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QUALITATIVE COMPARATIVE ANALYSIS - AN EXERCISE

Introduction

After the Second World War until the beginning of the 1970's there was a hegemony of quantitative research in Finnish sociology. The 1970's was time of theoretical discussions. It was colored by discussions about the status of Marxian sociology and other tenets in macro sociology.

At the end of the 1970's some of the sociologists started to criticize the hegemony of quantitative research and the macro theoretical orientations. This criticism and new orientation was firstly organized in the project of the study on the change in the Finnish way of life ("Elämäntavan muutoksen tutkimusprojekti") led by J. P. Roos. One of the contributions of this project was to reintroduce qualitative methods to sociologists. As J. P. Roos titled one of his articles the main task of sociology was to change sociology from "oddball research to the study of real life" (Roos 1978).

According to Veronica Stolte-Heiskanen (1992, 294-296) the 1980's was the period of theoretical and methodological variability in Finnish sociology. Nevertheless the main stream sociology was using more widely qualitative methods (e.g.. qualitative interviews and life history analysis) in empirical research. At the same time quantitatively oriented research (above all survey research) seemed to be out of date. The period could be characterized as a decade of "cultural studies". These cultural studies included research of life histories, generations, changes of the way of life of the generation born at the end of the 1940's, changes in the working class culture, and patterns of alcohol consumption. This new paradigm was also criticized by the more quantitatively oriented sociologists. The qualitatively oriented sociology was seen unable to generalize its findings and sometimes it was seen plainly boring. Even if the generalization is not always the greatest problem in qualitative research the critics didn't totally miss the point: there was a certain lack of logical thinking in this research. The interviews and other qualitative material was sometimes only used to color the theoretical ideas.

1. Analytical logic in qualitative research

Until recently a good deal of qualitative research has been too eclectic. The material has not been always properly analyzed. And there was also a good reason for that: there were only few analytical and logical tools for the analysis.

However, the situation has radically changed since the end of 1980's. New ways of analysis have been developed. Among these could be mentioned the use logic based computer programs in analyzing qualitative data (see e.g.. Richards and Richards 1993). Such programs as NUD*IST (developed by Tom and Lyn Richards and others

in Australia) or ATLAS.ti (developed by Thomas Muhr in Germany) simply can't be used without logically defined categories and concepts. For example in NUD*IST hierarchically and logically arranged categories must be used.

Besides computer programs also new methods have emerged just to mention two of them. Firstly there are different new ways of analyzing qualitative event history data referred to as "narrative positivism" by Andrew Abbott (1992). Secondly and more widely usable method is Boolean or qualitative comparative analysis (QCA) analysis developed by Charles C. Ragin (see Ragin 1987). These methods can be used to analyze qualitative data even when "more than a handful of cases" are studied. The former uses a method developed in biology and the latter a method developed in mathematics and electronics.

Using more formal logic in qualitative analysis gives new possibilities for social research. By using logic-based methods the researcher must define the frame (see Ragin 1994) to be used and can also be more certain that the conclusions are based on the evidence there exists. Thus it is possible to define the research problem more clearly and test own thinking in finding conclusions. But there are also some dangers in using methods like QCA. The method can never be purely technical and neutral. The researcher can never give up his or her own thinking and only mechanically follow the method. Instead the evidence should always be looked at very closely - and over and over again - when formulating the problem and making necessary assumption about the data. There is also another possible use for QCA when choosing the cases to investigate. The standard critique of qualitative research refers to the problems of generalizability of its results (see e.g.. Schofield 1993 and Alasuutari 1994). On one hand this critique misses the point because the main task of qualitative research is not always to generalize its findings but to elucidate different mechanisms of possible causal connections (see Alasuutari 1994) or - as Anthony Giddens (1977) expresses - it can at least find "evident causal hypotheses".

But on the other hand the quality of qualitative research could be improved if special attention were given to sampling the cases to investigate (Schofield 1993). Truth tables could be used to define firstly all of the possible and secondly those of the actual configurations of cases to investigate. If all of the possible configurations are not known to the researcher he or she might not choose relevant cases - providing of course that he or she knows what are the main characteristic to be investigated. If they are not exactly known at the beginning of the research constructing of the truth table for possible cases could elucidate that problem. So, it is not always necessary to use any algebra to make use of QCA.

2. The problem

When reading Charles C. Ragin's book (1987) we were astonished about the findings in the analyses: the Boolean analysis really did seem to work. The findings were always surprising and they certainly couldn't have been concluded without this formal looking algebraic method. I became suspicious because the first examples in the book were only hypothetical. We began to think if we were just looking at the "emperor's new clothes".

We were still more suspicious because no one in Finland had ever written anything about this method. However in 1993 Pertti Alasuutari published a new book in qualitative methodology (see Alasuutari 1993a) and there was a short chapter on Boolean analysis.

