Abstract: Many qualitative researchers are faced with the everlasting question of generalizability of their findings, especially when trying to support their research in front of quantitative researchers. Despite this state of affairs, qualitative researchers rarely discuss generalizability of their data and argue that a deeper understanding of the phenomena is the goal of their endeavor and not statistical generalization. Furthermore, quantitative researchers usually dismiss the results of qualitative research based on the lack of generalizability. I argue that this state of affairs is a crude simplification of reality based on either a misconception about what qualitative data is or on a misconception of the aspects of qualitative data analysis that lead to generalizability like: the purpose of the research, the sampling method, the data analysis method and the coding strategy. The paper suggests that discussions on generalizability should become the standard for reporting qualitative report if the research question is phrased to demand a general answer.

Keywords: qualitative research; generalization; external validity; non-probabilistic sampling; coding; grounded theory.

What is generalization

The most important standards of research are validity and reliability. Still, the definitions of validity and reliability are sometimes considered to differ for qualitative and quantitative research. In quantitative research, reliability is the "consistency of a measure of a concept" (Bryman 2008: 140), while validity is a measure of "whether an indicator (or set of indicators) that is devised to gauge a concept really measures that concept" (Bryman 2008:151). Generalizability is also known as external validity (Bryman 2008; Chelea 2001). Also, the distinction between external and internal validity and external and internal validity may be adapted to the purposes of qualitative research. While external reliability refers to the replicability of a qualitative...
study, internal reliability refers to inter-rater reliability if multiple coders or observers are used for qualitative coding or observation. On the other hand, external validity is used to refer to the degree to which a research is generalizable to other settings, while internal validity is concerned with the link between theory and observation or coding. Some researchers use the term validity with the meaning of internal validity (see for example Hanson 2008: 107) while others use the term reliability with the meaning of external reliability (see for example Potter and Levine-Donnerstein 2009: 261).

Generalization is not accepted by many researchers as the purpose of qualitative, interpretative research. For example, by looking at the qualitative research literature Onwuegbuzie and Leech (2009) argue that in qualitative research statistical generalization is usually replaced by "analytic generalizations" – generalizability to theory instead of population based on how concepts relate with each other – and "case-to-case transfer" (p. 883) – generalizing from one case to other similar cases from a chosen set of points of view. This conclusion is shaped by Firestone's (1993, cited by Onwuegbuzie and Leech 2009 and by Polit and Beck 2010) models of generalization, namely statistical, analytic and transferability. Analytic generalizations are thus meant to generalize "from particularities to broader constructs or theories" (Polit and Beck 2010: e4). Hanson (2008) on the other hand points out that the notion of *universe* that is used in generalizations based on quantitative research has the same role in generalizations based on qualitative research as the notion of *context*. Other researchers point out that the standards of qualitative research should be trustworthiness, instead of internal and external reliability and validity. It should be measured as credibility, transferability, dependability and confirmability (Guba and Lincoln 1994, cited by Bryman, 2008).

Nevertheless, generalization is defined in many ways. For example, Polit and Beck (2010: e2) think of generalization as "an act of reasoning that involves drawing broad conclusions from particular instances – that is, making an inference about the unobserved based on the observed. In nursing and other applied health research, generalizations are critical to the interest of applying the findings to people, situations, and times other than those in a study". On the other hand, Payne and Williams (2005: 296) think that "[t]o generalize is to claim that what is the case in one place or time, will be so elsewhere or in another time". They see generalization as an inductive reasoning process. Bryman (2008: 187) argues that generalization is not only concerned about drawing conclusions from a sample to a population, but also from one period of time to another.

More than this, Polit and Beck (2010) argue that what is considered to be statistical generalizability is either a myth or an ill applied theory. They point out that most random sampling is extracted from a conveniently accessible population, like students at the university, while the population to which the generalization is to be made is usually poorly defined in most quantitative research (Polit and Beck 2010: e4). This means that the starting point of constructing a sample is usually the sample and not the characteristics of the population (Polit and Beck, 2010). Nevertheless, generalizability is mainly a standard and especially a high standard which cannot be judged to be appropriate or not by arguing that most researchers do not follow it.
In this paper I will argue that generalizability should be considered as a standard of evaluation if the research question reveals the need to generalize, and if the sampling method and the data analysis method allow generalization. In the first part of this paper the practice of generalization in qualitative research will be shortly investigated. Then sampling requirements for generalizability will be pursued within the literature, such that in the third section the connection between data analysis methods and generalization may be analyzed. The final part of the article will draw some conclusions about the conditions in which qualitative research is generalizable.

