

Triangulation of Data Analysis Techniques

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In psychology, as in other disciplines, the concepts of validity and reliability are considered essential to give an accurate interpretation of results. While in quantitative research the idea is well established, in qualitative research, validity and reliability take on a different dimension. Researchers like Miles and Huberman (1994) and Silverman (2000, 2001), have shown how these issues are addressed in qualitative research. In this paper I am proposing that the same corpus of data, in this case the transcripts of focus group discussions, can be analysed using more than one data analysis technique. I refer to this idea as ‘triangulation of data analysis techniques’ and argue that such triangulation increases the reliability of the results. If the results obtained through a particular data analysis technique, for example thematic analysis, are congruent with the results obtained by analysing the same transcripts using a different technique, for example correspondence analysis, it is reasonable to argue that the analysis and interpretation of the data is valid.

INTRODUCTION

In psychology, as in other disciplines, the concepts of validity and reliability are considered essential to give an accurate interpretation of results. While in quantitative research the idea is well

established, in qualitative research, validity and reliability take on a different dimension. Shenton (2004) argues that the trustworthiness of qualitative research is often questioned by positivists, perhaps because their concepts of validity and reliability cannot be addressed in the same way as in naturalistic ways (p.63). However, researchers like Miles and Huberman (1994) and Silverman (2000, 2001), have shown how these issues are addressed in qualitative research. Some researchers who use qualitative methodologies suggest using different terminology to distance themselves from the positivist paradigm. For example, Guba (1981) proposes that qualitative researchers should consider four criteria to increase the trustworthiness of a study. These criteria are (i) credibility (in preference to internal validity); (ii) transferability (in preference to external validity/generalizability); (iii) dependability (in preference to reliability); and (iv) conformability (in preference to objectivity).

Moreover, in the pursuit of reliability and validity of qualitative studies several authors, for example, Patton, (2001), advocate the use of triangulation and state that triangulation strengthens a study by combining methods (p. 247). Golafshani (2003) proposes that triangulation may include multiple methods of data collection as well as multiple methods of data analysis and argues that the methods chosen in triangulation to test the validity and reliability of a study depend on the criterion of the research. There is no 'fix for all researchers' (p. 604). Johnson (1997) also discusses the issue of the use of triangulation in qualitative research and makes reference to work by different authors who discuss strategies to maximize credibility and dependability in qualitative research. A list of these strategies compiled by Johnson includes data triangulation (the use of multiple data sources to help understand a phenomenon); methods triangulation (the use of multiple research methods to study a phenomenon); investigator triangulation (the use of multiple researchers in collecting and interpreting data); and theory triangulation (the use of multiple theories and perspectives to help interpret and explain the data) (p.283). Triangulation of data analysis techniques is here being suggested as another possible strategy.

SOCIAL REPRESENTATIONS AND QUALITATIVE RESEARCH

Various research designs have been used to study social representations. Most often this research is often qualitative in nature. The discussion about triangulation and the validity of qualitative research is therefore pertinent to social representations research. Studies using social representations as a theoretical framework have used different methods to collect data, for example, observation and ethnography (e.g., Jodelet, 1991), word association tasks (e.g., Wagner, Valencia, & Elejaberrieta, 1996) focus groups (e.g., Jovchelovitch & Gervais, 1999), art, such as photography, painting and weaving (e.g., Howarth, 2011) and interviews (e.g., Joffe, 1995). Moreover, researchers have used different tools to analyse data within the framework of Social Representations. While thematic analysis is probably one of the most popular method of analyzing qualitative data, researchers use many techniques including multiple correspondence analysis (e.g., Camargo & Wachelke, 2010), factor analysis (e.g., Green et al., 2003), and discriminant analysis (e.g., Zani, 1993), amongst many others. The possibility of using different techniques in collecting as well as in analyzing data is one of the strengths of the theory of Social Representations (Farr, 1987).

