METACONFERENCING POSSIBILITIES

Anthony J.N. Judge

1. Introduction

This document describes investigations subsequent to the article « Metaconferencing » (Transnational Associations, 1980. 8). In that article it was suggested that on-line terminal access to computer facilities from a conference site could open up an entirely new approach to the conference process. The first part of this document outlines, in the light of discussions with an international computer time-sharing service (CEGOS-TYMSHARE), specific possibilities which are described in more detail in the second part of the document. This also includes examples of results and the computer instructions used to obtain them during the course of the World Forum of Transnational Associations (Brussels, 1980).

2. Participant questionnaires

A series of questionnaires to participants based on selected viewpoints, is planned. The first is included here and is self-explanatory. It is received by the participants in their registration folders.

3. Data input from questionnaires

For the first round, the questionnaires are sent to CEGOS-TYMSHARE after the first morning session. The responses are typed into a computer storage file with the indication of participant name/pseudonym. The advantages of doing this off-line are speed and reduction in risk of errors. There is no limit to the number of participants or questions.

4. Conceptual distance separating participants or viewpoints

The data is processed using a standard **factor** analysis routine. There are practical limitations on the number of participant responses that this routine can reasonably handle. These are primarily cost limitations because of the non-linear increase in processing time required as the number increases. Thus for 100 participants answering 30 questions each the cost is of the order of 2.000- Belgian Francs ($ 65.00) for 3.000 elements. This is the major cost factor.

5. Plot of graphical display (« map »)

Only a few instructions are required to get the terminal to print out a graphical display. Because of the complexity of the calculation, the results can only be considered a simplification in two-dimensions of a many-dimensional situation. However, compared with the conventional one-dimensional meeting agenda of a series of poorly related items, this is already a major step forward. There are a number of possibilities.

5.1. All participants

In this form all participant names (or pseudonyms) are printed out on an area of specified dimensions (Document 1). The names are positioned so as to reflect the « distance » between the participants in the light of the degree of difference between their responses.

5.2. All viewpoints

In this form the number of each statement in the « questionnaire » is printed out on an area of specified dimensions in a manner similar to that for the participant names. The identifying numbers are positioned so as to reflect the « distance » between the viewpoints as perceived by the participants.

5.3. Partial maps

There may be several reasons for producing portions of either of the above complete maps :

(a) Points on the display may be crowded on top of each other so that they cannot be distinguished.

(b) Paper width on the terminal maybe too narrow, such as to cause crowding as in (a).

(c) Detailed maps may be required, around a given participant or viewpoint, for example.

Partial maps are then produced, using an appropriate scale (These can be attached together with adhesive tape if desired).

6. Clusters of participants or viewpoints

As a possible alternative or complement to factor analysis (point 4 above), a different routine may be used to create categories.

6.1. Participants

In this case, the number of categories into which the participants are to be grouped is specified (e.g. 5). As a result the names are clustered into those (5) categories according to an assessment of the degree of difference between the participants in the light of this response to the viewpoints.

6.2. Viewpoints

An analogous procedure is adopted to that for participants. The clusters provide an indication of the relatedness between viewpoints as perceived by participants - namely how they would tend to group them for a given number of categories. In both cases the computer in fact calculates which cluster a participant or viewpoint belongs to when the total number of categories is 1. 2. 3, 4, etc. The resulting list, for a given choice, is therefore a column selected from this table (which may be used for later calculations).

7. Proximity lists

On the basis of the factor analysis (point 4 above), lists may be established in relation to individual participants or viewpoints. With a few additional intructions, this may be done systematically for all of them.