The practice of generalization in qualitative research

The main argument against using statistical generalization for qualitative studies is that their purpose is not to generalize. In support of this claim, researchers have studied the types of generalization that are usually employed by qualitative researchers. While some researchers from interpretive sociology reject the standard of generalizability altogether, others use "moderatum generalization". Moderatum generalization means that results of qualitative inquiry "are not attempts to produce sweeping sociological statements that hold good over long periods of time, or across ranges of cultures", but conclusions that are "open to change" (Payne and Williams 2005: 297). The conclusions of such moderatum generalizations may be further tested statistically, but this is considered to be a different topic. On the other hand, qualitative research should ensure "transferability" by providing as much contextual information as possible in order to aid future researchers to identify the relevant characteristics that should be transferred to a different study (Lincoln and Guba, 1985, cited by Bryman 2008).

A study on research published in volume 37 of Sociology (journal of the British Sociological Association) from 2003, showed that scholars do not discuss generalizability, but make generalizations in different ways (Polit and Beck 2010). From 17 articles which employed qualitative methods, all have made generalizations, but only 4 tried to back up their claims openly (Polit and Beck 2010). These authors backed up their general claims either by "later feedback from a conference with a wider range of informants", by "call[ing] for more studies", by "claim[ing] moderatum status for their position" and by "deny[ing] to make them [generalizations]" (Polit and Beck 2010: 300). Similarly, generalization practices have been studied from articles published between 1990-2006 in the journal The Qualitative Report. From 125 empirical studies there were only 8 justified generalizations and 45 which have made generalizations (Onwuegbuzie and Leech 2009). Although there are no such studies available for Romanian sociology journals, it is easy to find qualitative research that gives general conclusions without discussions of how this is achieved with respect to sampling or coding method (see for example, Ecirli, 2012, Gheondea-Eladi, 2013) or research that neither gives general conclusions nor a discussion on the generalizability or transferability of the findings (see for example, Tufa, 2011). It is also easy to find qualitative research that does not require such discussions, since the population discussed is very small (see for example, Alexandrescu, 2010; Mihalache, 2010).

At the other end, researchers who employ quasi-experimental studies do not differ so much in their practice from their qualitative counterparts. Shadish, Cook, and Campbell
(2002) looked at how researchers make generalizations from quasi-experimental studies that do not abide to sampling theory due to various causes like: lack of resources, logistics, time constraints, ethical constraints or political ones or simply because "random sampling makes no clear contribution to construct validity" (p. 348). Their study provides some examples for the claim that quantitative studies rarely abide to the random sampling requirements that support statistical generalization, proposed by Polit and Beck (2010). Shadish et al. (2002) argue that researchers use five principles in order to ensure generalizability:

- **surface similarity**, which is based on "surface similarities between the target of generalization and the instance(s) representing it" (p. 378). For example the identification of the characteristics of the target population to which a generalization is sought. In this way generalization can be made from treatments or outcomes or persons for which the study has been undertaken to other treatments, outcomes or persons which share these same surface similarities.

- **ruling out irrelevancies**, which is based on the "identification of those attributes of persons, settings, treatments, and outcome measures that are presumed to be irrelevant because they would not change a generalization and then to make those irrelevancies heterogeneous (PSI-Het [purposive sampling for heterogeneous instances]) in order to test that presumption" (p. 380)

- **making discriminations** between "kinds of persons, measures, treatments, or outcomes in which a generalization does or does not hold. One example is to introduce a treatment variation that clarifies the construct validity" (p. 382). For example discriminating between two levels of a construct for which the two levels lead to substantial changes in the direction and the size of the causality.

- **interpolation and extrapolation** by "interpolating to unsampled values within the range of the sampled persons, settings, treatments, and outcomes and, much more difficult, by extrapolating beyond the sampled range" (p. 354). For example, the use of more than one level of a treatment or of a response, instead of using dichotomous variables for their estimation brings about the possibility to make inferences about the levels of the treatment or of the responses that have not been captured in the study. Extrapolation means making inferences from a range of treatment levels to those outside the range. Interpolation means making inference from a range of treatment levels to those within the range, despite the fact that they were not captured in the study.

- **causal explanation** which is employed by "developing and testing explanatory theories about the target of generalization" (p. 354), for example by testing whether the same stimulus has different effects in different settings. In this case, to generalize would be to say that all different effects have the same cause.