TRIANGULATION OF DATA ANALYSIS TECHNIQUES

Triangulation of sources and triangulation of data are established practices. In this paper I am proposing that the same corpus of data, in this case the transcripts of focus group discussions, can be analysed using more than one research analysis technique. I refer to this idea as ‘triangulation of data analysis techniques’ and argue that such triangulation increases the reliability of the results. If the results obtained through a particular data analysis technique, for example thematic analysis, are congruent with the results obtained by analysing the same transcripts using a different technique, for example correspondence analysis, it is reasonable to argue that the analysis and interpretation of the data is sound.

Photolanguage Used Within a Focus Group Discussion

The research reported in Lauri (2009) and subsequently discussed by Provencher (2011) in her paper 'Lauri on organ donation or how to teach the theory of social representations using a quality empirical study' employs thematic analysis for an in-depth of focus group discussions. This paper describes one phase of the formative research carried out before designing a campaign to increase the number of organ donors in Malta. In order to inform the national organ donation campaign, several data collecting tools were used. These included a national survey and interviews with donors, recipients and doctors involved in organ transplantation as well as focus group discussions. The focus group discussions were enhanced by introducing a photolanguage exercise (Gonzales, 1981) or 'a photo sort' (Gaskell, 2005) at the end of every session. The results of this research were described and analysed in Lauri and Lauri (2005).

According to Gaskell (2005), during focus groups moderators may use free association tasks, pictures, drawings, photographs and even drama as stimulus materials to promote ideas and discussion as a means of getting people to use their imagination and to develop ideas and themes (p.51). In the focus groups under discussion, the participants were asked open ended questions related to organ donation, organ donors and non-donors. Towards the end of the discussion group participants were presented with sixty photographs (8cm x 6cm) of persons from all walks of life and in different environments and contexts. Participants were asked to choose a photo which to them represented a person who would be an organ donor and another one depicting someone whom they perceived as not being willing to donate organs. Following that task, participants were asked to present the photos they chose to the other participants and explain the reasons why they chose those two particular photos. The reasons given by participants for choosing particular photograph were, in fact, attributions of traits or dispositions to the person appearing in the photograph. The role of social representations theory in explaining this type of attribution is discussed at length in chapter 8 of Augustinos and Walker (1995).

In the study being discussed here, when describing why participants chose particular photos, they pronounced statements such as "I think this person would donate because he is wearing a lab coat and would therefore be informed" or, "He is a public figure. He would definitely donate his organs" or "She is old - she would not donate her organs." These statements

were called ‘utterances’ in the paper under discussion. The nature of the photo which a participant chose was mostly important in recording and analysing the adjective or trait which a characterised the utterance and whether it was used to describe donors and non-donors. For example, the above three utterances would be characterised by the descriptives ‘informed’, ‘public figure’ and ‘old’, respectively, and by recording that the first two described a donor while the third described a non-donor. This same exercise within the focus groups was repeated after the campaign to have an indicator of whether the campaign changed perceptions.

Implementing this photolanguage exercise within a focus group had two advantages. The first advantage was the fact that the stimulus material was a set of photographs making it easier for participants to voice their perceptions of personality traits of donors and non-donors without being overly influenced by the stimulus as could happen in word association. Discussions between participants and moderator involved an exchange of ideas enabling the researcher to see things through the eyes of the participants. Social representations theory considers images as rich sources of data. They reveal perceptions, attitudes and beliefs.

The second important advantage, from the point of view of an investigation of social representations, was the context in which this exercise took place. Since it was carried out in a group setting and at the end of a long discussion, the choice of photographs and the reasons given for choosing them would have been influenced by both ‘personal’ and ‘group’ beliefs aired in the focus groups. Meaning is not an individual or a private affair, but is always influenced by the ‘other’, concrete or imagined (Gaskell, 2005, p.45). Whether among a group of friends having a drink in the pub, a group of people holding a discussion at work or a discussion in a focus group, people are influenced in their understanding of issues and concepts and in the production of knowledge. This reflects the proposition put forward by Lahlou (2001) who argues that social representations theory is especially relevant for describing and understanding important issues because it takes into account the feedback loop between social constructionism and individual thought and practice (p.162).