7.1 Participants

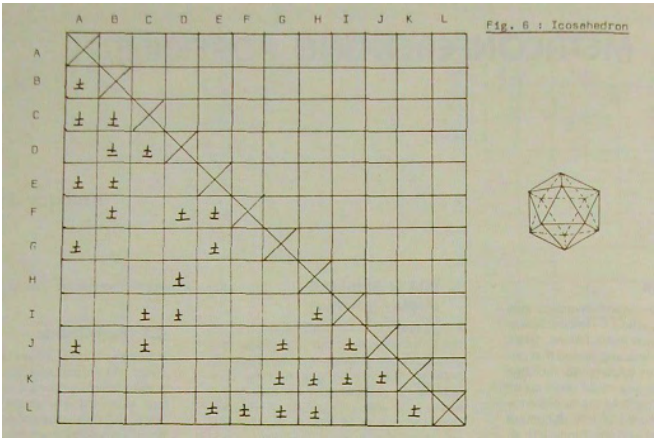
For a given participant lists may be printed out of

(a) Names of a selected number of other participants who are closest to him in terms of an absolute measure of distance between them defined by the difference between their viewpoints responses.

(b) Names of a selected number of other participants most distant from him.

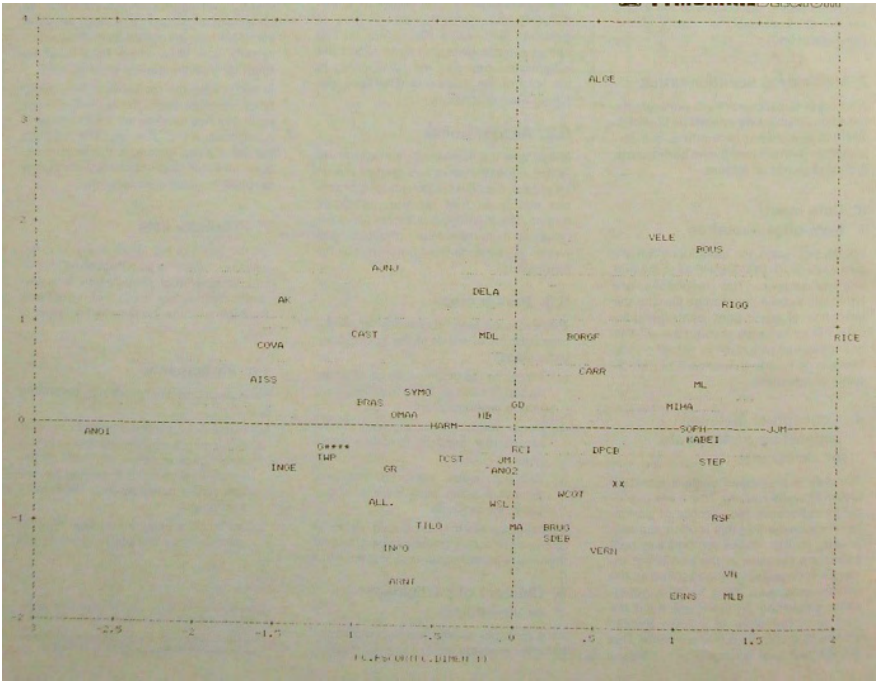
(*) Prepared on the occasion of the World Forum of International/Transnational Associations, Brussels. 1980.

An introduction to this technique appeared in **Transnational Associations,** 1980, 10, p. 411-420.



PARTICIPANTS

Document 1 - Map of the « distances » between participants on the basis of a computer analysis of their responses to the first round of a questionnaire (the map represents one « slice » through the 3-D space within which the results were represented).



7.2. Viewpoints

Similarly for a given viewpoints, lists may be printed out of

(a) Viewpoints closest to the given viewpoint, as perceived by participants.

(b) Viewpoints most distant from a given viewpoint.

Note that because this is based on an absolute measure of distance it conveys more information than the plotted graph (map) of point 5 which is merely a projection.

8. Global measures of distance

8.1. Average for participants

The average distance between all participants may be computed from which lists may be established of

(a) Participants who are « closer » together than the average (« the central clique »).

(b) Participants who are more « isolated » than the average.

