A Discussion of the Concepts of Validity and Reliability in Qualitative and Quantitative Research

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Abstract: The purpose of this paper is discussing the main issues in conceptualizing reliability and validity between qualitative and quantitative research approaches. The researcher examined the arguments about validity and reliability in inquiry methodology and identified three main debates primarily in qualitative research. The first one was about qualitative inquirers' limited emphasis on the data collection process to increase the robustness of their research efforts. Most of the strategies in qualitative research (e.g. peer debriefing, member check, audit trail) are used after completing the data collection procedures. Another important discussion in social inquiry was about what valid research means in qualitative paradigm. There are various interpretations of what validity is in qualitative research. This is due to epistemological grounds of qualitative research. Qualitative research does not accept a single truth. Reality is not fixed in qualitative research. It is concerned with cooperation of the multiple constructed realities to reach the contextual truth. The third debate reported in the literature was the discussion about reliability in qualitative research. It is evident that replication of any qualitative methods will not release the same results due to changing contextual conditions. Even though reliability has a long history in inquiry methodology discussions, some qualitative inquirers claim that reliability is not an appropriate concept for qualitative inquiry.

Keywords: qualitative research; quantitative research, validity, reliability

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Özet: Bu çalışmanın amacı nitel ve nicel araştırma yaklaşımlarındaki geçerlilik ve güvenirlilik kavramları ile ilgili ana sorunları tartışmaktır. Çalışmanın yürütücüsü araştırma metodolojisi alanında geçerlilik ve güvenirlilik kavramlarını incelemiş ve özellikle nitel araştırma alanında üç temel tartışma tespit etmiştir. İlk tartışma konusu olarak nitel araştırmacıların çalışmalarını güçlendirmek için araştırma sürecindeki veri toplama aşamalarına az önem vermesi olmuştur. Bu amaçla kullanılan stratejiler (akran sorgusu, üye kontrolü, denetim izi) veri toplama süreçlerinin tamamlanmasından sonra işe koşulmaktadır ve araştırma sürecini sınırlı olarak güçlendirebilmektedir. Sosyal bilimlerdeki diğer bir tartışma konusu da nitel araştırmalarda geçerli araştırmanın tanımının ne olduğu ile ilgilidir. Nitel araştırmada geçerlilik kavramı ile ilgili birçok farklı yorumlama vardır. Bu tartışma nitel araştırmaların bilgi kuramı ile ilgili temellerine dayanır. Nitel araştırmalar doğrunun zaman ve mekâna bağlı olarak değişkenliğini savunur. Nitel araştırmada gerçek sabit değildir ve bağlamsal gerçeğe ulaşmak için birden çok inşa edilmiş gerçeğin birlikteliği ile ilgilenilir. Üçüncü tartışma konusu nitel araştırmalardaki güvenirlilik konusu ile ilgilidir. Şu apaçık ki nitel araştırmalarda tekrarlanan metotlar hiçbir zaman aynı sonuçları vermezler. Bu bağlamsal şartlardaki sürekli değişmeler araştırmacının süreçteki muhtemel değişken yorumlamaları ile ilgilidir. Güvenirlilik araştırma alanında uzun bir tartışma geçmişine sahip olsa da, bazı nitel araştırmacılar güvenirliliğin nitel araştırmalar için geçerli bir kavram olmadığını savunmaktadır.

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INTRODUCTION

In order to discuss the issues of validity and reliability in quantitative and qualitative inquiry, the reader first need to be introduced the quantitative versus qualitative comparison among social researchers. The two perspectives have the same goal but through different pathways and epistemologies. Quantitative inquiry follows the model of natural sciences and obtained its roots from positivism (Sale, Lohfeld, & Brazil, 2002). A quantitative scholar in social science collects the findings of the social world independent from the context and values, and generates an explanation by organizing such information (Noor, 2008). These organized knowledge are separated from people's values (Putnam, 1981). The scholars in social studies argued positivism's lack of value ignorance as a reason for an alternative approach (Clark, 1998). Thus, a counterpart interpretive approach was developed in the late nineteenth century as a reaction to positivism that looks at "inner-lived experiences" of people called qualitative inquiry (Smith & Heshusius, 1986, p. 5). This perspective stressed people's values, purposes and interests (Putnam, 1981). However, qualitative inquiry, lacking criteria for "rigor", did not convince people at first hand (Morse, Barrett, Mayan, Olson & Spiers, 2002). The newness of the paradigm and the reporting style suspected journal editors, dissertation committee members, and readers about the rigor of this type of research (Guba, 1978). Hence, the need emerged for creating criteria for quality of qualitative inquiry (value driven, interpretive and context dependent) "as rigorous and systematic as quantitative inquiry" (Smith & Heshusius, 1986, p. 7). Guba and Lincoln (1981) were one of the first scholars who suggested specific criteria for trustworthy qualitative research and used different terms than reliability and validity. However, their definitions were criticized from different points of views. The following section of the paper defines what reliability and validity mean briefly, both for quantitative and qualitative research. The later part includes details about the issues in conceptualizing validity and reliability across qualitative and quantitative approaches in social science.