These generalization principles, as can be seen are very similar to those employed earlier for qualitative studies, except for the causal explanation which cannot be assessed through qualitative research. Nevertheless, generalizability is also dependent
on the sampling method, and the data analysis method. The following sections will address the link between these two elements of research and generalization.

**Sampling methods for generalizability**

In a very simple and generally accessible account, qualitative studies are studies that look at words as data instead of considering numbers as data (Bryman 2008). In qualitative studies research and theory are linked in an inductive manner as opposed to the deductive one from quantitative studies (Bryman 2008). Also, the epistemological view in qualitative research is interpretivism and the ontological one is constructivism (Bryman 2008). Quantitative studies depart from a theory that potentially answers the research question of the study, formulate hypotheses, choose a research design, select sampling units, collect data and analyze the data in order to formulate some conclusions that will answer the research question. Qualitative studies also depart from a research question, but collect data that will later be interpreted in order to formulate a theory that will lead to an answer to the research question. Nevertheless, this overly simplified view does not reflect the complexity of either qualitative or quantitative research. In practice, quantitative studies may depart from the data to look for a "problem" that may be explained by several theories which will be tested against further data or start from a theory that explains the research question and test the particular theory against the data. In a similar manner, qualitative studies may interpret data in light of a chosen theory (top-down analysis) or build a new theory from the data (bottom-up analysis).

In light of these general differences, sampling for qualitative and quantitative analysis is also performed differently. Usually, sampling is performed in order to "estimate the true values, or parameters, of statistics in a population, and to do so with a calculable probability of error" (Russell 1988: 79). While quantitative studies employ probabilistic samples, qualitative research is usually concerned with non-probabilistic sampling: quota sampling, haphazard (convenience) sampling, snowball sampling, purposive sampling and theoretical sampling (Russell 1988). While quota sampling requires previous knowledge about the population to which generalization is to be made, the other types of non-probabilistic sampling requires little or no previous knowledge about it. Convenience and snowballing sampling is mostly employed in qualitative research for pilot tests or for populations that are very difficult to reach, like drug users or some vulnerable groups. This is why only the last two non-probabilistic methods will be of interest in order to study the generalization potential of qualitative research.

**Purposive Sampling**

Purposive sampling was originally a probabilistic sampling technique which described "a random selection of sampling units within the segment of the population with the most information on the characteristic of interest" (Guarte and Barrios 2006). There are two types of purposive sampling (p.s.): p.s. for typical instances and for heterogeneous instances (Shadish et al. 2002). P.s. for typical instances is based on defining and randomly selecting typical cases and their characteristics. Generalization in this case is possible only for units that share the selected characteristics. P.s. for heterogeneous instances is based on defining typical cases and randomly selecting units in order to
obtain the widest variation possible for the sample. The logic of this type of sampling is that if relationships are validated despite the wide sample variation, then these relationships will be very strong. In general this type of sampling differs from the one performed for quantitative studies in that it seeks to replicate the mode of the desired population within a sample with the widest variation, instead of replicating the mean of the population in the sample. For qualitative sampling this method is usually performed without random selection from the population with the most amount of knowledge.

**Theoretical Sampling**

Theoretical sampling is a recursive type of purposive sampling that stops when theoretical saturation is obtained (Bryman 2008; Strauss and Corbin 1998). This means that new data are no longer obtained, that each category for which a sampling session has been organized is developed in a way that is satisfactory and that the relationships between categories have been shown to be stable and valid (Bryman 2008; Strauss and Corbin 1998). Data is analyzed after each sampling session and new sampling units are defined according to the theoretical needs of the developing theory. Generalization from theoretical samples thus infers from some particular descriptions to a general theory. Particular descriptions are based on the identification of typical characteristics and irrelevancies, just like in purposive sampling. The transfer from particularity to theory is performed by means of abstraction or conceptualization. This is the point in which data analysis becomes an issue. But data analysis cannot be performed unless sampling units are defined properly.

**Sampling Units**

Defining sampling units is the main starting point in any sampling endeavor. But this is not a linear process, but an iterative one between the universe, context or theory to which the generalization is performed and the potential sampling units. It is important to decide what kind of outcomes are desirable at the end of the research. In order to provide an explanation for this, I will describe two sampling alternatives for a research I conducted. This research was aimed at studying the decision-making models employed by patients with chronic Hepatitis C Virus (HCV) infection. The main research question of the study was: how do patients with chronic HCV infection (CHCVI) decide between treatments for their illness? Two logical structures of the methodology for such a study could be envisaged:

1. If a sample is extracted from the population of patients diagnosed with CHCVI, then the characteristics of the structure of the decision-making process employed by these patients should be generalizable to the population of all HCV infected patients.

