

# Mixed-method research: synergy of CAQDA and statistical software.

## Example from study on institutional surrounding of schools in Poland.

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### Abstract

Mixed methods research or design (also known as multimethodology, compatibility thesis or pragmatist paradigm) is an increasingly popular approach to research design that combines qualitative and quantitative methods in one research project. In summer of 2011 the Educational Research Institute performed a qualitative study on institutional surrounding of schools in Poland (105 IDI + 24 FGI) in 3 different settings (kindergarten, elementary school and gymnasium) and 8 different counties. Results were transcribed and coded using QDA software. On a later stage of analysis it became clear that a part of the codes that was assigned to different institutions cooperating with the school is suitable for quantitative analysis. It enabled researchers to deploy chi-squared test, V-Cramer's tests, and even correspondence analysis. Results of quantitative analyses led to non-obvious observations, that most probably would go unnoticed otherwise.

### Introduction

Quantitative and qualitative methods are often opposed to each other. Many universities split those two research designs into separate courses. Some academics used to believe, that quantitative and qualitative methods are like fire and ice – cannot be mixed. Mixed methods research or design (also known as multimethodology, compatibility thesis or pragmatist paradigm) is an increasingly popular approach to research design that is opposed to this belief and encourages researchers to combine qualitative and quantitative methods within one research project (Howe, 1988; Creswell & Clark, 2007). This poster is an example of mixed-method approach using CAQDA software and statistical software.

### Results

Analysis in external software enabled three kinds of analyses:

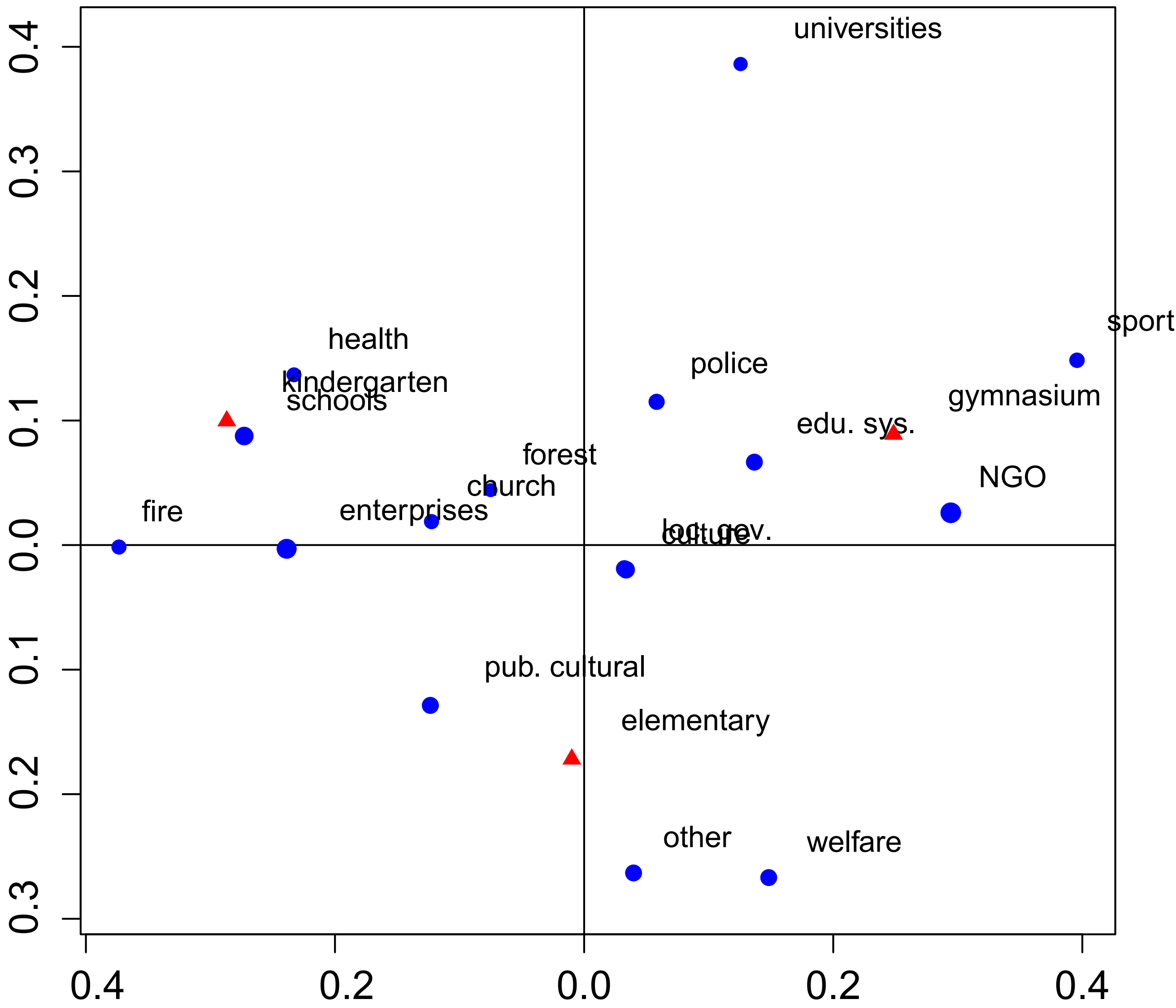
- chi-square test of independence
- V-Cramer's tests of association
- Correspondence analysis

First analysis has shown, that the number of institutions that school cooperates with isn't associated with setting type:  $\chi^2(2, N=773)=5,48; p=n.s.$ , but there is a significant relationship between institution code and setting type:  $\chi^2(30, N=773)=48,04; p<0,05$  (Cramer's  $V = 0,18, p<0,05$ ), which means, that it's not the quantity of institutions that differ between setting, but their quality. Analysis of residuals have shown, that this relationship is chiefly caused by different frequency of cooperation between schools and schools, NGOs, enterprises and sport institutions.