Reliability

Reliability is a technique scholars use to make sure the measures they apply are free from errors and reveal consistent results if repeated (Anastasi & Urbina, 1997; Crocker & Algina, 1986). If a measure is applied to a same group of people multiple times and scores (e.g. standard deviation) are consistent between the tests, that measurement tool is considered reliable for the purpose (Anastasi & Urbina, 1997; Crocker & Algina, 1986). For example, test-retest method, when an IQ test is administered to a same group of students two times, the results are expected to be consistent between the tests if the test is reliable (Kirk, 2008). The scholars in qualitative inquiry transferred the replicability idea from quantitative tradition, and used it in qualitative research to increase the trustworthiness of their research but with a different focus (Guba, 1981). For example, a researcher collects interview data (e.g. words) from subjects one time, transcribes, and interprets the data.

Another researcher rechecks the transcription quality and interpretation procedure to ensure the "consistency" of the qualitative inquiry.

Validity

Coming from the quantitative tradition, validity is defined as making sure a test measures what it purports to measure (Anastasi & Urbina, 1997; Crocker & Algina, 1986). The rationalist view's focus is on the design of a measurement tool, "inferences made from an instrument" (Thanasegaran, 2009, p. 37), to grasp all the possible and rule out the unnecessary. There are different types of validity tests applied in quantitative research such as content validity, construct validity, criterion validity and consequential validity (Fraenkel & Wallen, 2010). For example, with content validity, a researcher needs to make sure the items in an instrument reflect the construct it claims to measure before the data collected (Thanasegaran, 2009). Validity in qualitative paradigm changed its shape and focused more on the product of research. A researcher tries to make sure the validity of his/her data using triangulation (e.g. using multiple data sources), member-checks and peer debriefing techniques (Guba, 1981).

Reliability and Validity Issues in Research

In this section, the reader will be exposed to main issues in conceptualizing reliability and validity between qualitative and quantitative research. The first difference identified in the literature was about the procedures quantitative and qualitative inquirers use to increase reliability and validity (Morse et al., 2002). Quantitative inquirers primarily focus on the process (data collection stage) of a research study to ensure the reliability and validity of the methods to reach the truth. On the other hand, qualitative inquirers use the data collected, the product of research, to increase and support trustworthiness of the data. Another important controversial issue in social inquiry was about what valid research means in qualitative paradigm (Bailey, 1997). There are various interpretations of validity in qualitative research and there seems no one accepted way to address this concern. The third debate reported in the literature was the discussion about reliability in qualitative research. Even though reliability has a long history for quantitative inquiry, some qualitative inquirers claim that reliability is not an appropriate and necessary concept for qualitative inquiry (Merriam & Simpson, 1995).

Process versus product debate. LeCompte and Goetz (1982) did not differentiate reliability and validity between quantitative and qualitative inquiries, and argued that reliability and validity are fundamentally same in both paradigms. Miles and Huberman (1984) also stated that the terms such as rigor, trustworthy, valid, reliable could be defined in the same way in qualitative paradigm as quantitative paradigm. However, qualitative inquiry did not have a long tradition and techniques to convince the readers about the quality of research (Smith & Heshusius, 1986). Therefore, many

scholars in inquiry methodology declared the need for a systematic definition and an application of reliability and validity in qualitative research.