These lists may be refined by narrowing the parameters.

8.2. Average for viewpoints

A similar procedure may be adopted for viewpoints, namely the « core » and « isolated » viewpoints.

8.3. Standard deviation for participants

The standard deviation of the distance between participants may be computed as an indication of the level of disagreement between them.

8.4. Standard deviation for viewpoints

A similar procedure may be adopted for viewpoints as an indication of the level of « incompatibility » between them.

9. Detailed analysis of responses

Tables may be easily produced giving the responses by participant to viewpoint statements with an analysis of these.

10. Comparison between successive rounds

All the above can be based on responses to one questionnaire. If a second questionnaire is subsequently used the responses may be analyzed in the same way. It is however useful to examine ways in which participant opinions appear to have shifted from one round to the other. This may be done as follows :

10.1 Based on factor analysis results (distance)

The change in the distance between any two pairs of participants may be computed. Whilst this may be easily done for any given participant pair, time/cost constraints appear once this is done for all participants in cases when these exceed about 500-1000.

10.2 Based on cluster analysis results (groups)

Using the tables (see point 6 above), an analysis may be made of the change in the way each participant is grouped in the case of 1, 2, 3, 4, etc. categories.

11. Configuration possibilities

The results indicated above enable participants to get some impression of how the conference as a whole may be analysed. This may suggest actions which individuals could take individually or collectively. A further step may be envisaged, at least as an experiment. The question is whether it is possible to use the questionnaire information to recommend configurations of participants for dialogue or group discussion.

A first step in this direction is the indication of the participants who are closest to one another (as was described above). If however it is assumed that participants benefit more from discussion with those who are most dissimilar, this possibility was also described above. A more useful refinement may be that participants would benefit most from discussing with others who represent a compromise between those two extremes namely :

- not too similar, and
- not too different.

This assumes that this would provide sufficient « common ground » and sufficient stimulating « differences of opinion ».

11.1. «Doubles»

The results may be used to indicate, for each participant, other participants for whom :

- roughly 50 % of the responses are very similar
- roughly 50 % of the responses are very different.

11.2. «Triples»

The analysis may be extended to cover groups of 3 people who have a similar overlap of shared and divergent opinions.

11.3. Groups

Clearly the analysis may also be extended to recommend the creation of groups with a balance of divergent and shared opinions. Note however that, especially for groups of more than 3, there are two possible approaches to this analysis :

(a) Same opinions strongly held by all group members. In this case it is only the strong differences of opinion between pairs of group members which vary from pair to pair.

(b) Both shared opinions and differences in opinion vary from pair to pair amongst the group members. Groups of type (a) can lose a member without affecting the basic consensus linking all members together - although some members may thereby lose the stimulus of disagreement. Groups of type (b) are more fragile because each member is essential to the viability of the whole. Much greater diversity is possible in such groups.

11.4. Stabilized groups

The groups of type (b) above are derived from an essentially dualistic analysis of patterns of similarities and differences of opinion. By extending the analysis to locate somewhat more complex patterns, a new type of high diversity may be found which is not as vulnerable as the type (b) group. These are the tensegrity groups described in the previous metaconferencing paper.

The following remarks indicate a direction for exploration only. They require further refinement before making use of the computer analysis which can be easily adapted to them.

(a) A simple type (b) situation is illustrated in Fig. 1 (The matrix would be held by computer). The combination of two people, A and B, answering two questions. 1 and 2, such that they agree strongly (+) on 1 and disagree strongly {-) on 2, may be represented more compactly as in Fig. 2. Already it would be interesting to investigate groups of this kind. But the longer the « chain ». the greater the probability that it would be unstable and unmeaningful to those in it. A second chain might however be present (dotted) to increase its integrity. And perhaps other patterning features could be present which could be detected by computer in order to recommend the creation of such a group within a larger conference (of questionnaire respondents).