Corresponding analyses performed between code and location have shown both quantitative  $\chi^2(3, N=773)=12,26; p<0,01$  and qualitative  $\chi^2(21, N=773)=2319; p<0,001$  differences – cooperation was more diversified among settings from small cities, especially compared to middle-sized cities. Schools from bigger towns more frequently cooperated with universities and cultural institutions, especially compared to schools in villages. Those latter instead cooperated more frequently with national forests and less frequently with NGOs. Small cities were characterized by frequent cooperation with NGOs and sport institutions.

It also turned out, that there is a significant association between type of institution and respondent's emphasis on describing the nature of cooperation. Principals  $\chi^2(15, N=773)=75,16; p<0,001$  frequently focused on their relationships with schools, church and public cultural institutions, parents were also more keen  $\chi^2(15, N=773)=53,65; p<0,001$  on National Forests.

Finally, a correspondence analysis has been applied to visualize those relationships.



### Method

In summer of 2011 the Educational Research Institute performed a qualitative study on institutional surrounding of schools in Poland (Hernik, Solon-Lipiński, & Stasiowski, 2012). Study consisted of 105 in-depth, semi-structured interviews and 24 semi-structured focused group interviews. Interviews were equally split among 3 different setting types (kindergarten, elementary school and gymnasium) and 8 different counties, which were picked to be representative to all Polish counties. Researchers have used a triangulation of sources to achieve more reliable data – first step was always to interview principals, which helped to pick further respondents: teachers, commune officials and representatives of institutions which cooperate with school. Material has been coded using grounded theory as a framework (eg. Glaser & Strauss, 2009).

At a later stage of analysis it became apparent that it would be valuable to analyse frequencies of codes that were assigned to different institutions that cooperate with school. Researchers were able to create 16 mutually exclusive categories of those institutions among 131 investigated interviews.

To achieve interpretable results each case's name was in fact a combination of informations about location and setting type (eg. LOC1/elementary). Code frequencies were then exported along with this information from CAQDA to external statistical software.

Institution		setting type			Size of locality				parent's emphasis		Principal's emphasis		
		kindergarten	elementary	gymnasium	village	small city	medium city	large city	no	yes	no	yes	sum
other	N	10	22	14	13	15	10	8	38	8	42	4	46
	res.	-1,2	1,8	-0,7	0,9	0,5	0,1	-1,4	0,7	-0,7	1,7	-1,7	
schools	N	32	24	20	19	19	15	23	57	19	51	25	76
	res.	2,6	-0,7	-1,7	0,4	-0,9	-0,4	0,9	-0,8	0,8	-3,5	3,5	
SGU	N	13	17	17	15	10	9	13	37	10	46	1	47
	res.	-0,3	0,1	0,1	1,5	-1,3	-0,4	0,3	0	0	2,9	-2,9	
Church	N	9	9	8	6	11	4	5	13	13	17	9	26
	res.	0,6	-0,1	-0,5	0	1,4	-0,8	-0,8	-3,6	3,6	-2,2	2,2	
culture	N	16	21	21	7	17	4	30	44	14	52	6	58
	res.	-0,3	0,1	0,1	-2,1	-0,1	-2,8	4,6	-0,5	0,5	1,6	-1,6	
public-cultural	N	15	20	13	11	17	10	10	29	19	26	22	48
	res.	0,3	1	-1,2	0	0,9	-0,1	-0,8	-3,2	3,2	-5,1	5,1	
forests	N	5	5	5	7	5	2	1	8	7	13	2	15
	res.	0,3	-0,2	-0,2	2,2	0,3	-0,8	-1,7	-2,4	2,4	0,5	-0,5	
NGO	N	23	42	60	11	46	38	30	104	21	98	27	125
	res.	-2,9	-0,4	3,2	-4,1	1,9	2,7	-0,6	1,4	-1,4	-1,1	1,1	
welfare	N	8	22	16	11	14	14	7	43	3	39	7	46
	res.	-1,8	1,8	-0,1	0,1	0,1	1,6	-1,7	2,5	-2,5	0,5	-0,5	
edusys	N	12	15	20	9	12	10	16	46	1	46	1	47
	res.	-0,6	-0,5	1,1	-0,7	-0,6	0	1,3	3,3	-3,3	2,9	-2,9	
police	N	11	11	15	6	11	9	11	29	8	30	7	37
	res.	0	-0,7	0,7	-1	0	0,5	0,5	0	0	-0,1	0,1	
enterprises	N	41	38	27	39	22	20	25	81	25	98	8	106
	res.	2,3	0,1	-2,3	3,6	-2,2	-0,7	-0,6	-0,6	0,6	3	-3	
sport	N	5	8	16	3	14	8	4	25	4	24	5	29
	res.	-1,5	-0,9	2,3	-1,7	2,2	0,8	-1,5	1	-1	0,1	-0,1	
fire	N	11	9	5	9	6	5	5	16	9	17	8	25
	res.	1,6	0,1	-1,6	1,6	-0,6	-0,2	-0,7	-1,8	1,8	-1,8	1,8	
universities	N	6	3	9	2	4	3	9	16	2	14	4	18
	res.	0,4	-1,7	1,3	-1,2	-0,7	-0,5	2,3	1,1	-1,1	-0,5	0,5	
healthcare	N	10	7	7	10	6	4	4	21	3	20	4	24
	res.	1,3	-0,6	-0,6	2,2	-0,5	-0,6	-1,1	1,1	-1,1	0,2	-0,2	
sum		227	273	273	178	229	165	201	607	166	633	140	773

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