

## Sample Size and Grounded Theory

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### Abstract

Interviews are one of the most frequently used method of data collection and grounded theory has emerged as one of the most commonly used methodological frameworks. Although interviews are widely accepted, there is little written on an appropriate sample size. To tackle this concern a content analysis of one hundred articles that utilized grounded theory and interviews as a data collection method was performed. The findings indicate the point of theoretical saturation can be affected by the scope of the research question, the sensitivity of the phenomena, and the ability of the researcher. However, the average sample size was twenty-five, but it is recommended to plan for thirty interviews to fully develop patterns, concepts, categories, properties, and dimensions of the given phenomena. By knowing an approximation of the required number of interviews researchers now have starting point which will assist in the design, execution and budgeting of a research project.

**Keywords:** Grounded theory, sample size, interviews, theoretical saturation

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## Introduction

Qualitative research has increased in popularity in the last two decades and is becoming widely accepted across most disciplines (e.g. sociology, medicine, business & economics, psychology, anthropology) (Huberman & Miles, 2002). The data for qualitative research is collected through interviews, field notes, observations, videos, personal journals, memos, or other varieties of pictorial or written material with interviews being the most common data collection method (Creswell, 1998; Marshall & Rossman, 2006; Strauss & Corbin, 1998). With the increased interest in qualitative research there are questions regarding methodological issues (Jones & Noble, 2007; LaRossa, 2005). ‘Grounded theory’<sup>2</sup> is one of the most commonly used qualitative methods (Creswell, 1998). LaRossa (2005, p. 838) argued that grounded theory methods were “exhilarating” but “extremely challenging” due a perceived difficulty in understanding the procedure. In particular, sample size and validity are the most often queried aspects of qualitative research.

The aim of this article is to provide an outline of sample size and the reason for these requirements for grounded theory. In order to provide some empirical guidance for estimating an appropriate sample size, one hundred articles were reviewed that used grounded theory as a methodological framework<sup>3</sup>. The articles utilized interviews as a data collection method. The first section will discuss the factors of sample size which will be followed by a consideration investigation of theoretical sampling and its application in grounded theory research.

## Factors of Sample Size

The key to qualitative research and, in particular, grounded theory is to generate enough data so that the illuminate patterns, concepts, categories, properties, and dimensions of the given phenomena can emerge (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Therefore, it is essential to obtain an appropriate sample size that will generate sufficient data (Auerbach & Silverstein, 2003). For example, if the researcher is studying how cash incentives affect job retention within organization X which has 200 employees. The researcher will have to interview an adequate number of employees so that a clear picture of the patterns, concepts, categories, properties, and dimensions regarding how cash incentives affect their desire to remain with organization X will emerge.

What is the appropriate sample size? The question is answered by the concept of ‘theoretical saturation’ (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Theoretical saturation occurs in data collection when:

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<sup>2</sup> Grounded theory is a process by which a researcher generates a theory that is grounded in the data (Glaser & Strauss, 1967; Strauss & Corbin, 1998) by using a coding procedure to illuminate patterns or “concepts that are the building blocks of theory” (Strauss & Corbin, 1998, p. 13). The procedure allows for a systematic analysis of the data and follows a given, repeatable procedure.

<sup>3</sup> A search was performed using Proquest ABInform with the search parameter of ‘grounded theory’ in the citation and abstract. The first one hundred full text articles that stated sample size were used.

- “(a) no new or relevant data seem to emerge regarding a category,
- (b) the category is well developed in terms of its properties and dimensions demonstrating variation, and
- (c) the relationships among categories are well established and validated”  
(Strauss & Corbin, 1998, p. 212).

In other words, the researcher continues expanding the sample size until data collection (e.g. interviews) supplies no new data (Douglas, 2003; Goulding, 2002; Locke, 2001). Hence continuing with the example, the researcher would continue interviewing employees of organization X until the data they are gathering from the interviews becomes repetitive i.e. no new data emerges. This might take 10, 20, 30 or more interviews. By ignoring theoretical saturation the researcher risks creating theory based on inadequate development of patterns or themes and the result might be findings based on the lack of reliability and/or validity (Jones & Noble, 2007).

In the case of interviews, there is no set number for when theoretical saturation occurs (Glaser & Strauss, 1967; Strauss & Corbin, 1998). One of the aspects is that sample size depends on the research question (Morse, 2000; Sobal, 2001). A broader research scope will require far more data and thus require more data collection, which in turn, requires more interviews, and may require alternative data sources. This means considerable more work for the researcher. Thus, Strauss & Corbin recommend narrowing the focus of the research question at the beginning or after three or four interviews (1998). By using the first few interviews as guides to the essence of the phenomena the researcher can narrow the focus and thus reduce the number of interviews (Kwortnik, 2003, Strauss & Corbin, 1998). The data gathered from the initial interviews can be reviewed for later research projects that might focus on areas that were seen as peripheral for the initial research project.