2. If a sample is extracted from the population of decision-making situations of patients diagnosed with CHCVI, then the characteristics of the structure of the decision-making process employed in such situations should be generalizable to a general theory of decision-making for patients diagnosed with CHCVI.

In other words, one may use as sampling units people diagnosed with CHCVI or the contexts in which these patients decide. Also, it is possible to generalize to the population of people diagnosed with CHCVI or to a theory of decision-making.
applicable to this type of patients. For the first type of sampling units, purposive sampling is required because patterns of decision-making will be followed in patients' accounts and inferences will be of the type "most patients decide in this way". If enough data is sampled, inferences can then be refined to "most patients with these characteristics decide in this way". Purposive sampling in this case means that patients should be randomly selected from the population of patients with CHCVI. For the second type of sampling units – decision-making situations or contexts – a theoretical sampling is required because patterns of decision-making will be pursued within particular contexts and inferences will be of the type "in most situations, patients decide in this way". If enough data is sampled, inferences can also be refined to "patients in this type of situation decided in this way". Thus, knowing that both context and patient characteristics influence the decision-making structure of patients with CHCVI, it is possible to sample one or the other, since neither can be held constant. If contexts are sampled, the underlying assumption is that patients employ the same decision-making structures irrespective of their internal characteristics (like education, intelligence, etc.). If patients are sampled, the underlying assumption is that patients employ the same decision-making structures irrespective of the context they are in (family support, medical support received, stage of illness at diagnosis, etc.). Clearly, both assumptions lead to a simplified representation of reality.

As mentioned before, the purposive sampling method requires previous knowledge about the population, while the theoretical sampling procedure does not. In our case, the purposive sampling method requires knowledge about the cases in which the decision-making structures differ, like: (1) the characteristics of the decision-making situation which cause patients to adopt a decision-making structure or another; (2) characteristics of the diagnosis which cause patients to adopt a decision-making structure or another. The theoretical sampling procedure requires an iterative data collection strategy and data-driven re-sampling and data collection. It is based on purposive sampling on various concepts of the developing theory.

**Qualitative data analysis for obtaining general results**

Many times it is assumed that in qualitative research coding is the data analysis, but this is only an intermediary step that facilitates analysis (Saldana 2009). Still, coding takes the most amount of the time spent to analyse qualitative data and it may also lead to differences in the latter data analysis, since different coding schemes will lead to different results. This is why qualitative researchers have given it great priority when discussing qualitative data analysis. On the other hand, the validity and reliability of a qualitative study depend on the validity and reliability of the coding scheme (Potter and Levine-Donnerstein 2009).

Coding can be performed in two separate ways: top-down and bottom-up. In top-down data analysis, the researcher departs from theory and uses predefined coding schemes to pursue this theory within the data. This type of coding scheme should be followed by analysis which may use either quantitative measures (e.g. frequency tables) or qualitative measures for the main concepts (e.g. a synthesis of contextual elements that provide answers to the research question or differences in the meanings of the main
Top down data analysis

Top-down data analysis departs from a theoretically driven coding scheme in which the concepts and categories of the coding scheme are pre-established with respect to the driving theory. Extensive rules for applying the codes need to be designed in order to ensure the consistency of their application. Potter and Levine-Donnerstein (2009) point out that reliability and validity are constructed differently depending on the "locus of meaning" (p. 261). Moreover, they argue that the "the locus of meaning” leads to “manifest” content, “latent” content and "projective” content, each one of them having different relationships to theory and different ways to construct reliability and validity. "Projective” content leads to particularly difficult tasks for coders since codes are attributed by "constructing interpretations" (p. 261), while for "latent” content the task requires the recognition of patterns. The easiest task for coders is given for coding manifest content, when the accurate recording of content is the only task required (Potter and Levine-Donnerstein, 2009).

The internal reliability and validity of a top-down coding scheme are given by the consistency with which the coding scheme is applied (Potter and Levine-Donnerstein 2009) and by prior testing of the coding scheme against data. External validity on the other hand, depends on the degree to which the coding scheme reflects the theoretical concepts of the driving theory such that they will be transferable to other settings. For example, if a coding scheme is very much particular to the setting it is applied to and has little links to the theory, then it may be more difficult to find common grounds to transfer it to other settings. On the other hand, if the coding scheme is too abstract and has little connection with the data, while being strongly theoretical, it will be very difficult to explain why a certain fragment of text should be coded in one way and not the other. Some trader-off or middle way should be achieved.