Correspondence Analysis

The focus group discussions carried out before and after the campaign to monitor changes in perceptions of donors and non-donors were analysed using two different and separate techniques, correspondence analysis and thematic analysis.

For the correspondence analysis, all 215 utterances from the photolanguage exercise were recorded. For each, the variable DESCRIPTION recorded the adjective or trait used in the utterance. There were twenty-seven levels corresponding to the twenty-seven adjectives or traits used. The variable DONOR recorded whether the utterance was used to describe a donor or non-donor and whether it was used in a focus group held before or after the campaign (therefore four levels). More details about the procedure used can be found in Lauri and Lauri (2005).

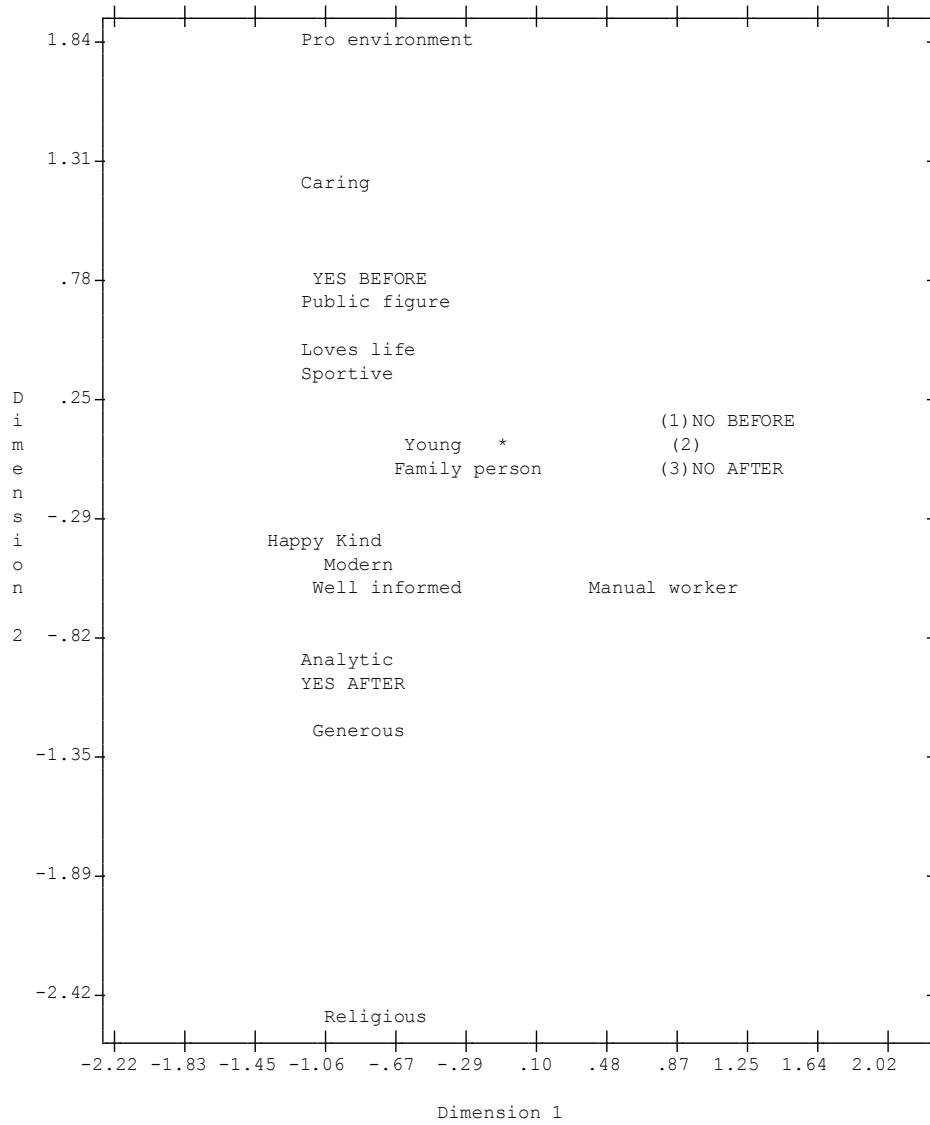
A correspondence analysis of the contingency table between these two variables was then carried out. Three dimensions were extracted in this analysis and, when the scores for the levels of the two variables were plotted along these dimensions, levels which were more similar to each other appeared closer together whereas dissimilar levels appeared far apart. These plots, taken from Lauri and Lauri (2005), are reproduced here in Figures 1 and 2.

