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BRIEF COMMUNICATION

My scientific first-born: a clarification

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Abstract
A clarification of an article in praise of Professor Bezalel Peleg that appeared in this journal several years ago.

At the end of an article lauding Prof. Bezalel Peleg and his work (Aumann 2012), I wrote as follows:

"I close with an anecdote about our mathematics department—something that really happened. One year, the department was asked by the dean to suggest two people for slots that were opening up in the Faculty of Natural Sciences and Mathematics. Four serious mathematicians were candidates; so the department chairman, a renowned mathematician, called a department meeting to pick two out of the four. All were excellent, so the choice was difficult. After a long discussion, it was decided to take a vote. The chairman turned to me, and asked for advice on how to do this. I said that I'm no expert in voting theory; all I know is that there is *no* way to do it right. But if you want practical advice, I said, we do have in this room one of the world's greatest experts on voting theory, namely Prof. Bezalel Peleg. So the chairman asked Bezalel, and Bezalel suggested a method; I do not recall what it was. That method was used to select two out of the four, the meeting was closed, and we all went home.

"The next morning, I met the chairman in the corridor. He said, Yisrael, your Game Theory is terrible. I said, why do you say that? He said, not only is most of the department opposed to last night's decision, but there is even a specific pair that most of the department prefers to the one chosen. I asked, which pair, so he specified it. I said, you know what, you're right; but there is another pair (which I specified) that most of the department prefers to yours, and still another pair (which I also specified) that most of the department prefers to that one, and most of the department prefers the chosen pair to that last one. Moreover, that kind of difficulty can't be avoided; it's always possible, and indeed there's a theorem to that effect. So this renowned mathematician says, ah, you and your theorems.

"So to Bezalel I say: Bezalel, you and your theorems—keep it up!"

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Unfortunately, this was understood by a reader to say that the method proposed by Peleg at the department meeting was indeed fundamentally flawed, as the chairman had incorrectly surmised. Nothing could be further from the truth, as will now be explained.

Previously, Peleg (1978) had considered the case in which only one slot is available. Each player[1] votes by submitting a preference ordering of the candidates; to vote *sincerely* is to submit one's true ordering. A *voting rule* (a.k.a. *social choice function)* is a function that for each profile of orderings selects an outcome[2]. Peleg constructed a reasonable[3] voting rule R under which no coalition of players can—by possibly voting insincerely—guarantee (under R) an outcome that is preferred by each of its members to the outcome (under R) if all players vote sincerely.

At the meeting, Peleg suggested a voting rule P that does precisely the same thing, except that now an *outcome* is not a single candidate, but a pair. At the time, this had not been published; it was published only recently (Peleg and Peters 2017), treating the general case in which k out of m candidates must be chosen, for arbitrary m and k.

Coming back to our story, what the chairman asserted is that there is a pair y that most of the department prefers to the pair x chosen by Peleg's voting rule P. I.e., there is a coalition S with over half the players, each of whom prefers the outcome y to the outcome x. But P is not majority rule; so, that the players in S prefer y to x does not imply that S can guarantee y *under the voting rule* P. Thus the chairman's assertion does not in any way contradict the Peleg–Peters result; both are entirely correct.

Clearly, the chairman was unaware of the Condorcet Paradox (Condorcet 1785), which shows that for *every* outcome, there may be another outcome that a majority prefers. When I pointed this out, he said, "ah, you and your theorems," indicating that theorems do not impress him; and this in spite of his being a professional mathematician himself, whose work is to produce theorems. But they do impress me, and presumably the readership of this journal. So indeed I say to Bezalel, "you and your beautiful, deep, important theorems—keep up the good work!"

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[1] Department member.

[2] Single candidate to be suggested to the dean.

[3] Satisfying conditions such as anonymity and monotonicity in the sense of Maskin (1999).