

## Anonymous Referee #1:

Firstly, we would like to thank you for the numerous helpful comments and suggestions you have made on our manuscript. It was indeed challenging in places.

This is a very interesting work that combines a challenging literature review with some results. I say "challenging" because the topic (tipping in social networks) demands several expertises that can be quite far from each other. Network science and social network analysis, dynamical systems (phase transitions, non-linear dynamics, etc.), socio-ecological systems, simulation, data analysis, and so on.

The manuscript makes a good job at introducing the core concepts needed for such discussion, and the effort to integrate all those, coming from different disciplines, is generally successful: someone unfamiliar with social networks, information cascades, etc. will achieve a sufficient understanding of the research problem.

Beyond this general positive impression, the manuscript suffers from some shortcomings that should be addressed. In some sense, these weaknesses are "technical" (writing style, typos), but they end up affecting the message, and not only the form. For example, we can find some sentences which are unfinished or out of context (example: line 210: "Although in the former it is the spread of cooperation.". It makes reference to the previous text, but this sentence ill-formed: it reads as if something had to follow after 'cooperation'. Yet another example (line 260): "An example is reducing" (the sentence is unfinished, it simply ends there).

We completely agree that in general there are numerous "technical" weaknesses throughout the manuscript that require refinement. With full disclosure, we were under some time constraints due to the Global Tipping Points report due to be published and the manuscript polish did suffer. We apologize if these errors added difficulties in reading the manuscript and plan to rectify these systemically in an updated manuscript. For example, the line in 210 will be removed and the lines in the previous sentence will be updated to the effect of "...the magnitude and rate of contagion(cooperation in the former) spread.". Sentences such as the example from line 260 will naturally be removed. There is also duplicates of some table entries e.g. in Table 3 which will be removed.

I am aware that these are easy-to-solve issues. There are more (perhaps not so obvious). My point is that such formal errors interfere with the smoothness of the text --which needs to be really smooth if meant as a review for scholars from other disciplines. These errors (and many other smaller ones) suggest that the text was written with some hastiness.

Again, we agree with the comments and the importance of readability in a review article. Amongst addressing redundancies, repetitions and typographical errors, we plan to streamline and condense the amount of text in general, especially in section 2. Which addresses the first part of your comment below.

A second indication of hastiness is the fact that some paragraphs are redundant (they can be some pages apart). I think that the concept of "threshold" is a good illustration of this: both their macro and individual dimensions keep appearing in different places, and so such a central concept is at risk of becoming "fuzzy" (except for the explicit and clear definitions in Box 1). My suggestion is then to reconsider the style and organization, specially in Sec. 2, to optimize the pedagogical value of the work.

If you are referring to examples such as (line 185) "An important distinction regarding thresholds is to be made between the system level macroscopic tipping threshold and individual agent thresholds, or threshold fractions.", where the "individual agent threshold" may confuse or add to this fuzziness, we acknowledge this and plan to remove potentially confusing or superfluous definitions.

I recommend caution as well when using certain words. In Box 1, we see "percolation" and "spreading" as equivalent (verbatim: "[...] which after a percolation (spreading) process must occupy [...]". Although percolation is behind the study of contagion-like processes on networks (disease, information), it has a wider meaning in network science and statistical physics.

We agree, in Watts (2002), he refers to percolation models of (disease) spreading as belonging to "a larger class of contagion problems". Based on this interpretation, percolation would not have equivalence with spreading but rather be a subclass of a contagion process. The 'spreading' was added as an aid to interdisciplinary or non-specialist readers. We will either add a footnote in the box which explains the term and its context or remove it and add information on percolation in another section of 2.1.

For the sake of transparency and reproducibility, details about data collection (Sec. 3.1) should be more precise. The literature search must have for sure returned hundreds, if not thousands, of titles. How then the authors reached an initial number of 33?

There are certainly a few errors in this section. For example, in line 374 we say that the literature considered for the first 3 stages is  $N = 41$ , when it should in fact be  $N = 39$ . The data collection section is also missing information which has led to the confusion you mention. Firstly, we only looked at the first 4 pages of google scholar results. Secondly the search string ""network" \*, "networks"\* AND ("complex contagion" OR "norm diffusion")," is left over from an earlier draft and this search was not used. Thirdly, we only selected articles which, along with the other existing criteria, only referred to social contagion between people. These things will be amended and should provide a better template to reproduce the literature search used in the manuscript. We also plan to include a figure detailing the filtering process of literature in each stage 1, 2, and 3.

To sum up, the value of a document like this lies in its clarity. Precisely because the scientific content of the manuscript is very appealing, the effort to communicate it must be equated.

We wholeheartedly agree. As mentioned in these replies, we will systemically update the manuscript to remove technical errors such as those mentioned above and focus on clarity of

concepts. Key attention will be given to reducing “fuzziness” in terms or notions and removing redundant or multiple definitions where possible.

Finally, other minor issues to take into account:

- The "Clustered lattice" representation in Fig. 2 is very counterintuitive. I am sure a better representation is possible.

This will be updated to a standard representation where the lattice is in a circular formation.

- Table 1: Erdős-Rényi networks have a low average path length.

This will be corrected.

- Figure 3: please add labels to x- and y-axis

They are indeed missing and will be added.

- Please revise the references format. One can find, e.g., "PNAS", "Proceedings of the National Academy of Sciences"; missing publication years; etc.

We will go through the references to ensure they are correct.

## References

Watts, D. J.: A simple model of global cascades on random networks, Proc. Natl. Acad. Sci., 99, 5766–5771, <https://doi.org/10.1073/pnas.082090499>, 2002.