

# Comment: The Precautionary Principle and Judgment Aggregation

Thomas Boyer-Kassem  
MAPP, Université de Poitiers, France.  
thomas.boyer.kassem@univ-poitiers.fr

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## Abstract

In a recent paper in this Journal, Stefánsson proves some impossibility results for the Precautionary Principle. I challenge the scope of these results with reasons coming from judgment aggregation theory, a research field which studies how a group of individuals should consistently aggregate their individual opinions on interrelated judgments.

In a recent paper [1], Stefánsson proves some impossibility results for the Precautionary Principle. My comment centers around one of the premises he uses in his Propositions 2 and 3, in Section 3.2. The premise is called SAD, for Sub-Alternative Dominance, and states that, when faced with two alternatives  $P$  and  $Q$ , each having several dimensions, if on each of these dimensions you prefer the sub-alternative of  $Q$  to that of  $P$ , then you should prefer  $Q$  to  $P$  *simpliciter*. SAD is intuitively appealing — e.g. if you prefer product  $X$  to product  $Y$  on ethical considerations, and on economical considerations, then you should overall prefer  $X$  to  $Y$  —, but Stefánsson notes that some instances of SAD are not requirements of rationality — e.g. if, on each evening of the year, you prefer to have a few drinks to not to drink, while preferring to never drink to drinking on every evening. Stefánsson argues that SAD can be considered as “a general requirement of rationality” when complemented with a condition C: the relative desirability and likelihood of outcomes in the sub-alternatives should be independent of whether the whole alternative is considered or only some sub-alternative. C blocks the drinking example as it requires a form of separability between one night and the set of all nights. In this comment, I want to challenge the scope of the impossibility results which rely on this extended premise SAD+C, with reasons coming from judgment aggregation theory, a research field which studies how a group of individuals should consistently aggregate their individual opinions on interrelated judgments (for a review, see [2]).

To continue an example from Stefánsson’s, suppose an agent has to decide whether to accept the use of some chemicals, say three. In Stefánsson’s terms, the alternative is whether or not to accept the three chemicals, each chemical constitutes a dimension of the problem, and a sub-alternative is whether to accept one chemical. SAD says that, if the agent judges each chemical to be acceptable, then she should judge the set of three chemicals to be acceptable. Now consider the following hypothetical details. Suppose that, to take her decision, the agent relies on three scientific reports, labeled A, B, and C. Each report says whether each chemical is acceptable and, as a conclusion, whether the set of three chemicals is acceptable. Each report is logically consistent: it says Yes to the set just in case it says Yes to each of the chemicals. On each question, the agent goes with the majority of the reports, as given in Table 1.

Chemical	1	2	3	Set
Report A	Yes	Yes	No	No
Report B	Yes	No	Yes	No
Report C	Yes	Yes	Yes	Yes
Majority of reports	Yes	Yes	Yes	No

Table 1: Is the use of the chemical(s) acceptable? The “set” gathers the three chemicals.

There seems to be nothing insane in this hypothetical situation. And yet something strange happens: while the agent judges that each chemical is acceptable, she judges that the set of chemicals is not acceptable (cf. last line of Table 1), just like in Stefánsson’s example. This is an instance of the discursive dilemma: the majority rule, when used to decide both on the premises and the conclusion, can generate inconsistent judgments. And note that this is not because the chemicals may interact — this is excluded by condition C. What should the agent decide, then, with such reports? According to the judgment aggregation literature, there is no general answer. It depends on the desiderata, or axioms, the agent wants her decision rule to follow. For instance, if she insists on constructing her opinion step-by-step, she might adopt a premise-based rule: her opinion on each chemical is given by the majority opinion of the reports on that chemical (here: Yes for all), and her opinion on the set is logically derived from that (here: Yes too). But if she cares more about the conclusion than about the reasons, or if she wants to avoid some manipulation, she might adopt a conclusion-based procedure and determine her opinion on the set directly by the majority of the reports’ opinion on it (here: No). Then, she has two options regarding her opinion on each chemical: either not have one, and thus have incomplete judgments, or set her opinion through a (theoretically complex) reconstruction, building on the logical structure connecting dimensions and the whole problem (see for instance [3]). The main point is that one cannot consider in general that the agent has an opinion, or should have an opinion, on each chemical, i.e. on each dimension of the problem.

This challenges the scope of the impossibility results which rely on SAD+C, for two reasons. First, because SAD has an if-then structure, in case the agent does not have opinions on the dimensions of the alternatives, the “if” part is not fulfilled, and SAD does not trigger. As Stefánsson’s proofs of Propositions 2 and 3 implicitly require the fulfillment of that “if” part, the impossibility results cannot be established in general. Second, condition C is not satisfied in general, because (i) it implicitly assumes that the agent has opinions on the dimensions of the alternatives, which is not always the case, and (ii) the agent’s opinions on the dimensions may be reconstructed from the whole problem, thus violating the independence condition. In sum, judgment aggregation theory provides some theoretical reasons why SAD+C is not satisfied in general, and why the Precautionary Principle is out of reach of Stefánsson’s impossibility results. The interpretation of these results, thus, is not that the Precautionary Principle should be abandoned because it conflicts with local and global views on alternatives, but instead that one can abandon or modify these views, and keep the Precautionary Principle. More generally, the judgment aggregation literature reminds us that the delineation of the problem — do we only consider this dimension, or that one, or all of them? — is crucial, since considering several problems independently or the whole problem at once may lead to different decisions (cf. for instance [4]). So, I agree with Stefánsson that this has “the practically unfortunate implication that complex global decision-problems cannot safely be broken down into more manageable units”. But this may be for good, theoretical reasons — breaking down problems is not always the golden procedure.

Overall, I have only argued that the scope of the impossibility results in [1] which involve SAD+C is narrower than implicitly considered by Stefánsson. Future work should specify exactly which cases, either theoretical or concrete, are covered or excluded.

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## References

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