The issue is whether it is possible to detect more interesting patterns which would signal the possibility of more interesting groups. The tensegrity structures all involve 3-dimensional patterns but it is not clear how these might be detected in a 2-dimensional matrix.

(b) Consider the simplest example of a tetrahedral pattern. This may be represented in Fig. 3 when the intersection of A and C for example means as in Fig. 2 that A/C are - bound » together by agreement (+) and disagreement (-) on one or more questions. (Such pairs could be easily selected out of the larger matrix of respondents). Note that all cells below the diagonal are filled - this is definitely a minimum condition.

(c) The next most complex form (in the Platonic series) is the octahedron. This is one of the two principal forms important tor tensegrity patterns. This may be represented in Fig. 4. Note that there are now empty cells below the diagonal and that these form a line - namely a detectable pattern. Note also, however, that this line could equally well have been parallel to the diagonal if the points on the octahedron had been lettered in a different order. But it would still be a line. (The line derives from the missing links across the empty centre of the octahedron - the cells constituting it reflect the axes of symmetry of the form.)

(d) In Fig. 5, the matrix for another (of the 5 Platonic) forms is given, namely the cube. Note that the cube is not suitable as a basis for tensegrities since it is unstable unless the faces are triangulated. This instability may be said to be reflected in the proportion of unfilled cells in the matrix.

(e) In Fig. 6, the matrix for the other principal form (also Platonic) which is important for tensegrity patients, namely the icosahedron. There is greater order in this matrix than is immediately evident and this can be brought out by (computer) reordering of the rows and columns. The disorder results from the arbitrary lettering of the form.

(f) There is a progressive increase in the proportion of unfilled cells from Fig. 3 to Fig. 6 (excluding Fig. 5). In fact by omitting one further intersection from each row/column of Fig. 6 the pattern of another form, the cuboctahedron, is obtained. This may also be used for a tensegrity.

(g) As a final example, showing how a basic form such as the octahedron gives rise to more complex patterns, consider the 2-frequency octahedron in Fig. 7.

What these patterns seem to signify are the conditions of equilibrum for minimal bonding requirement. In other words they indicate the most complex groups that can be created with minimal consensus. Returning to the questions represented in the matrices of Fig. 1 and 2, these could be conceived as forming a third dimension with the matrices of Figs. 3 to 7. This opens up interesting possibilities for analysis and pattern recognition, but much further reflection is required for designing computer routines to make use of it. (Further study may benefit from the Japanese discipline of « go », which is specifically concerned with the elegance of the evolving balance between opposing patterns).

Clearly in the first round of a metaconference the selection of questions may not distinguish sufficiently strongly between the participants. They may not give the opportunity for **strong** and variegated patterns of agreement/disagreement bonds between participants. A means is required to discover for later rounds, more fundamental questions which polarize the participants more strongly, but in a variety of ways.

A « highly tuned » conference would thus be one in which there was :

- profound polarization on many issues
- equivalent agreement on other issues
- an appropriately variegated pattern so that the network of agreement contained the polarization, and the polarization enriched the agreement (namely much more than a simple division into opposing camps).

12. Conclusion

There are clearly many possibilities of which the value and constraints can only be determined in practice. But other opportunities will be required to push the analysis further as indicated in point 11.4 (above).

In response to the question « why produce such documents » one could imagine that the ideal conference centre of the future - modifying the motto of the oracle at Delphi - might bear the following phrase over its doors : « Conference : Know Thyself ». Such documents contribute to that end

The computer-assisted search either for questions which could move a conference into a highly-tuned condition, or for groups of participants which could function in such a condition, may appear time-consuming and not worth the effort. However, if the metaphor can be forgiven, it is rather like mining for gold. But it is worth the effort. Or, with a slightly different metaphor, it is a question of locating diamonds in dross, the most valuable being those of the largest number of carats. Such are the patterns which it seems could be discovered with a new approach to conferences.

Fig. 7 : 2-frequency Octahedron