Alasuutari presented a truth table (below) based on his research on the situations of radio listening. The material was interview data, where interviewees were asked about when and how they listened to the radio - an urgent issues for the broadcasting companies in era of TV, videos and multimedia.

Alasuutari wanted to understand the situations (i) of listening on one hand to news and other documentary (spoken) programs (Y) and on the other hand to music programs (y).

Table 1. The truth table on listening to the radio in Finland (Alasuutari 1993a, 158).

Conditions			The total number of cases	The number cases of listening to the music (y)	The result Y
A	B	C			
1	1	1	14	4	1
1	1	0	8	1	1
1	0	0	4	2	0
1	0	1	0	0	?
0	1	1	10	7	0
0	1	0	2	0	1
0	0	0	0	0	?
0	0	1	4	4	0

The conditions for listening to the radio were

- (1) the person is listening to the radio a) at home or at weekends (A) or b) at work, in a car or in a public place (a),
- (2) listening to the radio is the main mental activity for the person (B) or the radio is listened to only as a secondary activity (b) or as a background sound and
- (3) the person is listening to the radio alone or only passively in the company (C) or in the active group situation (c).

This was a non-hypothetical data we could apply Boolean analysis upon! In the first edition (1993a) Alasuutari was himself applying Boolean analysis only preliminarily (his own comment in Alasuutari 1994) and so we could freely use my knowledge of Boolean algebra and test the possibilities of Boolean analysis (see Luoma 1993).

In this paper I shall do it again and try to elucidate some problems in QCA. After the Oslo Summer School in 15-19 August 1994 I hopefully have more knowledge about the QCA for this secondary analysis exercise.

3. Constructing the knowledge of the truth table and minimizing the truth table

There was mentioned in the lectures that there are more problems in QCA when micro level data is used. There are typical micro level data in the truth table I use and

only part of the data Alasuutari had collected. As he commented (Alasuutari 1993c, 216) he had totally 489 situations and he had analyzed these cases quantitatively in his own research (Alasuutari 1993a). The number of cases in the truth table is only 42. I have no evidence about if the data is or how it is biased. - But this is only an exercise!

4. First conclusions

As can be seen in the truth table there are many counterfactuals or contradictions in the truth table. One way to eliminate these is to use frequencies or probabilities (see e.g.. Ragin 1994, 6). In this case the outcome is seen to be Y if the probability Y's compared to y's is more than 0.5. The most problematic configuration is in the third row where the probability is exactly 0.5. It is possible to look more exactly the primary data of this configuration and conclude that the outcomes of Y are somehow exceptional - as I think Alasuutari did.

Anyway we can start with these assumptions and have the minimized equation for Y

$$(1) Y = AB + Bc$$

This means that news are listened to at home as a main mental activity or as a main mental activity in group situations. The latter term seems to be very interesting because it refers to situations where the news are listened also in group situations - perhaps at work at lunch times!

It is also possible to understand the listening to music by applying de Morgan's rule to the equation (1):

$$(2) y = ab + aC + b + bC$$

As b implicates the terms ab and bC we can drop the latter ones off from the equation and then we have

$$(3) y = aC + b$$

We can try to check the logic of dropping the two terms off by applying de Morgan's rule to the equations (2) and (3).

Table 2. The prime implicants' chart for listening to music (see also table 1).

	Abc	aBC	abC
ab			X
aC		X	X
b	X		X
bC			X

The original term abC seems to be highly over determined, while for the other terms aC and b are necessary implicants. Besides the equation (3) explains all the original configurations for y .

Back to the truth table (table 1). It seems to be possible that the term b explains also the configurations of which there are no evidence (AbC and abc). It also seems to be logical to think that only music - not news - can be listened to as a background voice. Also in our everyday life we can find many situations when music is listened to this way (e.g.. in cars, busses, stores and waiting rooms). However there is one exception to that when music is listened to "at work, in a car or in a public place" (aC) either as a main mental activity or not. This could happen e.g.. in concerts and restaurants.

The results look very logical with one exception: Do the people not listen to music at home as a main mental activity (the term AB)? We know that lots of records and cassettes are bought in the music stores to be listened at home. Maybe the music in the radio is not listened to as a main mental activity at home or during weekends. So we have an interesting hypothesis. The only way to test this is take a closer look at the original data which is not possible here or at the counterfactuals as is done in the next chapter.

5. Counterfactuals

If we take very strict standard we can find four counterfactuals or contradictions (R 's) in the truth table:

$$(4) R(1) = ABC + ABc + Abc + aBC$$

By minimizing the equation above we have equation

$$(5) R(2) = AB + Ac + BC.$$

We need all these terms to cover the original counterfactuals in equation (4).

But what about the non-counterfactual configurations? We can have the equation for non-counterfactual terms in the truth table:

$$(6) r = aBc + abC.$$

Applying de Morgan's rule to this equation we have another equation for the counterfactuals:

$$(7) R(3) = (A+b+C) (A+B+c) = \dots = A + bc + BC$$

This seems to be "more developed" equation for the counterfactuals (ii) compared to the equation (5). However it still looks rather complicated and of course bc and Bc look like counterfactuals. That is why we can - once again - use prime implicants' chart.

