# Using ATLAS.ti for Content Analysis[1]

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## Purpose

In qualitative research, data collection and analysis proceed simultaneously (Merriam, 2009). For information collected during war games, the data can be coded and analyzed to develop themes with the help of ATLAS.ti software. Krippendorff (2013) asserted that the use of ATLAS.ti software provides an advantage, because the text explorations are systematic "countering the natural tendency of humans to read and recall selectively" (p. 356). This paper addresses how ATLAS.ti software can be used to conduct content analysis of qualitative data.

## Content Analysis

Krippendorff (2013) defined content analysis as a "research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (p. 24). He outlined the components for content analysis as:

- Unitizing – why data was chosen?
- Sampling – how is the data representative of the population?

[1] The opinions, conclusions, and recommendations expressed or implied are those of the authors and do not necessarily reflect the views of the U.S. Naval War College, the Department of the Navy, or the Department of Defense.

- Coding – what is the interpretation of the data?
- Reducing – aggregating units of analysis or summarizing the data;
- Inferring – what do the data mean or cause?
- Narrating – make results comprehensible to the reader.

For the first two components, unitizing and sampling, the researcher takes into account when the data are collected. The researcher uses ATLAS.ti software to assist in conducting the next three components: coding, reducing, and inferring. However, the software does not write the report for the researcher, but helps the researcher in the narrating component by providing visual representations and readily available quotes to be incorporated in the report. To abstract themes, the researcher must flow from raw data to relevance to the research questions (Figure 1). In this way, the research questions can be grounded in the data by using an inductive approach, starting with a large quantity of observations to develop key themes about the topic.

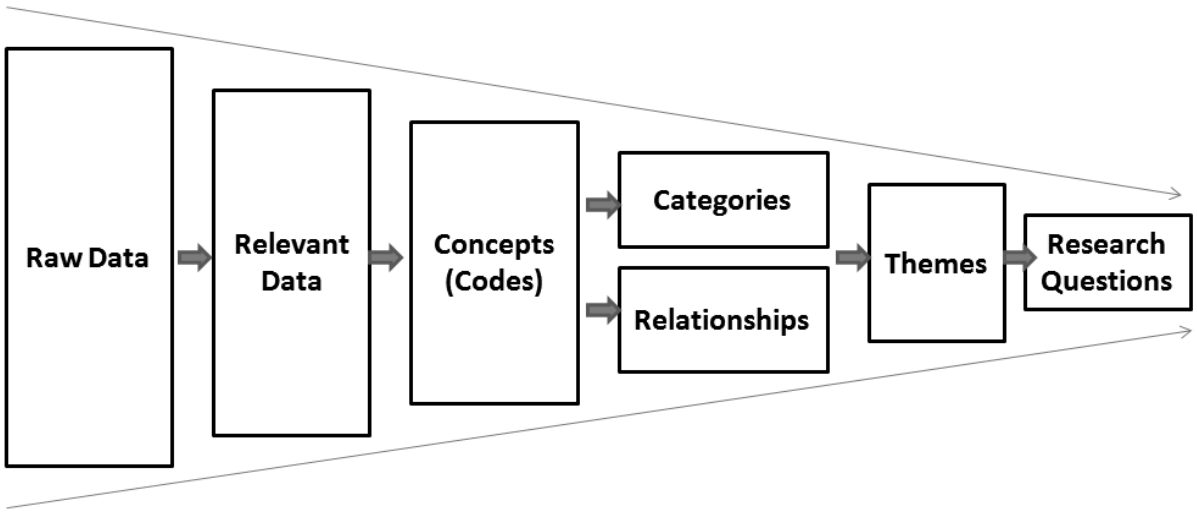


*Figure 1*. Flow of data analysis to develop themes relative to the research questions

ATLAS.ti software does not use the same terminology as depicted in Figure 1. The corresponding functions for ATLAS.ti to content analysis terms are depicted in Table 1.

| Content Analysis Terms | ATLAS.ti Functions |
|---|---|
| Raw Data | Primary Documents |
| Relevant Data | Quotations |
| Concepts (Codes) | Codes |
| Categories | Families |
| Relationships | Networks |
| Themes | Memos |

*Table 1*. ATLAS.ti functions that correspond to content analysis terms

**ATLAS.ti Process**

The narrative text collected during the war game, whether responses to open-ended questions from the survey questionnaire or observer notes, is loaded into ATLAS.ti software. This qualitative information is coded using the desired coding construct, either selective, in vivo, or open/emergent coding. The selective coding construct allows the researcher to identify relationships among a number of concepts identified during the literature review of the topic. The in vivo coding construct allows the researcher to utilize the concepts identified by the players during the game. The open or emergent coding construct allows the researcher to identify concepts that emerge serendipitously during the review of the data. The number of codes used by the researcher is a matter of preference, but when too many codes are used, it may prove difficult to abstract themes from the results. Content analysis is a type of qualitative design to develop themes from the text collected for "data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meaning" (Patton, 2002, p. 453). Therefore, to reduce the number of codes used, the researcher needs to combine a group of similar codes, sharing consistencies and meaning, into a single category of codes.