Bottom up data analysis

Bottom up data analysis is usually performed as part of grounded theory. Grounded theory aims to construct a formal theory that would answer the research question, but emerges directly from the data and not the other way around. Bryman (2008) gives a very intuitive scheme for the work-flow of grounded theory (Figure 1).

Grounded theory is based on open coding which is "an analytical process in which concepts are identified and their properties and dimensions are discovered within data (Strauss and Corbin 1998). Open coding is also an iterative process in which data is transformed in either in vivo codes or concepts which are then classified – thus forming classifications – and then grouped into categories. Passing from data to concepts or from in vivo codes to concepts requires a process of abstraction. In open coding, concepts and classifications are then interpreted by means of memos, to form categories
(Strauss 1987). The links between different concepts, classifications and categories are used to form the substantial theory. Strauss and Corbin (1998) differentiate between (1) coding in vivo which means labeling a part of text by using the words of the responder; (2) conceptualizing, which means labeling a phenomenon by means of abstraction; (3) classification, which means the identification of types of a certain concept; (4) categorization, which means the interpretation and/or clustering of concepts into categories. Strauss and Corbin (1998) point out that it is always possible to classify the same content in different ways, just as a pen, a paper knife and a press-papier can either be tools for writing or weapons.

**Figure 1. The work-flow in grounded theory**

[Diagram: Research Question, Sampling, Data Collection, Coding Concepts, Constant Comparison and Feed-back Categories, Category Saturation, Exploring relations between categories Hypotheses, Theoretical Sampling, Data Collection Testing Hypotheses Substantial Theory, Data collection in other settings Formal Theory]

*Source: Bryman (2008)*

After a substantiated theory has been built, the research is replicated in other settings such that several other substantiated theories will yield. After a satisfactory amount of replications have been performed, a formal theory may emerge from all substantiated ones. In terms of validity and reliability of this theory, it is now easy to see that the consistency of concepts and categories of each substantial theory should be preserved in order to ensure a reliability of the formal theory. Also, the accuracy of the coding should be controlled to preserve the internal validity of the theory. Replicability in
different settings, on the other hand should ensure the external validity of the final formal theory.

**Coding and data analysis**

As mentioned before, coding and data analysis are not the same procedure (Basit 2003; Saldana 2009). Some coding may be analyzed quantitatively, by counting frequencies for example while the same coding may be analyzed qualitatively, by uncovering underlying meanings or links between concepts. Open coding or top-down coding does not give the research a qualitative or quantitative orientation. It is the actions that are performed with the resulting codes that provide such an orientation. Clearly, the choice of the data analysis depends on the research question.

**In which circumstances is qualitative research generalizable?**

In this paper generalization has been discussed with respect to qualitative methodology. After discussing some differences in defining generalizability with respect to qualitative and quantitative research, the results of several studies on the practice of generalization have been presented. Further on, the link between generalizability and sampling methodologies characteristic to qualitative studies have been presented and an example of choosing among alternative sampling units and sampling methods for one study has been discussed. Furthermore, top-down and bottom-up coding techniques were presented with respect to their subsequent data analysis method and their contribution to external validity. In this way, this paper argues that some qualitative research can be led by the standard of generalizability.

Since the main parts of a research which provide external validity are the sampling method, the coding strategy and the data analysis method, qualitative research is generalizable when the appropriate sampling, coding and data analysis methods are employed. Moreover, if the sampling method is either purposive or theoretical, generalizations can be performed either to the typical population represented by the sample or to a theory. Further attention should be given to the identification of the characteristics of the typical population and to those characteristics deemed irrelevant, in case of purposive sampling or to the provision of enough data that would allow replication and transfer of the research to different settings in case of theoretical sampling.

The implications of this study on generalization for qualitative research are primarily concerned with the general practice of reporting of qualitative research results. Since qualitative research can be generalizable, an open discussion on generalizability should become the standard in reporting qualitative analysis if the research question is phrased in a way that demands a general answer. An open discussion on this topic should address the issues of the relationship between the sampling method employed and external validity as well as between the coding method and external validity. Any qualitative data report should also discuss its potential for transferability and replicability of the research.
Bibliography


