

Employees still prefer higher to lower wages, but they are now singularly dissatisfied when their compensation falls below the established reference standard. Moreover, given consumption and leisure, wages in excess of the reference standard produce nil gain in satisfaction. In reviewing the behavioral-economist literature, Rabin concluded: "Overwhelming evidence shows that humans are often more sensitive to how their current situation differs from some reference level than to the absolute characteristics of the situation."

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