Table 3. The prime implicants' chart for counterfactuals.

	ABC	ABc	Abc	aBC
A	X	X	X	
bc			X	
BC				X

According to this chart we can drop off the term bc and so we have "the final equation" for counterfactuals:

$$(8) R(4) = A + BC.$$

This equation tells that one can listen to different radio programs at home or somewhere else as a main activity when passively in the company. More theoretically the first term refers to many different possibilities to do things at home. The second term gives hints of the situations where listening to the radio is actively used as a medium for doing something useful at home and public places: one can listen either to news or to music in situations when active interaction a) is not possible or b) is not wanted by the listener.

The first instance refers to typical situations in the public life where listening to the radio is one of the few things to do. The second instance is theoretically interesting. Many people - especially the young ones - use their radio (e.g., "walkmans" - we couldn't find the correct English word) when walking, jogging, cycling or traveling. It is always possible to concentrate on listening to the radio when interaction with other people is not wanted.

Here we can - for the first time! - refer to Alasuutari's original report (1993b, 43) on the subject where he tells that sometimes "the radio can function as a sound barrier". This barrier or wall set up by listening to the radio - or cassettes - isolates a person effectively from the surrounding world. This method is used specially by some teenagers. They can build the world of their own only by pushing the button of the radio or the cassette player. It is very hard e.g., for the adults to get close to their "heavy metal" or "rap" world.

6. Applying QCA - some conclusions

We have applied QCA to a truth table based on micro level data. The results looked very promising. In spite of the probable bias of the data in the truth table we could make some conclusions as Alasuutari who using all of the data he had collected.

In order to mention these parallel conclusions with some specification we can summarize some of them:

(1) Alasuutari (1993b, 78) concludes in his English summary that "radio listening is almost always a side-activity". This was also shown by using the data in the truth table with an explanation: it is only music listening that is "almost always a side-activity". Listening to news or other documentary programs doesn't seem to be a side-activity but its special prerequisite is higher level of concentration.

(2) Alasuutari (1993b, 30-37) owns a whole chapter for describing radio listening in the workplaces. The farmers very often listen to the radio when driving on a tractor or when working in the dairy barn (iii). The workers listen to the radio when working if there isn't too much noise in the working place (iv). They also listen to the radio in the group situations - in in the rooms with a couple of people working together, in the dressing rooms and in the dining rooms. Very interesting is a quote of an interview where a worker tells: "... we sometimes listen to the news if something interesting is happening in the world. We open the radio when entering the dining room. But normally. ..." (v).

It was concluded in this paper earlier (see equation (1) with interpretations) that radio is listened to in group situations outside home and not during weekends. This seems to be the case according to the original data, too. But, as the interviewee mentioned, this doesn't seem to be a case very often. Anyway, this might be an interesting situation from the point of view of communication theory: the news are sometimes discussed about.

(3) There is some evidence in this paper for the findings by Alasuutari (1993b, 79): "... radio is a lot more an individual medium than television. Unlike television, it is seldom a family medium, ...". Equation (1) doesn't however exclude the situations where the news and documentary programs were listened to as a main mental activity in group situations even at homes (Bc).

(4) The QCA also gave some hints about "the sound barrier" defined by Alasuutari and discussed at the end of the previous chapter.

In summary the analysis of truth table using QCA lead to many same findings as the qualitative analysis of interview data and quantitative analysis of situations. In some cases it also gave a more specified picture of the findings.

According to Charles C. Ragin (1994) it is intelligible talk about social research as representation. There are always different ways to do research and analyze data which all have their merits and dismerits. It is reasonable to try to use also QCA as hopefully witnessed in this paper. It gives logical coherence to the research and even new and refreshing findings based on the qualitative data.

Of course using QCA as any other method in the analysis has to be cautious: the data has to be read in connection with the analysis over and over again in order to confirm - or reject - and elucidate the findings. Above all methodical triangulation could be recommended - once again.

NOTES:

(i) For the simplicity of verbal expression we later speak only about listening to the news. ([back to the text](#))

(ii) Sometimes - as in this case - the Boolean equations deduced straight from the truth table differ from the equation deduced by using de Morgan's rule! So, it seems to be necessary to compare these two equations. ([back to the text](#))

(iii) It is claimed that the cows milk more if they can listen to the music. This can't be confirmed by using only qualitative analysis. ([back to the text](#))

(iv) E.g.. in the barber shops the radio is listened to almost continually, if it doesn't bother the customers wishing to talk. ([back to the text](#))

(v) Music is not usually listened to in the group situations. Some interviewees also announced that they were a bit annoyed when the younger workers listened to the youth music. ([back to the text](#))

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