Guba (1981) was one of the first scholars who started this conversation and compared the two paradigms for rigor of research and called it trustworthiness in qualitative research. Guba used "credibility" instead of "internal validity," and suggested member-checks and triangulation methods to test interpretation with multiple resources. Instead of external validity, Guba suggested transferability in qualitative research. Qualitative research is context depended and a researcher needs to provide thick descriptions of the research context for the readers to be able to transfer the knowledge to his/her environment (Creswell, 2012). Guba recommended using dependability in qualitative research instead of reliability. Qualitative inquirers "believe in multiple reality and using humans as instruments" (Guba, 1981, p. 81). Therefore, instruments do not have to be consistent all the time but there has to be "trackable variance" (Guba, p. 81). Audit trail could be used to note and consider the changes in the data. Finally, Guba used confirmability instead of objectivity. Qualitative researchers (naturalistic) are aware of biases in culture. Therefore, Guba suggested using triangulation techniques and practicing reflexivity in the interpretation process. Even though Guba has underlined that his criteria are primitive, scholars in inquiry methodology accepted these criteria as guidelines for the quality of qualitative inquiry. However, aforementioned techniques were mainly on the credibility, transferability, dependability and confirmability of "collected data", which are the product of research. Hence, contemporary studies in inquiry methodology discussed lack of emphasis on the research process in Guba's approach (Morse et al., 2002).

Scholars in inquiry methodology contemporarily focused on the process of qualitative research while designing a study and suggested using validity and reliability, as defined in quantitative inquiry, on testing qualitative research process (e.g. Golafshani (2003), Healy & Perry (2000), Yin (1994), Kuzel & Engel, 2001). Morse et al. (2002) argued that Guba (1981), and Guba and Lincoln's (1981) criteria only emphasized the strategies (product-focused) at the end, which could cause threats to the reliability and validity when it is too late to fix problems (Morse et al., 2002). Morse (1999) furthermore debated that those product focused techniques make qualitative research unreliable and invalid. Morse et al. (2002) listed the limitations of product-oriented strategies. For example, member-check is used as a common strategy in qualitative research to verify the credibility of the data collected (Fraenkel & Wallen, 2010). It is stressed to examine if the participants think that the findings are credible and accurate. Morse et al. criticized that the people who verify the overall results of a research study could not recognize their participation in the synthesized data. In another example, Morse et al. criticized the idea of using audit trail for the consistency of the data. Even though the audit trail help the researcher to refer back to what has been done, it does not increase the reliability of the data collected before. After discussing the limitations of product-focused evaluation criteria, Morse

et al. recommended strategies for reliability and validity in the process of qualitative research as a "mainstream science and scientific legitimacy" (p. 16). These strategies are "investigator responsiveness, methodological coherence, theoretical sampling and sampling adequacy, an active analytic stance, and saturation" (p. 17).

"Validity" in qualitative research. Validity is a term that has roots in value and context independent quantitative paradigm. There is no single established definition for validity in qualitative research (Winter, 2000). Hammersley (1987) defined it: "An account is valid or true if it represented accurately those features of the phenomena, that it is intended to describe, explain or theorize" (p. 69). Kerlinger (1964) based on positivist perspective asked: "Are we measuring what we think we are?" (p. 430). As we can see in these definitions, the focus is on the instrument and aims to grasp the stable truth. However, interpretive paradigm supporters argue that qualitative research is open to changes in context and values, and there is no value of validity in qualitative paradigm (Bailey, 1997). In the quantitative tradition, people commonly refer to objectivity, truth, evidence, reason, fact and numbers when talking about validity (Winter, 2000) and validity in quantitative research are based on strict methodological rules and standards. However, when quantitative approach of validity applied to claim rigor of qualitative research, it produced disagreements and issues because qualitative research does not accept a single truth and objectivity (Krefting, 1991). Reality is not fixed in qualitative research. Qualitative research is concerned with cooperation of the multiple constructed realities to reach the contextual truth (Winter, 2000) and there are multiple interpretations of the truth. However, due to lack of criteria for the rigor of qualitative research, scholars disputed qualitative research as subjective and unscientific (Mishler, 1990). Therefore, qualitative inquirers made efforts to address this gap and developed strategies for the rigor of qualitative research. Scholars in inquiry methodology promoted their own approach to validity in qualitative research. While some of them continue adopting the rationalist definition of validity to address this concern (Morse, 1991; Silverman, 1993), some scholars developed techniques to meet the needs with naturalistic point of view (Denzin & Lincoln, 1998; Guba, 1981; Guba & Lincoln, 1981; Hammersley, 1995; Merriam & Simpson, 1995; Mishler, 1990). However, these efforts did not end the debate. These two points of views created two positions for qualitative research validity, those with positivist assumptions and those who labeled themselves as naturalist.