The analysis of the results revealed how participants viewed donors and non-donors and how these views changed after the organ donation campaign. Before the campaign, donors were generally perceived to be young people, people who cared about others, who practised a sport, who loved life, who had a professional job and who were pro-environment. Public figures were very often chosen and perceived to be donors. In the focus groups carried out after the campaign, participants selected photos from the same pool. However many of the reasons they gave for choosing particular photos were different. In the post-campaign focus groups, donors were perceived to be persons who had a family, who were educated, analytic and well-informed about current affairs and who could therefore make an informed decision, who were generous and who were religious. After the campaign, some participants associated manual workers with donors. This did not happen during any of the focus groups held before the campaign.

The contingency table between the variables DESCRIPTIONS and DONORS and the positioning of the descriptions within the plots of the scores along the three dimensions also showed up three traits which did not fit in so well within this donor/non-donor dichotomy. These

were Young, Family Person and Manual Worker. Some possible reasons why these three descriptions were not exclusive to either donors or non-donors came out in the focus group discussions themselves and will be discussed below.

Row and Column Scores (Canonical normalization)

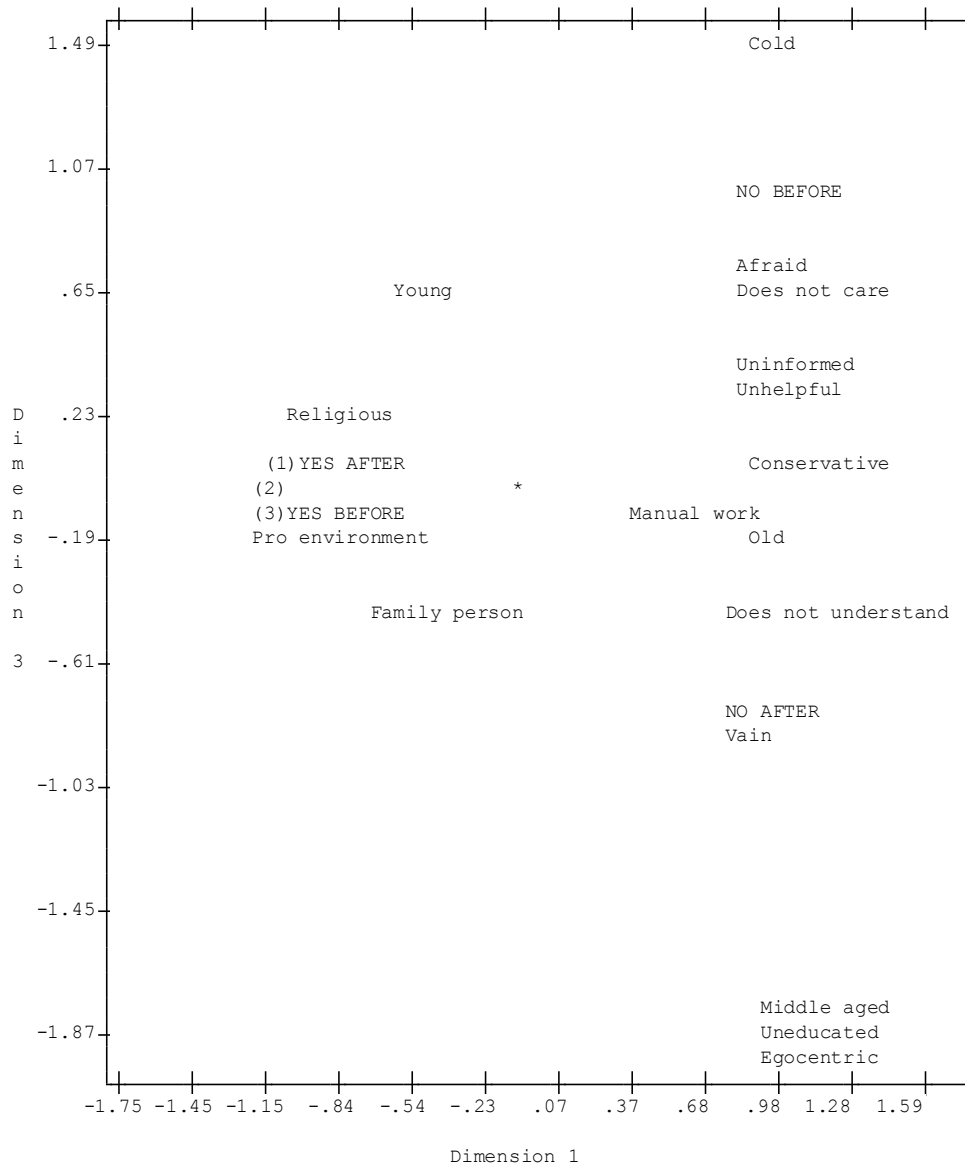


Summary of multiple points in the plot

Point	Actual label
(1)	Cold
(1)	Afraid
(1)	Does not care about others
(1)	Uninformed
(1)	Unhelpful
(2)	Conservative
(2)	Old
(2)	Does not understand
(2)	Vain
(3)	Middle aged
(3)	Uneducated
(3)	Egocentric

Figure 1. Correspondence Analysis – Dimension 1 by Dimension 2

Row and Column Scores (Canonical normalization)



Summary of multiple points in the plot

Point	Actual label
(1)	Generous
(1)	Analytic
(1)	Well informed
(2)	Modern
(2)	Happy
(2)	Kind
(2)	Sportive
(2)	Loves life
(3)	Public figure
(3)	Caring

Figure 2. Correspondence Analysis – Dimension 1 by Dimension 3

Thematic Analysis

We shall now discuss briefly the results of the thematic analysis of the focus group discussions held before the photolanguage exercise. Table 1 gives a summary of the keywords, themes and categories which emerged from this analysis.

