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Studying Participants' Experiences Using Concept Mapping

There appears to be a shift in the current Zeitgeist in educational research. Researchers are finding themselves excited by moving more fully toward studying participants' experience of change, be it solving math problems in the classroom or solving personal problems in counselling. *Concept mapping* is a participant-based methodology that combines qualitative and quantitative research strategies and actively involves research participants in generating items and gathering data (Trochim, 1989, 1993). It is a method that is particularly appropriate for studying participants' experiences (Paulson, Truscott, & Stuart, 1999). Procedurally, concept mapping involves three basic processes: (a) generation of ideas, thoughts, or experiences by participants about a specific question or self-report; (b) grouping together the ideas, thoughts, or experiences through an unstructured card sort of the participants; and (c) statistical analysis of the card sort results using multidimensional scaling and cluster analysis (Borgen & Barnett, 1987; Davison, Richards, & Rounds, 1986; Rosenberg & Kim, 1975).

Given that the meaning units are sorted by the participants, investigator bias is reduced in contrast to qualitative data that is interpreted by one or more investigators. Bias is further reduced through statistical analysis of the participant-determined sortings, making it unnecessary for either the participants or the investigators to specify any of the dimensions or attributes in the sorting of the data.

Gathering Data

Two data-gathering sessions are required for concept mapping. In the first, participants are asked to respond to an open-ended probe designed to elicit their perspectives on their experience without overly constraining their response. The number of participants needed will depend on the experience

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under study, with the goal being to identify the essence and variety of participants' experiences. Participants' responses are typically audiorecorded and transcribed, although other recording methods can be used. Participants' responses are then analyzed to distill an inclusive set of statements that capture the meaning of their experience while retaining their language.

In the second data-gathering session approximately 20 participants return for a sorting task in which each of the statements derived as described above is printed on a card; each card represents one qualitative description. Participants are asked to place the cards in piles according to "how they seem to go together." No restrictions are placed on participants' sorting strategies other than that they not place each item card alone or place all cards in one pile.

Analysis and Interpretation of Data

A nonmetric multidimensional scaling (MDS) procedure is performed on the data from the sorting task. MDS arranges points representing items along orthogonal axes such that the distance between any two points reflects the frequency with which the items were sorted together, making it especially suitable for spatially representing unknown latent relationships among variables (Fitzgerald & Hubert, 1987; Kruskal & Wish, 1978). The relative position of the points from one another is derived from the MDS solution and reflects the frequency with which the statements were sorted together by participants; points that are closer together represent statements that were more frequently sorted together than were statements represented by points farther apart.

Hierarchical cluster analysis of the MDS similarity matrix is then used to group sorted items into internally consistent clusters, this cluster solution being superimposed on the MDS point plot (Borgen & Barnett, 1987; Ward, 1963). The cluster boundaries around groups of points represent statements that were more frequently sorted together in the same pile and less often sorted with statements in other piles. Because the cluster solution is based on estimated distances between items from the MDS two-dimensional solution, the cluster solution is used as a secondary guide to interpreting the map, with the MDS solution (i.e., the relative distance and position of items on the map) given primary consideration.

A descriptive and justifiable name for each of the clusters of MDS items is next made on the basis of inspection of the constituent items, inspection of those items contributing most to the uniqueness of each cluster, and relative distance of each item from other items on the map. As with other procedures, such as factor analysis, naming of clusters is both statistically and conceptually influenced.

Interpretation of the concept map involves informed conjecture about the possible structure participants imposed on the statements in their sorting by identifying implicit dimensional axes around which statements may be configured (Buser, 1989), inspection of the placement and adjacency of statements and clusters to identify apparent regions of the map and potentially related concepts, and placement and adjacency of clusters.

Research Example

To date we have conducted several research studies using concept mapping. Our current study is investigating what clients perceive as unhelpful in coun-

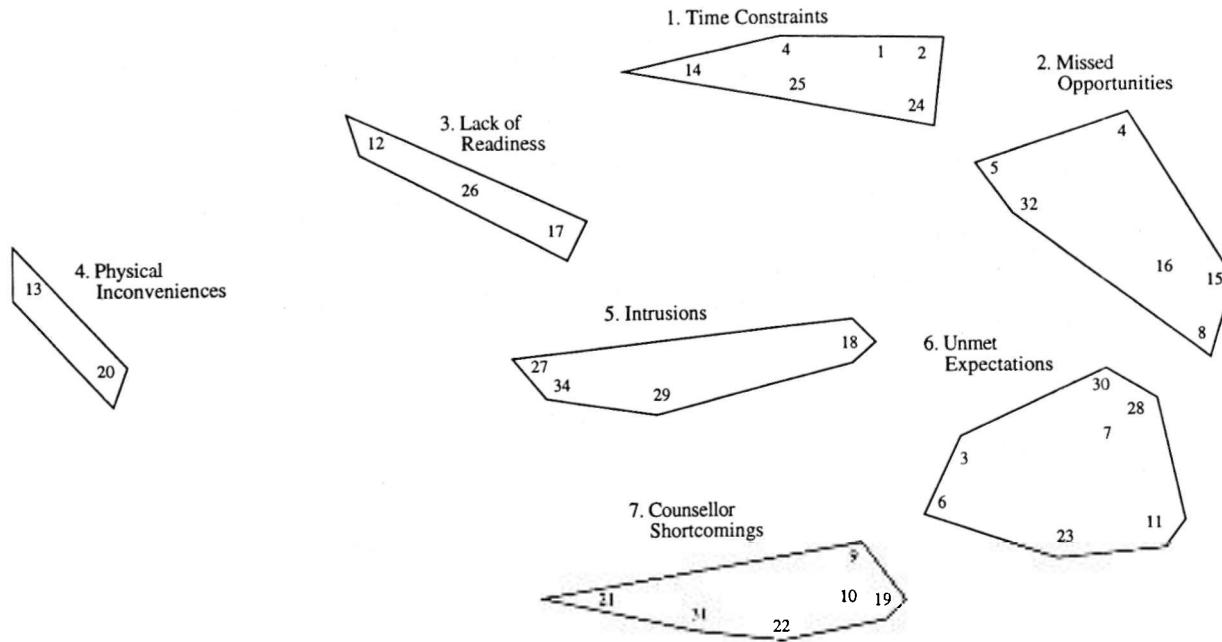


Figure 1. Concept map of 36 elements of what 35 clients found unhelpful in counselling derived from qualitative analysis of their response to the probes "What wasn't helpful about counselling?" and "What would have made counselling more helpful?" based on multidimensional scaling and cluster analysis of 19 clients' open-card sort of these elements.

selling by examining the retrospective experience of 35 clients who had completed counselling after an average of 11 sessions. In the preliminary study participants were interviewed by telephone. The responses we received during the telephone interviews led us to believe that the participants were reluctant to report negative counselling experiences. Although seven thematic clusters were identified—Time Constraints, Missed Opportunities, Lack of Readiness, Physical Inconveniences, Intrusions, Unmet Expectations, and Counselor Shortcomings—the research team concluded that participants' responses were incomplete. We are, therefore, in the process of collecting additional data via in-depth individual interviews in order to refine the original concept map with the goal of deepening our understand of this important process.

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