Comment on van de Kragt, Orbell, and Dawes (Vol. 77, March 1983, pp. 112-122)

Van de Kragt, Orbell, and Dawes’s article, “The Minimal Contributing Set as a Solution to Public Goods Problems,” claims to present a new, spontaneously arising solution to the problem of efficient provision of a public good. Unfortunately, although there are potential points of interest in the reported experimental results, this solution concept is neither new, nor does it arise spontaneously, nor is this a “public goods problem” in the most important sense.

Let us consider these problems in reverse order. The central, defining feature of the public goods problem is that each individual’s contribution provides a net gain to the group, but a net loss to the contributor. Thus, it is individually rational not to contribute, but “socially rational” for everyone to contribute (see, for example, Olson, 1965, pp. 9-16). The problem presented by van de Kragt et al. is a game with a contribution threshold, above which a prize is awarded to all and below which no prize is awarded. There, the contribution may provide a net gain to the individual contributor, although there is a potentially larger net gain to be had by not contributing, depending on how many others contribute. The two concepts are compared in Table 1. In the published experiments, it is in a player’s interest to try to avoid making any contribution, but ultimately he or she can be put in a position in which there is a gain from contributing, and perhaps even a loss from not doing so. Although this can provide a sticky negotiating problem, it is not the public goods problem. In the true public goods problem, there is an inefficient, dominant-strategy outcome. In the authors’ game, there is an equilibrium that is inefficient (no contributors), others that are efficient (those where the minimal number contribute), and no dominant strategy.

The Minimal Contributing Set (MCS) is not a “solution” in the sense of being sufficient, merely by its existence, to drive participants to provide public goods optimally. First, as Table 2 in van de Kragt et al. indicates, communication among participants is crucial to optimal provision. It is only when they are allowed to communicate that participants can arrive at an ex ante agreement about who will provide the public good. Second, the structure of the experiment, as imposed by the experimenters, facilitates the enforcement of such an agreement. Following the communication period, all players are required to write down separately whether they choose to contribute or not. If they have previously designated a minimal contributing set, that set of contributors is certainly a Schelling point (Schelling, 1960) in exactly the sense surmised by the authors. More precisely, it is a built-in way to cut off negotiations, a technique whose importance is also discussed by Schelling, leaving the now-silent players to choose between 1) fulfilling their assigned roles as contributors or noncontributors; or 2) cheating, and foregoing the prize that would have been a net gain for every player. The particular structure of this experiment, not the underlying nature of the game, makes the MCS occur.

Finally, the MCS suggested by the authors as a new solution concept is nothing other than good old Nash equilibrium: when the minimal number are contributing, any defectors will cause forfeiture of the prize, and any extra contributor would just be wasting his money. This is illustrated in Table 1 (Threshold game), column 4, if...
player \(i\) is already a contributor, and column 5 if player \(i\) is not a contributor. Now there are, to be sure, two kinds of Nash equilibria in this game: the outcomes designated as MCS outcomes are distinguished by being the only Pareto-efficient Nash equilibria. In a game with extensive communication, it is quite reasonable to predict a Pareto-efficient equilibrium, if one exists.

As a final point, there is an important epistemological issue here, relating to whether or not we should alter the well-known model of human behavior peculiar to these models. Considerable work has been undertaken by economists and political scientists on public goods problems using a utility-maximizing model of participants. Does their theory require the addition of extra features, such as "role" and "reasonable behavior," in order to describe the observed behavior? This is precisely what the authors are suggesting.

The authors claim that the MCS does not require any assumption "that subjects are interested in any utility beyond that contained in the definition of the game" (p. 116). Yet the MCS does incorporate a number of confounding concepts pertaining to "role," "criticalness," and "reasonable behavior." All of these notions lie outside the analysis of choices made by utility-maximizing individuals. If these components were necessary for predicting the outcomes of the experiments, then the MCS would constitute a theoretical advance. But these concepts are in fact superfluous.

Although "role" is well defined within the experiment (as an assignment of contribution duties to an individual), it really only describes the endogenous process by which, in this experiment's structure, the standard equilibrium process is allowed to operate. "Criticalness" is presented as a means for specifying the pivotal role played by designated investors. Yet this is part of the equilibrium property built into the game—once an agreement is reached, no one has any incentive to withdraw. Finally, "reasonable behavior" is viewed as a means of foreclosing the consideration of alternative strategies—the problem of infinite regress in games of pure strategy. Purportedly, "reasonable behavior" eliminates such a regress. However, expectations of reasonable behavior in these experiments are unnecessary, since unilaterally departing from the agreement represents a self-defeating move for any participant. Consequently, these additional concepts peculiar to the MCS are extraneous, given the equilibrium properties built into the game.

Although we are not subscribing to the position that implausible assumptions ought to be retained if predictions can be derived, neither are we suggesting that assumptions can be freely manipulated without regard for antecedent work. An extensive body of work on public goods problems does exist, with well-established results (see, for example, Frohlich & Oppenheimer, 1978; Laver, 1981; Olson, 1965). If the experiment faithfully replicates that problem and yields compelling evidence that individual strategic behavior is at variance with expected behavior, then there may exist grounds for rejecting or modifying previous theoretical formulations. However, the authors provide an institutional setting at variance with public goods formulations. Further, their results correspond nicely with expected behavior by utility-maximizing participants. The secret here lies in the structural solution provided to the game by the experimenters, not in a new solution to the public goods problem.

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References

Comment on Maddox
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It was a most gratifying surprise for me to read an article that still considers worthy of attention—exactly twenty years later—my article in this Review on "Constitutionalism" (Sartori, 1962). Maddox's discussion surely enriches the debate. But is his disagreement with me as fundamental as it appears to him? I wonder. I certainly agree with Maddox's basic tenet that constitutionalism seeks to balance gubernaculum with jurisdictio, that is, an efficient exercise of power with its control. A constitution in which the controls "overpower power" simply leads to impotent government and simply attests, in my view no less than in Maddox's, to poor constitutional engineering. How about, however, a constitution that is all gubernaculum and no jurisdictio? This was and