Table 1. Focus group discussions: Categories, themes and keywords

Categories	Themes	Keywords
Donors	Informed Public personality Young person Media person Family person Positive personality traits	Airline captain, decided, well read, acquaintance, discussed issue Mary Spiteri, singer, DJ, actress, famous Lively, student, loves music, modern, loves sports DJ radio, newscaster Loves children, religious, gives all, nannu, works, manual worker Considerate, caring, happy, generous, courageous.
Nondonors	Uninformed Parents Old person Negative personality traits	Ignorant, afraid, manual worker Love their children, will not cut up their children Want it their way, different world view, traditional, conservative Egoistic, live for the day, vain, cold, mean, grumpy, couldn't care less, prejudiced

In general donors were perceived to be generous people who were informed about what organ donation involved. Participants attributed positive personality traits to donors. They described such people as knowledgeable, open, and willing to help others. Non-donors, on the other hand were perceived to be older people who were more rigid and set in their ways. Nondonors were also associated with people who were uninformed. A more detailed analysis is

given in Lauri, 2009. These observations were similar to what emerged from the analysis of the photolanguage exercise.

From the thematic analysis clear changes also emerged when comparing the discussions held after the campaign with those held before the campaign. The major change was, as planned by the campaign designers, amongst the participants who looked upon their body as a gift from God. Many people before the campaign were not aware of the Church's position on organ donation and many assumed that it was not condoned by the Catholic Church because it would interfere with resurrection and with going to heaven. In the campaign, information about the positive view of organ donation held by the Church was disseminated widely. This probably was the reason why after the campaign less people looked upon organ donation as an act of disrespect towards the cadaver or as disobeying God's wishes. Donating one's organs took on a new meaning, that of doing God's will, of using the body God gave them to help others, or of repaying in part for having been given a healthy body. Some came to look upon organ donation not as doing charity but as doing one's duty.

