A Short Response to a 'Review', with a Comment on Arrow's Impossibility Theorem

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Abstract

Voting matters published a so-called 'review' of *Voting Theory for Democracy* that is unscientific. The place where a more complete response can be found is specified. The 'review' misrepresents a new ranking-based procedure (the Borda Fixed Point procedure) and neglects the important new result that Arrow's Impossibility Theorem is either incomplete or inconsistent.

Keywords: voting theory, democracy, Borda Fixed Point, Arrow's theorem

1 Statement

Voting matters is a journal whose focus is the mechanics of voting procedures in which voters rank candidates. My book *Voting Theory for Democracy* (VTFD) (Colignatus 2011a) deals with many procedures that employ such rankings and also introduces the *Borda Fixed Point* procedure. Given the purposes of *Voting matters* it was fitting that Professor Nicolaus Tideman, the editor, accepted the idea of a review, but it is unfortunate that Schulze (2011) is not a true review because it is unscientific (see Colignatus, 2011b).

In my experience voting theorists tend to understand 99% of the standard issues in voting and not understand 1%, but for each theorist it is a different 1%, so that the literature abounds with confusion. I found it necessary to reconstruct voting theory from the bottom up and then introduce the corrections along the way. VTFD thus sets the record straight and it is the only book in the world that properly explains voting theory as of the year 2011. Routines in *Mathematica* help the new student avoid the tough mathematics and vague language that block understanding in common expositions of voting theory.

Unfortunately, again, Schulze and Tideman go off course with respect to the 1% that they do not understand. They may have been tired by the repetition of the 99% that they do understand, then failed to study sufficiently the 1%, and then dismissed VTFD as inadequate.

The only way to proceed is the scientific process. It happens that the world still has grossly non-democratic ways even in countries like the USA, UK and France (see Stavrou, 2011). Unscientific behaviour in the academic world is an important explanatory factor for this dismal situation. One might hope that more people will study the relevant arguments.

VTFD p. 3 clearly states its purpose: 'This book has two agendas: First to develop voting theory from the bottom up, referring to cheating and sensitivity to the budget. Secondly, to solve the confusions generated by Arrow's theorem.' And p. 22: 'This book allows for both beginner and advanced readers. Section 1.2 starts for beginning readers. Advanced readers would tend to start with section 1.3. If you have done the beginner chapters and have become interested in voting theory, then you should study some of the serious textbooks in the field (advised are Mueller (1989) and Sen (1970)). After that, you would benefit from section 1.3 as well.… Once you have mastered these issues, you will find the more complex Chapters 9 and 10 of the book that may require more work and some additional study using the library. This part of the book would be directly interesting for advanced students. But even if you are an advanced student, then you are still advised to work your way up, since some points

are rather subtle and easily overlooked, particularly in relation to the new programs that are presented here.'

Schulze misrepresents my new *Borda Fixed Point* procedure and desultorily calls it my 'pet theory' which seems to suggest that nobody can develop a new procedure. My novel result from treating Arrow's Theorem within deontic logic (the logic of morals), that shows that Arrow's framework is either incomplete or inconsistent, receives another desultory designation of 'mumbo-jumbo'. The 'review' makes lightning mistakes but to correct them takes tedious pages. Unfortunately Professor Tideman did not accept my full response for *Voting matters*, on the ground that such a discussion was not within its objectives. Hence I refer the reader to Colignatus (2011b) for that full response. It is somewhat curious that an unscientific article is published in a journal but the correction is not.

The editor wanted more reassurance with respect to this 'mumbo-jumbo' regarding Arrow's Impossibility Theorem, not from Schulze but from me. My report on this can be found in Colignatus (2011c). In my evaluation of Professor Tideman's approach to Arrow's Theorem I have found that he is inconsistent. This will not be printed in *Voting matters* either since the editor holds that the journal is not about Arrow's Theorem.

In an email of 25/11 Professor Tideman writes: 'I have read sections 9.1 and 9.2. I can see that there is a significant overlap between your view of Arrow and mine, but there are also vast differences.' Instead of 'mumbo-jumbo' he finds: 'I think that anyone with a background in logic or mathematics is unlikely to find your writing to be helpful to their understanding of Arrow, because of your use of idiosyncratic definitions and numerous acronyms. So it seems to me unlikely that your discussion of Arrow will have the productive impact that you hope for.'

I am sorry. These are not idiosyncrasies. Rather, they form a carefully designed didactic approach and new foundation for voting theory. The book also shows that Arrow is either incomplete or inconsistent. I have met two mathematicians who found sections 9.1 and 9.2 enlightening. I hold that the name of the axiom of 'independence of irrelevant alternatives' (AIIA) is highly misleading and that the proper name is 'pairwise decision making' (APDM). Forgive me those acronyms and look at the content, I would say. Allow me to refer also to Gamboa (2011) who reviewed another book of mine and who also had this kind of struggle but fortunately had the openness of mind to see what I intend to do when re-engineering a subject. Another review of said book plus another one is by Richard Gill (2012) and also he shows an open mind for my re-engineering of a subject. Voting theory needs re-engineering too plus an openness of mind for what that generates.

I thank Tideman and Schulze for their time on this, and in particular Professor Tideman for the greater openness of mind than I have met with from others.

2 References

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About the Author

Thomas Colignatus is the scientific name of Thomas Cool, econometrician and teacher of mathematics in Scheveningen, The Netherlands.

And yet ironically, one of the most surprising and powerful results in social choice theory, namely Kenneth Arrowâ€™s so-called Impossibility Theorem, shows that even in principle there is no coherent way to aggregate individual preferences into a collective will. In a sense, Arrow did to democracy what Kurt GÃ¶del did to the attempts to place mathematics on an axiomatic foundation.Â Before explaining Arrowâ€™s shocking result, let me set the table with a demonstration of why simple majority rule isnâ€™t a viable rule for making group decisions. Suppose Alice, Bob, and Charlie have the following subjective rankings of three candidates: murphchart.png. I am trying to prove the Arrow's Impossibility Theorem. I was searching on the internet but there is lots of different versions. I want to prove it for this statement: Arrow's Theorem: Consider a set of alternatives with at least 3 elements and assume that the number of voters is finite. Then, it cannot be established a demotratic voting system satisfying the Pareto and IIA properties. Where: Pareto: When every voter prefers A to B, the system must also prefer A to B.Â Could you give me a proof for this statement along with a simple and brief intuition? Could you include some bibliography that may be helpful? game-theory alternative-proof economics voting-theory social-choice-theory. Arrow's impossibility theorem is a social-choice paradox illustrating the impossibility of having an ideal voting structure.Â According to Arrow's impossibility theorem, in all cases where preferences are ranked, it is impossible to formulate a social ordering without violating one of the following conditions: Nondictatorship: The wishes of multiple voters should be taken into consideration. Pareto Efficiency: Unanimous individual preferences must be respected: If every voter prefers candidate A over candidate B, candidate A should win.