

Peer-review report of

Stanghellini, F., Perinelli, E., Lombardi, L., & Stella, M. (2024). Introducing semantic loadings in factor analysis: Bridging network psychometrics and cognitive networks for understanding depression, anxiety and stress. *advances.in/psychology*, 2, e35366. <https://doi.org/10.56296/aip00008>

Round 1

Dear authors,

The reviewer, who specializes in network science and psychometrics, aims for a comprehensive review of the manuscript, organized by sections and labeled as 'Edit,' 'Minor,' and 'Major' comments. They express enthusiasm for the paper and provide several suggestions for improvement:

1. Introduction: The reviewer suggests including Rosenbusch et al. (2020) to enhance readers' awareness of tools in psychometrics and semantics.
2. Methods:
 - Clarification is needed for the acronym TMFG, with a recommendation to cite Massara et al. (2016) and Golino et al. (2020).
 - They advise citing Epskamp and Fried (2018) for the GLASSO implementation.
 - The reviewer notes that {EGAnet} has been updated since submission, suggesting the authors ensure reproducibility with the update.
 - A suggestion is made to explore weighted topological overlap (wTO) and the O-information metric for closer congruence to semantic factors, citing Christensen et al. (2023) and Marinazzo et al. (2022).
3. Results: The reviewer points out the apparent use of Bootstrap Exploratory Graph Analysis in Figure 2 and advises proper citation (Christensen & Golino, 2021), recommending more iterations for better inference.
4. Discussion: They propose a data split (e.g., 70/30% train/test) to assess the generalizability of semantic factors/loadings with network factors, acknowledging that this may be post-hoc.
5. General Comments: The reviewer compliments the readability of the paper and urges the authors to ensure proper citation throughout, especially in areas related to the reviewer's own work.
6. Transparency Statement: The reviewer acknowledges their own citations in the review and clarifies that these are not mandatory for publication but are meant to improve the manuscript. They affirm the worthiness of the manuscript for publication regardless of these inclusions.

I have also revised the manuscript, and agree with the reviewer's suggestions. I urge the authors to revise the manuscript addressing all points raised by the reviewer.

Best wishes,

Hudson Golino

Reviewer 1

Review Statement

As a reviewer, I have expertise in network analysis and psychometrics. Based on my experience and the content of the manuscript, my review aims to be comprehensive.

My review is ordered by section as they appear in the manuscript. My comments are labeled Edit, Minor, and Major for what I see as revisions to the manuscript. The editor, other reviewers, and authors may disagree.

Having a foot in both network psychometrics and cognitive networks, I want to let the authors know that I greatly looked forward to reading and reviewing this paper and can say without reservation that I enjoyed their composition. I have several comments aimed at improving the manuscript for publication.

Review

Introduction

Minor: I believe the authors should include some mention of the Rosenbusch and colleagues' (2020) contribution of the semantic scale network to detect semantic overlap in psychological scales. Although I view the work as tangential to what the authors present, I believe this work increases the readers' awareness of the tools available for psychometrics and semantics.

Rosenbusch, H., Wanders, F., & Pit, I. L. (2020). The Semantic Scale Network: An online tool to detect semantic overlap of psychological scales and prevent scale redundancies. *Psychological Methods*, 25(3), 380.

<https://doi.org/10.1037/met0000244>

Methods

Minor: When discussing EGA on page 12 the authors mention TMFG without mention of what the acronym refers to. The authors should refer to the algorithm in full and probably cite Massara et al. (2016) and Golino et al. (2020) as relevant papers for the TMFG and EGA with TMFG in this context, respectively.