Another change was observed amongst those participants who looked upon donors as generous people, willing to help others and to do altruistic acts. After the campaign, the association of organ donation with altruism was sometimes superseded by the notion of organ donation as a duty, something everybody should do.

In the focus groups held before the campaign, there were a number participants who looked upon organ donation as the end of their existence, as the destruction or annihilation of their body and soul. But a change that was observed was that after the campaign, very few people voiced this opinion. On the other hand more people saw organ donors as living on, of extending one's existence by living in another person. Although this representation was not encouraged and was sometimes outrightly denied by doctors speaking in public, the idea still caught on and was popular among the focus group participants. It seems that some ideas catch on without promotion and are resistant to attempts at changing them.

The changes in social representations of organ donation as emerged from the thematic analysis are summarised in Table 2.

Table 2.Changes in the Representations of Organ Donation.

Organ donation perceived less of this	Organ donation perceived more of this
Desecration and disrespect	Giving life
Playing God	Doing God's wish
Butchery and disfigurement	Doing one's duty
Giving a gift	Investment
Recycling	Living on
Disfigurement	
Destruction of identity	

Comparing the Results of the Two Analyses: Reliability and Validity of Results

An interesting pattern came out in the associations between organ donation and the notion of 'Family Person' both in the focus group discussion before the campaign as well as in those carried out after the campaign. There were two contrasting points of view. Some participants focused on the parent, usually a mother, and claimed that since parents love their children tremendously, all parents would be willing to help their children and would therefore be donors. Other participants, on the other hand, claimed that since all parents love their children tremendously they would find it very hard to donate the organs of their children. So while in the first instance, participants were considering parents giving their *own* bodies, in the other group, they were considering parents giving their *children's* bodies. Interestingly, this is reflected in the correspondence analysis since 'family person' did not fit clearly in the donor-nondonor descriptions.

Another description which was used in different ways was 'Manual Worker'. Whereas some participants associated manual worker with being uninformed and hence perceived as a nondonor, other participants were not so categorical. Some claimed that manual workers, having led a more difficult life than professional workers, would be more able to face the challenge of organ donation. Again this was also shown in the diagrams resulting from the corresponding analysis.

This same dichotomy was observed with the adjective 'Young'. Although in general, young people were perceived to be donors whereas old-people were perceived to be nondonors,

some participants when choosing photographs of perceived nondonors, chose photographs of young people who through their appearance gave the impression that they were vain and preoccupied with their image. These, they claimed, would be too egocentric to help others through organ donation.

All three observations were also confirmed by the correspondence analysis of the contingency table between the variables DESCRIPTIONS and DONORS. The fact that both the thematic analysis and the correspondence analysis suggested that the three adjectives young, family person and manual worker did not fit in so well within the donor/nondonor dichotomy is an instance of a finding from the triangulation of data analysis. This, it is being argued, increases the validity of the results obtained. Moreover had the analysis used correspondence analysis only, it would have been more difficult to explain the positioning of these three adjectives in the diagrams.

CONCLUDING NOTE

The positivist paradigm directs the researcher to analyse the world using observable and measurable facts. Researchers working within this paradigm argue that analysing and interpreting qualitative data is subject to biases and therefore may lack reliability or validity. This is an old debate and the argument that qualitative research is fraught with problems of subjectivity of interpretation is by now superseded. Triangulation of data collection methods, investigators, data sources, and theories have been used and found to increase reliability of qualitative studies. In this short paper, it is being proposed that another way of increasing the validity of results derived from qualitative research is the triangulation of data analysis techniques. The study on organ donors and nondonors reported in this paper is an example of how different techniques used to analyse the same text can arrive at a trustworthy study. If triangulation in its various forms is used to differentiate good research from bad research, then its use is important to any research irrespective of the paradigm being used.

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