Another aspect that might dictate sample size is the nature or sensitivity of the phenomena that being studied (Morse, 2000, Sobal, 2001). Values and beliefs that an individual holds are often considered deeply personal and thus research participants might be reluctant to share his or her thoughts. An example of this might be an individual's spiritual beliefs and how those beliefs relate to the work environment or how an individual's aligns his or her ethical values to those within the organizational environment. In order to gain sufficient data to derive a deep understanding of perceived sensitive and controversial phenomena, more interviews might be required (Morse, 2000). This could mean increasing the sample size or increasing the number of interviews with each participant in order to generate a more open and trusting interview environment. In turn, this trust would encourage a participant to be more forthcoming. Conversely, the less sensitive the nature of the project is the easier it will be for participants to talk about it (e.g. strategic planning implementation, job satisfaction) (2000).

The ability, experience or knowledge of the researcher will also affect sample size (Morse, 2000). Researchers with more experience and strong interviewing skills will require fewer participants as they can guide and encourage a participant to reveal data (Morse, 2000; Strauss & Corbin, 1998). The skill level of the researcher, usually acquired through experience, puts the participant at ease, creates a more conversational atmosphere that generates an aura of trust (Strauss & Corbin, 1998). The researcher's

knowledge of the given area might provide the researcher with insight that allows them to bypass unnecessary data and formulate questions that guide the interview more effectively. The researcher's knowledge can come from two sources; a literature review, which might be scant in the case of new phenomena, or personal experience. For example, Jette, Grover, and Keck (2003) used their experience and knowledge of physical therapy to interview nine physical therapists and occupational therapists regarding decision making in the discharge process in an acute care facility. A researcher with no background in physical therapy would have required many more interviews in order to gain sufficient background data to understand the decision making process.

Prior experience and knowledge could also be a hindrance to the researcher in that they might be influenced by their prior knowledge and thus miss or put aside valuable insights from participants (Strauss & Corbin, 1998). The preconceived notions that a researcher has must act as only a guide in the first few interviews. Strauss & Corbin (1998, p. 205) point out that:

“Because these early concepts have not evolved from “real” data, if the researcher carries them with him or her into the field, then they must be considered provisional and discarded as data begin to come in. Nevertheless, early concepts often provide a departure point from which to begin data collection...”

Thus the factor that determines sample size is based on the concept of theoretical saturation. As shown above the point of saturation can be affected by the scope of the research question, the nature or sensitivity of the phenomena, and the ability, experience or knowledge of the researcher. The following section will discuss the use of theoretical sampling as a further determinate of sample size.

## **Theoretical Sampling**

The quality of data can affect the sample size hence theoretical sampling is recommended when using grounded theory. The theoretical sampling procedure dictates that the researcher chooses participants who have experienced or are experiencing the phenomenon under study. By doing so the researcher has chosen ‘experts’ in the phenomenon and thus able to provide the best data (Corbin & Strauss, 1998; Glaser & Strauss, 1967). However, the process of selecting participants is also an evolving process based on the arising patterns, categories and dimensions emerging from the data. Researchers seek out participants that might be able to provide deeper understanding of the emerging patterns, categories and dimensions. Thus, if the participants are predetermined the researcher might find that an increase in samples size is required in order to follow emerging themes.

“Theoretical sampling is cumulative” (Strauss & Corbin, 1998, p. 203). Each interview provides the researcher a selection of data on which he or she can build. Iterative analysis of the collected interviews carried out through the data collection process allows the researcher to visualize the emerging patterns, categories and dimensions (Kwortnik, 2003; Strauss & Corbin, 1998). Iterative analysis is a process in which the researcher moves back and forth through the data in order to find, compare, and verify the patterns, concepts, categories, properties and dimensions of the phenomena (Kwortnik, 2003). Having gained an insight of what the emerging patterns, categories and dimensions are the ensuing interviews can be focused on filling out those patterns, categories and dimensions to the point of saturation. Therefore, sampling is also aimed at the same end

result of iterative analysis and might necessitate interviewing participants who are more versed in the phenomena thus providing higher quality data (Glaser & Strauss, 1967; Strauss & Corbin, 1998). The flexibility of theoretical sampling allows the researcher to follow directions indicated by the data; hence, a reduction in sample size is possible by choosing appropriate participants (Glaser & Strauss, 1967; Strauss & Corbin, 1998).

By using theoretical sampling and targeting the most knowledgeable participants the quality of the data gathered in each interview can be increased. “There is an inverse relationship between the amount of usable data obtained from each participant and the number of participants” (Morse, 2000, p. 4). In other words, the greater the amount of usable data a researcher is able to gather from a single participant the fewer participants that will be required (Morse, 2000). Thus, theoretical sampling provides a sample selection that is more likely to highlight the patterns, concepts, categories, properties, and dimensions of the given phenomenon (Glaser & Strauss, 1967; Strauss & Corbin, 1998). This provides a clearer picture for a model of the phenomenon to be developed and then tested using other methods.

