Pre-analysis guidelines for data exclusion and transformation

Limitations in data sets

Our social network analysis is based on the responses that each of the team members give to questions about who else in the team they communicated most with, second most and third most, and who they relied most on, second most and third most. However, upon data entry of raw data and preparing for social network analysis, we realized that our data had the following limitations (mainly for Experiment 1):

- In Experiment 1, the response format (pen and paper survey) did not restrict participants from ranking the same function twice, e.g. as being both the person they communicated most with, and the person they communicated second most with. It is unclear what the participant means with such responses, and they do not fit our intended plan for scoring the responses.
- In both experiments, respondents were able to state their own team function as an answer to the questions. This may be due to participants misunderstanding the question, interpreting it differently than we intended, or making a mistakes in responding. Such responses are difficult to fit into our expected social network.
- In Experiment 1, participants could leave one or more response options blank, e. g. ranking only one or two of the top three functions for communication/reliance.
- In real events, teams sometimes bring in an additional personnel coordinator (PK) or marine vessel coordinator (SM), as those particular functions' work load may require two people. In some cases in Experiment 1, two individuals representing the same function attended a data collection. In such instances, the permanent team member was labeled "PK1" or "SM1", and supplementary individuals were labeled "PK2" or "SM2". However, the assignments into "1" and "2" may not have been clearly agreed upon and known to all team members, as the results indicate inconsistencies in how the assignations were used. As each node in the networks were meant to represent a specific team function, double ratings to or from any given node could lead to a skewed network. The "double" nodes would likely be depicted as highly central and thus, influential, as a result of being able to rate and be rated twice as many times as team functions represented by only one individual.

Guidelines for data exclusion and data transformations

To correct for the limitations in the data mentioned above, we made the following adjustments, some of which were not anticipated in the pre-registration. The adjustments were decided on during data entry, before social network analyses were calculated and before results were compared to shared mental model and situation awareness results.

1. As described in the pre-registration, if a participant had missed ranking some of the higher levels of a question (e.g. "communicated with the most"), but filled out some of the lower levels (e.g. communicated with second most"), the lower levels would be moved up to take the place of the missing value.
2. All ratings reporting PK1, PK2, SM1 or SM2 were rescored to remove the number, thus identifying a function in the team rather than a team member.
3. In teams with responses from two individuals filling the same function, the data was reduced to have the same input to the network as if it had come from a single member (i.e. just three "communication" ratings and three "relying" ratings. Participants who had identified themselves as being primary in this function (i.e. PK1 or SM1) was given priority, and this

member's ratings were used rather than the participant identifying themselves as being second (i. e. PK2 or SM2).

4. Following from the above point, in instances where rankings from PK1 or SM1 were missing, the rankings of PK2 or SM2 were inserted into the analyses, according to the original ranking order. For instance, if a PK1 had ranked only one other team function, and this was ranked in third place, that response was moved up to first place, and the rankings of PK2 would be inserted in second and third place after PK1's ranking.

5. In some cases, two individuals filling the same function rated each other (i.e. PK1 and PK2 rated each other, or SM1 and SM2 rated each other). Such rankings were excluded from the analysis, and the function listed next in the ranking was moved up to that place. The same exclusion criterium was applied for other team functions, in the rare cases where a team member had ranked him-or herself as one of those they communicated with or relied on.

We will provide a list of all the cases in which data were excluded or transformed based on the above criteria.