

METHODS BRIEFING 29

Interactive Data Collection-Reproduction/ Transmission of Environmental Knowledge

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Background

Anthropologists employ interactive methods of collecting and analysing field data, often referred to as the ethnographic method. Ethnographic methods includes unstructured and semi-structured interviews, systematic surveys, participant observation of cultural activities and social interactions, reiterative evaluation of researcher's methods and results by local people, and elicitation using audio, video and photographic recordings.

Research Context

The main ethnographic focus of our research was a comparative analysis of environmental knowledge creation, transmission and reproduction. Knowledge in this context refers to active representations of objects, relationships between objects and means of manipulating these. By active representation we mean a representation (or mental model)

that is adaptive to circumstances, not a static collection of information. For example, what are the salient features associated with plants and animals, what features are used to classify these, in what processes are the plants/animals important, what methods utilise or influence them? So we were interested in how people create new knowledge, use that knowledge, and most important for our purpose, how knowledge (new or otherwise) is transmitted and reproduced.

Based on our research on knowledge transmission, our overall purpose was to evaluate, and when appropriate advance, methods for ethnographic interactive research more generally. We focused on evaluating and expanding the use of existing best practice, using qualitative, quantitative and/or computer-based tools and methods as appropriate.

Key findings

General Ethnographic Research Methods

1. Gathering data relating to knowledge requires a number of different contexts to be relatively complete. Data from any one mode is vastly incomplete, although may be sufficient for targeted purposes. Information collected will vary depending on if it is gathered by observation, participation, interviews informal and formal in different relative modes to the topic; on location, during a process using knowledge.
2. The use of task based elicitation is critical for knowledge-based research. Much knowledge appears to become accessible through interactive 'unfolding' during the course of doing a task. Discussing the performance of an imagined hypothetical task will address broad outlines of knowledge, but not the detail.
3. Elicitation using objects, photos and video improves quantity and quality of data from a respondent greatly. Elicitation using concrete points of a process improves results. However, neither is a substitute for performing a knowledge based task.
4. Performing a task using interactive simulations can approximate the results of actually performing a task in many cases. This depends on the accuracy of the simulation (culturally and literally), the visual and aural cues available, the means of interaction (touch, interviewer mediated, voice) and the expertise of the respondent with respect to the task.
5. Qualitative and quantitative approaches to analysis are inter-connected. Research topics and research data are difficult to characterise as either, although specific research questions may be directly addressed using one or the other. However, to limit questions

as such appears unnecessarily restricted. We found so-called 'mixed-methods' appear to produce the best overall results in terms of richness of data collected.

6. Barriers to applying best practice to field research related more to preparation and management than execution. Most of the computer based tools we produced and evaluated were valuable because of their role in the field research and data management process.



7. A few 'new' things were made possible because of computer-based tools. These tended to relate to data elicitation using interactive simulations, which although possible without computational assistance, are either very difficult or too abstract.
8. Recording the interaction in interactive methods addresses a long standing problem with photo and video elicitation whereby it is difficult to analyse the results because of

uncertainty as to what the respondent was referring to at different points of the interview. It also addresses data management issues by binding the images, sound recording and record of interaction together.

We also had a number of more original findings that could have significant bearing on ethnographic method and analysis.

Specific Findings

1. Kinship networks, interaction and terminologies

We have produced an extensible database of some 200 kinship terminologies, with a facility for external researchers to contribute new ones, a software framework for analysis of kinship terminologies, methods for analysing kinship semantics, and methods for investigating kinship networks.

<http://anthromethods.net/kinwiki/>

2. Kinship terminologies

Much of anthropological research is more or less purely symbolic. Although we have a range of behavioural data that we collect, one of our principle concerns is the organisation of thought that underlies behaviour, not the behaviour itself. Unfortunately, most of the evidence regarding symbols and their organisation is indirect and indexical, which often leads us to apparently unresolvable questions.



Using the domain of kinship terminologies we have produced a substantial example of a symbolic domain defined entirely by relationships between a subset of symbols in the domain (without reference to external systems, such as genealogy) that is predictive. Based on a few basic terms (which vary by terminology), we can predict terminological positions for the complete consanguineal terminology, and in many cases the affinal terminology. For example, in American Kinship Terminology we need just the terms Father/Mother, Grandfather/Grandmother and Wife/Husband and relationships between them to predict the 'semantics' and structure of the remaining terms. This is done by starting with a base algebra for the minimal set of terms, and building up an algebra that describes the entire terminology based on inclusion of a small set of variables (such as sex, collaterality and generation). We have strong evidence that most if not all kinship terminologies can be described by at least one algebra. See kaes.anthrosciences.net for a simple description, more complex description and the open-source software.

The implications are pervasive. In short, we can demonstrate that a symbol system (kinship) directly impacts a physical system (biological relatedness), which impacts demographic processes (marriage, births). This is a concrete example of how changes in symbolic representation can drive how physical systems are enacted without being an analogy of the physical system. In some ways, the physical system becomes an analogy of the symbolic one. We are currently planning new research to extend this idea to other domains.

3. Development of metadata

For fieldnotes and images, video and sound, we have extended (or rather reduced) the CSAC Context Coding System from 200 metadata terms to 50, and plan to reduce to around 30. This will greatly facilitate having

consistent, if limited, metadata across data sources and hopefully improve take-up and use (see CCCS under resources in AnthroMethods.net).

4. Recording temporal and geographic context

A GPS receiver can be used to record locations for digital photographs, video and sound recording by relating the time stamp on the media to the track record of the GPS. However, this also produces a general record of the day's activities, when and where these took place, contextualised by the media record. One can play back the entire day while preparing fieldnotes, or at any time in the future. This requires further development, but is already a useful tool. However, the privacy issues that can arise from its use by researchers must be considered. Similar promise could emerge from its use by field consultants once the formidable ethical issues are addressed.

5. Qualitative and quantitative interactive methods

In ethnographic fieldwork data requirements change as data are obtained and preliminary inferences made about processes underlying patterning (qualitative or quantitative) observed during analysis of data. Fieldwork is aimed at determining what those processes are, hence it is impossible to define the data that should be used in advance. A good research design for qualitative, statistical and quantitative research in the context of ethnographic research depends upon the same interactive mode of fieldwork as is

commonplace in 'ordinary' ethnographic fieldwork; analysis of data and modification of design in accordance with patterning elucidated as data are obtained. Information Theory makes it possible to quantify the structure of relationships using a universal scale, possibly the only such scale available to social scientists. Because entropy-based measurement is not itself based on a sampling distribution, it is much more flexible with respect to evolving research design. This work is still preliminary, but for an example application see TableEntropy at AnthroMethods.net under Tools.

Publications and online resources

Gary Martin has based a session of the National Science Foundation Anthropology Methods Camp on results from the project.

<http://AnthroMethods.net>

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