However, the question still remains what is the correct sample size to anticipate? As demonstrated in the preceding review it is a difficult question to answer. Some insight might be provided by a simple review of current studies that used grounded theory. One hundred research articles from various disciplines that used grounded theory were selected [1] from the seven year period, 2002 – 2008 (Appendix A). Grounded theory can use a variety of data gathering techniques thus the articles chosen were restricted to studies that used interviews. The average of all one hundred studies was 25; the range was 5 to 114. Thirty-three of the studies used sample sizes between 20 and 30, thirty-two used between 10 and 19, twenty-two used more than 31, twelve used under 10 and one used more than one hundred (114). The review does not shed light on a specific number but it does highlight several factors.

An analysis of the articles demonstrates the various factors that can be involved and how they were applied. Expertise in the research area helped to facilitate a smaller sample size as well as achieving usable results (e.g. Jette, Grover & Keck, 2003). Using multiple interviews with the same participant to gather more in-depth data led to a smaller sample size (e.g. Troiano, 2003, or Lee, Woo & MacKenzie, 2002). The study that used more than 100 participants had a broad research question (e.g. Mason & Harris, 2006). The research question dealt with the environmental factors that influenced market orientation using a sample population across fifty organizations in various industries and of different sizes. The authors state that since there was little known in the area it justified a large sample population (Mason & Harris, 2006). However, for most research projects, conducting and transcribing over one hundred interviews is very time consuming and increases the cost. The authors may have been able to reduce the number of interviews by limiting some of the controllable factors (e.g. industry).

The result of the analysis of the one hundred articles is that sample size for grounded theory relies on the point of theoretical saturation (Glaser & Strauss, 1967; Locke, 2001, Goulding, 2002, Strauss & Corbin, 1998). Researchers cannot make a judgment regarding sample size until they are involved in data collection and analysis (Corbin & Strauss, 1998; Glaser & Strauss, 1967). They must allow the data to dictate the sample size; therefore, it is important to undertake data analysis during the data collection process. After each interview the researcher or researchers should review the data and the emerging themes. This review will help identify the point of theoretical saturation.

The literature review demonstrated that saturation normally occurs between 10 and 30 interviews. Although saturation might occur after the tenth interview, it is good practice to test the level of saturation by conducting a few more interviews. Also these extra interviews act as a form of validation of the patterns, concepts, categories, properties, and dimensions that the researcher has developed from the previous interviews (Corbin & Strauss, 1998). Thus, it would be wise to anticipate 30 interviews in order to facilitate pattern, category, and dimension growth and saturation. It is only through the quality of the data that meaningful and valid results are developed, so it is essential that the researcher ensure that saturation has occurred (Corbin & Strauss, 1998; Glaser & Strauss, 1967).

## Conclusion

The aim of this article was to provide an approximation of sample size requirements and the reasoning for these requirements for a qualitative research method - grounded theory. The answer to that question is that sample size will be dictated by theoretical saturation and it can only be assessed during the data collection process. However, steps can be taken to reduce the number of interviews required. Careful management of research design factors such as focus of the research question, an awareness of the nature or sensitivity of the phenomena, and a careful assessment of the ability, experience or knowledge of the researcher can assist in reducing the number of the interviews that are required. From the analysis of one hundred articles the recommended is that researchers should plan on 30 interviews. This approximation will help guide researchers in their initial project design stages to set out reasonable timeframes and budget costs associated with data collection.

It was hoped that by utilizing a sample size of one hundred articles that it would capture a representative sample of a commonly used qualitative method – grounded theory. A limitation of this study is the fact that although the one hundred articles professed to use grounded theory, it is uncertain how well the methodological procedures of grounded theory were followed. However, the intention of the article is not to arrive at a definitive number but at an approximation because, as stated, theoretical saturation will be the final detriment of sample size when utilizing a grounded theory methodological framework. Further it should be noted that although the arguments surrounding the focus of the research question, sensitive nature of the phenomena and researcher's ability can be applied to other qualitative methods, the findings should not be generalized to other qualitative research frameworks. Each method has its own nuances that affect sample size and research should be undertaken to assess sample size approximation. The aim of this project was to offer an approximation only to assist in the design stage not to provide a set or given number.

Both qualitative and quantitative paradigms seek the truth. Therefore both traditions strive to ensure their findings are generated from an appropriate sample size. Human beings indeed present a complex system and when such a system is coupled with the complexities of life, the understanding of how individuals interact is a daunting task (Fornaciari & Lund Dean, 2001). By ensuring that researchers use an appropriate sample size a step is taken towards greater validity and understanding of the complexities of life.

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