During the coding process, the researcher reads the raw data and interprets it based on the context to determine the codes to link to it. Every response to an open-ended survey question or

captured with an observer comment represents an occurrence. Each occurrence can be linked to more than one code.

Once the coding of the qualitative information is completed, the researcher leverages an ATLAS.ti co-occurrence frequency table to identify related concepts. The co-occurrence frequency measures all codes that co-occur across the data, that is, when a code is mentioned in the same occurrence when another code is mentioned. For the codes that co-occur, a c-coefficient is generated and defined as "the strength of the relation between two codes similar to a correlation coefficient" (Friese, 2012, p. 291). However, the data are qualitative, so the c-coefficient does not equal the Pearson coefficient and p-values are not calculated. When analyzing qualitative information from 10 to 20 players, a co-occurrence frequency count proves insightful in identifying inductive themes. When structured data from open-ended survey questions are incorporated, then the c-coefficient becomes useful to measure the strength of relationships.

According to Krippendorff (2013), the process of developing a co-occurrence frequency table and calculating c-coefficients does not produce findings, but represents the reducing process in order to aggregate units of analysis or to summarize the data. Once the information is aggregated in a network diagram, the researcher can then infer from the context in order to identify the meaning of the relationships depicted. The example depicted in Figure 2 illustrates that code 3 is related to codes 1, 2, 4, 5, and 6, while having stronger relationships with codes 2, 4, and 6. But it is not until the researcher reads the information associated with the co-occurrences that any meaning can be inferred and findings developed.

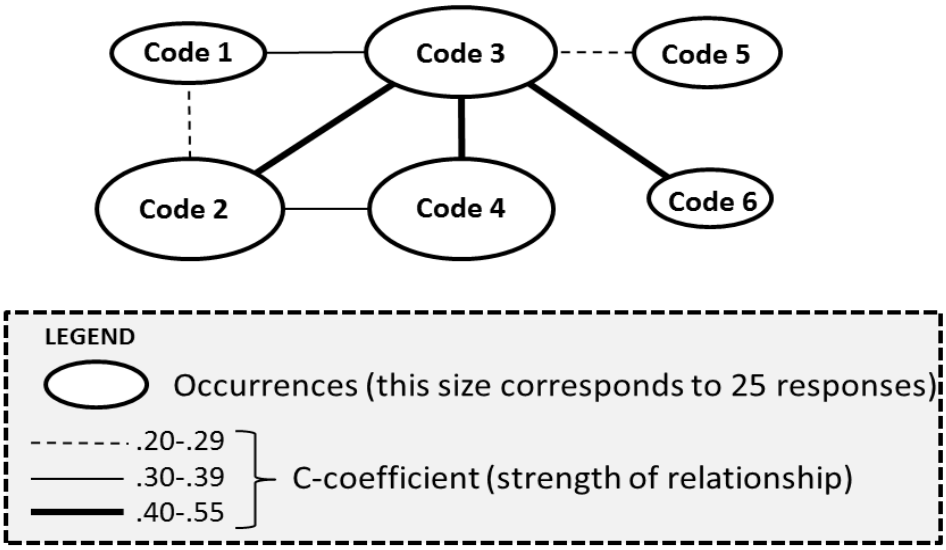


*Figure 2*. Example diagram of ATLAS.ti co-occurrence

To enhance the abstraction of themes while interpreting the results, a graphic representation or model can be constructed with the help of the ATLAS.ti networks function to show the evolving conceptual framework and relationships among the concepts. ATLAS.ti software does not derive the themes for the researcher, rather helps the researcher reduce the large amount of qualitative data into a summarized form in order to make sense of it.

Content analysis establishes validity "if the inferences drawn from the available texts withstand the test of independently available evidence, of new observations, of competing theories or interpretations, or of being able to inform successful actions" (Krippendorff, 2013, p. 329). The researcher can leverage ATLAS.ti software to conduct a rigorous and thorough process in order to ensure individual items of evidence are considered and evaluated relative to the body of evidence available. Furthermore, credibility of qualitative findings can be improved by providing thick description, which involves providing rich details to convey the findings, such as using the respondents' own words in the discussion of results. ATLAS.ti software assists in

providing thick description in the narrating component of content analysis by making readily available the relevant data, or quotations, that are directly linked to the themes of the research.

**Disclaimer:** This article was adapted from the methodology outlined in Ducharme, D. R. (2014). *Factors that influence the use of qualitative methods by institutional researchers* (Doctoral Dissertation). Providence, RI: Johnson & Wales University.

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