In the positivist approach, the researcher has to have a distance from real life and be as objective as possible to reach the real truth (Fraenkel & Wallen, 2010). The researcher aims to only do research that can be measured or quantified. This goes back to Descartes' realist orientation that rejects everything false and keeps only the truth (Bennett, 1990). If a researcher embeds his or her subjective point of views in research, this would damage the validity of the study and would produce incorrect results. Madison (1991) asserted that the validity of the method is what it matters for the accuracy of

knowledge gained in life and qualitative research should focus on the validity of the methods to reach the truth. On the other hand, Smith (1984) stated that interpretive approach does not accept the assumptions and methods of positivist paradigm. Knowledge exists in life with interactions and continues to evolve by time through "unquantifiable, personal, in-depth, descriptive, and social aspects of the world" (Winter, 2000, p. 8). Therefore, the truth is depending on the interpretation of the inquirer in our everyday experiences (Hammersley, 1995). A researcher needs to make the most effort to interpret the actions in life. Creswell (1998) had a similar approach while defining validity for qualitative research and listed eight specific techniques for the validity of a qualitative research study: prolonged engagement, triangulation, peer review, negative case analysis, clarifying researcher bias, member checks, thick description, and external audits. We need to note that all these strategies aim to strengthen the representation of the data and make the findings justifiable (Winter, 2000). As the basis of qualitative paradigm, various criteria claimed for the rigor of qualitative research presents flexibility for failure due to dynamic nature of social settings.

Despite many efforts to make qualitative research criteria acceptable for social science, scholars in inquiry methodology continue to debate that even those criteria follow positivist quantitative paradigm of research (Angen, 2000) and reported problems. For example, Morse (1994) strongly criticized using member checks for validity check because participants may change their beliefs and opinions, and disagree what they have said at the first interaction due to dynamic nature of human beings. Furthermore, since the researcher's interpretation is involved to ideas in a research report, the participants may not accept the researcher's position. This goes back to issue that the truth in qualitative research is not static and validity may not be tested through member checks (Angen, 2000). Another critique is about the idea of triangulation that challenges the roots of interpretive approach. With the triangulation, a researcher aims to find a common ground in multiple sources of data. However, qualitative research values context and this strategy loses the context while trying to find an objective meaning in data (Silverman, 1993).

It is evident that validity is a necessary construct in quantitative research. However, applying the validity idea from quantitative to qualitative research is not an appropriate move. Therefore, the scholars accept that the meaning of truth is different for each methodology (Winter, 2000) and "one could suggest that each different truth inevitably requires different means of validation" (p. 11).

Reliability in qualitative research. Qualitative research proposes that there is no one truth and it is constructed, dynamic and interpretive (Roberts, Priest, Traynor, 2006). There is no reality ready to observe and measure in qualitative research. On the other hand, reliability in quantitative paradigm defined as any research, if repeated, should provide the same results. Just by reading what qualitative research aims and the requirements of reliability in quantitative research shows us the problematic use of reliability in qualitative research. Since human behavior is always dynamic and no one should

expect to observe same outcomes in different times, reliability in qualitative research becomes an inappropriate concern (Merriam & Simpson, 1995). Furthermore, the scholars in qualitative methodology do not aim to answer their questions to theorize their findings for all human beings (Guba, 1981; Roberts et al., 2006; Winter, 2000). It is evident that replication of any qualitative results with high possibility will not release the same results (Merriam & Simpson, 1995). Therefore, instead of reliability, Guba (1981) announced a different notion to test whether the data collected in multiple times and using multiple instruments is consistent, and called it dependability (Guba, 1981, p.81). Guba recommended using triangulation (use of multiple methods), peer examination (someone else checks the interpretations of the data) and audit trail (journal of how the data collected, how the decisions made). These judgments suggest that reliability, as a notion for the rigor of research, cannot be applied to qualitative research as it is applied in quantitative research (Merriam & Simpson, 1995).

DISCUSSION

Even though the primary question was about issues in conceptualizing both quantitative and qualitative validity and reliability, contemporary discussions are evolving around qualitative validity and reliability (Madill, Jordan, & Shirley, 2000), and enforced the researcher to format the paper on that direction. The overall thought is that the terms validity is evolving and reliability is not appropriate criteria for the nature of qualitative research (Noble & Smith, 2015). The quantitative paradigm rooted validity and reliability foundationally accept the truth as static and look for consistency and one truth for everybody (Anastasi & Urbina, 1997). However, interpretive approach values different perspectives in research and sees knowledge as constructed in the context and people's values (Lee, 2012).