Golino, H., Shi, D., Christensen, A. P., Garrido, L. E., Nieto, M. D., Sadana, R., Thiyagarajan, J. A., & Martinez-Molina, A. (2020). Investigating the performance of

exploratory graph analysis and traditional techniques to identify the number of latent factors: A simulation and tutorial. *Psychological Methods*, 25(3), 292–320.
<https://doi.org/10.1037/met0000255>

Massara, G. P., Di Matteo, T., & Aste, T. (2016). Network filtering for big data: Triangulated maximally filtered graph. *Journal of Complex Networks*, 5(2), 161–178.
<https://doi.org/10.1093/comnet/cnw015>

Minor: Similarly, the GLASSO implementation should be cited with Epskamp and Fried (2018)

Epskamp, S., & Fried, E. I. (2018). A tutorial on regularized partial correlation networks. *Psychological Methods*, 23(4), 617–634.
<https://doi.org/10.1037/met0000167>

Minor: {EGAnet} has since been radically updated since submission so it would be important for the authors to ensure their analyses are reproducible with the update (it should be)

Minor: One thought that occurred to me when reading through how the semantic and network factors would be compared was whether something like weighted topological overlap (wTO) might reach even closer congruence to the semantic factors. Specifically, Christensen et al. (2023) introduced such an approach as “Unique Variable Analysis” to identify local dependence (or redundancy) of variables in a network. Often, these redundancies are due to semantic overlap in items. Perhaps beyond the scope of the authors manuscript but if applied I imagine that wTO would increase the correspondence (Jaccard Index) between the semantic and network factors. Similarly, I wonder whether the redundancy found by the O-information metric introduced by Marinazzo et al. (2022) would also have relevance here.

Christensen, A. P., Garrido, L. E., & Golino, H. (2023). Unique variable analysis: A network psychometrics method to detect local dependence. *Multivariate Behavioral Research*, 1–18. <https://doi.org/10.1080/00273171.2023.2194606>

Marinazzo, D., Van Roozendaal, J., Rosas, F. E., Stella, M., Comolatti, R., Colenbier, N., ... & Rosseel, Y. (2022). An information-theoretic approach to hypergraph psychometrics. *arXiv preprint arXiv:2205.01035*.

Results

Minor: Based on Figure 2 and some description in the Results (p. 21), it appears that Bootstrap Exploratory Graph Analysis was applied. If so, proper citation should be given:

Christensen, A. P., & Golino, H. (2021). Estimating the stability of psychological

dimensions via bootstrap exploratory graph analysis: A Monte Carlo simulation and tutorial. *Psych*, 3(3), 479–500. <https://doi.org/10.3390/psych3030032>

I would also recommend more than 50 iterations of the approach (around 500 is generally acceptable and provides good inference).

Discussion

Minor: A point realized in the Discussion but more directly relates to the Results: Given the massive dataset, would it be possible to do some sort of data split (e.g., 70/30% train/test) on the data to assess the generalizability of the semantic factors/loadings with the network factors? I recognize this data split would come post-hoc as the authors have already developed their method and presented their results; however, I believe such demonstration of generalizability would further demonstrate the robustness of the results. In my reading, this suggestion may not be possible as the semantic loadings are derived directly from the items' words themselves but perhaps the network factors could be done as this split and the results of the semantic loadings could be compared with the splits.

General Comments

The paper reads very well and was easy to follow — bravo!

I have caught a few places (specifically related to my own work) where proper citation should be provided. Places related to my work were most salient but I do not assume that this lack of citation is specific to me, so I encourage the authors to read over their manuscript carefully to look for places where they might have missed citing work. I do not believe the authors have missed work intentionally but I do want to encourage giving credit where credit is due.

Transparency Statement

Given that I have provided several citations in which I am either the first author or co-author, I want to acknowledge that these citations are not required for the authors to include for publication of their manuscript. I recognize that recommending self-citations in a review can be tacky and self-aggrandizing. I in no way intend for these recommendations to be the case. I believe that manuscript is worth publication regardless.

Signed,

Alexander Christensen

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Round 2

Dear Dr. Stanghellini, Dr. Perinelli, Dr. Lombardi, and Dr. Stella.

It is my pleasure to inform that your paper titled “Introducing semantic loadings: Bridging cognitive network science with network psychometrics for understanding depression, anxiety and stress” has been accepted for publication at our journal.

Thank you for collaborating with our special issue on network psychometrics.

I'm looking forward to seeing your paper published as soon as possible.

Best wishes,

Hudson Golino

Reviewer 1

The authors have thoroughly addressed all comments in my previous review.