The first point in the discussion would be about what questions qualitative and quantitative paradigms ask. While quantitative research is asking cause-effect and relationship questions (what) to reach the product of human behavior, qualitative research aims to understand the progression of the relationship and behaviors (how) (Golafshani, 2003). For example, while quantitative research is trying to understand the relationship between a group of students' end of semester grades and their family income, gender etc., qualitative research does not look at the end product (Golafshani). A qualitative researcher, for instance, observes the students' family life and communication between the students to explain their achievements or failures. Therefore, qualitative research needs strategies to grasp these various constructs in their natural environment as free as possible (Bogdan, & Biklen, 1997). In another example, if a researcher aims to understand the factors that encourages female students to choose a science, technology or math career, it would be limited to create an instrument that focus only female students self-perceptions and talking about validity of the instrument by itself. A researcher needs to develop valid strategies that focus on the historical development of those students' ideas, their school life, failures and successes, and family life to reach that information.

Consequently, it is not appropriate to define product-oriented criteria for qualitative research because it is contrarious to the nature of qualitative inquiry.

A robust qualitative research should focus on the process of research while collecting data (Morse et al., 2008). Even though there are techniques scholars proposed for the trustworthiness of qualitative research, such as triangulation and using multiple observers, qualitative research needs more attention during the data collection process. For example, scholars need strategies that could help research participants to release their knowledge and feelings freely and strategies that could help scholars interpret the context better as they are in the same conditions. Scholars need theories for the validity of qualitative research that could give participants more voice and chance to express themselves in free and democratic ways, and therefore, scholars could reach the most valid information from the first source.

The second debate was about the applicability of validity to qualitative research. The concept of validity is important in qualitative research too. However, the strategies should have different focus. As discussed in the previous paragraph, validity in qualitative research should be tested during the process of research. However, most strategies use collected data to validate the researcher interpretations. For example, researchers could use strategies for process-oriented validity such as spending longer time in the context of the research to have better interpretations of the context and people's values.

Another problem is about external validity, which is not appropriate for qualitative research. Quantitative researchers aim to generalize their results to different context because they see the product of their research as truth. However, validity in qualitative research does not carry such a purpose to apply the findings to different contexts. The aim in qualitative research is the transferability of the results depending on the source and the target context information (Maxwell, 1992). The researcher agrees the definition and importance of transferability in qualitative research. A researcher has responsibility to define the context of his/her research in detail for the reader to evaluate the contextual information and transfer the applicable results of the study to his/her context. Overall, validity is important in qualitative research too and scholars need to spend more time to increase the validity of the instruments they use, to be able to understand and interpret values and context better, and keep transferability as a criteria and goal for qualitative research due to dynamic nature of human beings.

The final debate about reliability is the most crucial one. Reliability is a positivist concept that aims to reach replicability of the "truth." When we individually examine the keywords in the definition of reliability, we could identify reliability as an inappropriate criterion for qualitative research. For example, quantitative research aims replicability because it is important to collect the same information in quantitative research different times. Otherwise, there should be something wrong

in the instrument that either caused by vague items in a survey or incorrect questions asked for the purpose of the research conducted. However, there is no such as a case in qualitative research. Interpretive approach sees human beings as dynamic agents. A person could answer the same survey in different ways in different times. Therefore, if a survey represents different results, it could be due to dynamic nature of human beings such as values, context and the availability of conditions.

Another problem was about the understanding of truth. According to quantitative paradigm, there is one truth and truth exists in the world. Nobody could change that and a researcher's job is finding the best valid and reliable way to access that information and exclude all the others unnecessary. However, it is no one truth in qualitative research. The knowledge is continuously constructed in nature and evolving (Maxwell, 1992). People are changing their values and therefore information is changing. If we ask a teacher about what s/he believes about the effectiveness of a teaching strategy for his/her students and ask the same question sometime later, it is possible to get different answers due to changing contextual conditions such as different students and different values. Therefore, qualitative inquiry aims to explore these changing conditions in its nature, not the replicability.

CONCLUSION

Even though the purpose of this paper is discussing validity and reliability in both qualitative and quantitative paradigms, the contemporary debate is around the applicability of those constructs in qualitative research. This discussion is due to applying the historical validity and reliability, based on positivism, to interpretivist paradigm based qualitative research. Scholars in inquiry methodology identified this problem and created strategies to meet the interpretivist needs of qualitative research. However, those criteria are still evolving and need more consideration, especially during the design of the qualitative research process. Validity in its positivist definition is still important in qualitative research; however, it needs to be changed to the validity of the process used in qualitative research. 20th century theories, such as critical theory, considered the factors of the research process, participants, values, context, and free expressions of ideas, to reach valid results in qualitative research. Finally, reliability may not be an appropriate criterion for qualitative research due to changing nature of human beings and this needs more debate in the future to clarify the confusion in the literature.

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