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Why do People Choose to be Silent?
Simulating Electoral Behaviour

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EUROPEAN UNIVERSITY INSTITUTE
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Abstract

This paper investigates opinion contagion in collective behaviour, using an extension of Granovetter's (1978) and Krassa's (1988) threshold models. The theoretical background is the spiral of silence concept developed by Noelle-Neumann (1974), arguing that people only assert their opinions if they perceive a minimal support from a relevant proportion of others. We apply the model to explain the wrong electoral forecasts of the Polish parliamentary and presidential elections in 2005. It is shown that the minority opinions were more widely-held than was declared in opinion polls as a consequence of different distributions of the threshold values of opinion assertion.

Keywords

Spiral of silence, threshold model, electoral forecasts, opinion assertion

Why Do People Choose to Be Silent? - Simulating Electoral Behaviour

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1. Introduction

Park (1930) introduces the term collective behaviour as “the behavior of individuals under the influence of an impulse that is common and collective, an impulse, in other words, that is the result of social interaction.” Elementary forms of collective behaviour are crowd behaviour or social movements, but also voting, innovation diffusion and market behaviour fall into this category. Because of its spontaneous or/and dramatic nature, it is very difficult to predict the level of participation in collective actions.

Public opinion polls have become one of the most important and widely used means of scanning the public mood, as well as its sudden and apparently inexplicable changes on the eve of national elections. There are many “irrational” elements of public behaviour, which account for why electoral prognoses, however objective and impartial, often prove to be grossly mistaken. In her pioneering book, *Die Schweigespirale: Öffentliche Meinung – unsere soziale Haut* (1980)¹ Elisabeth Noelle-Neumann offered a scientific explanation for the formation of public opinion. Her spiral of silence theory has had a great impact on public opinion research, as is shown not only by the numerous theoretical studies which have been published so far but also by attempts to translate the theory into operational models.²

The present paper introduces a simulation developed by Granovetter (1978) and Krassa (1988) to model opinion contagion in collective behaviour, which is a key issue in the spiral of silence theory. The paper is organised in the following way. First, we introduce the basic assumption of the spiral of silence theory. The second part presents the threshold model of collective behaviour. Next we conduct a simulation of the model with different parameters. In section 5 we apply the model to the Polish parliamentary and presidential elections in 2005. Both of them finished with a surprise victory for the Law and Justice Party and, in the case of the presidential elections, Lech Kaczynski. To the very last day before the vote the forecasts indicated a preference of the voters for the opponents, the Civic Platform and its chairman Donald Tusk for president.

We seek to show that the spiral of silence theory can offer an explanation for the wrong forecast.³ We show that it is possible for a public opinion poll to measure a minority

¹ In English see: Elisabeth Noelle-Neumann, *The Spiral of Silence: Public Opinion – Our Social Skin* (Chicago and London: The University of Chicago Press, 1984). For an early version of the theory see: Elisabeth Noelle-Neumann, “The spiral of silence: A theory of public opinion”. *Journal of Communication* (1974), 24, 43-51.

² For an overview of the literature see: Dietram A. Scheufele and Patricia Moy, “Twenty-five years of the spiral of silence: A conceptual review and empirical outlook”. *International Journal of Public Opinion Research* (2000), Vol. 12, No. 1., 3-28. For a discussion of recent debates on the spiral of silence theory see also: Dietram A. Scheufele, “Deliberation or dispute? An explanatory study examining dimensions of public opinion research”. *International Journal of Public Opinion Research* (1999), Vol. 11, No. 1., 25-58.

³ This is of course not by far the only example. The Hungarian parliamentary elections of 2002 likewise finished with the surprise victory of the Socialist Party, although the electoral forecast indicated a victory for FIDESZ (Young Democrats). There are of course many alternative explanations offered for wrong electoral forecasts

opinion as being higher than it is in the real distribution of opinions because of the different distributions of the thresholds of opinion assertion. The spiral of silence theory, on which the applied simulation model is based, starts from the assumption that people *have* their opinions about their political choices but they don't assert them if they don't perceive minimal social support. The campaign is therefore important to mobilize or, on the contrary, silence people who already belong to a given camp. Given the political context of the Polish parliamentary elections which we describe in the paper, we believe that the spiral of silence theory offers a valid explanation for the electoral behaviour observed: namely that people hid their true political opinions from the polls.

We stress, however, that the explanation is valid under certain premises, which are set by the applied model. Bearing in mind these limitations, the last part of the paper discusses the problems of the practical applicability of the model as well as giving a critical evaluation of the theory.

2. The spiral of silence

In a more recent work, Noelle-Neumann differentiates between two concepts of public opinion: (1) public opinion as rationality, which makes it “instrumental... in the process of opinion formation and decision-making in a democracy”; and (2) public opinion as social control, where “its role is to promote social integration and to ensure that there is a sufficient level of consensus on which actions and decisions may be based”.⁴ Noelle-Neumann bases her theory on this second concept of public opinion, and she argues that consensus is motivated by individuals' fear of social isolation.

At this point we limit ourselves to an outline of the assumptions of the spiral of silence theory which are relevant to Krassa's model. According to the analysis of Róbert Angelusz, the spiral of silence is based on the following three assumptions: “1) The majority of people have a quasi statistical perception of the formation of public opinion. 2) Perception of public opinion influences opinion assertion and through this, communication processes. The camp that feels the support of the majority will be more courageous, self-confident and therefore more assertive and visible. The other camp, where the people think that they are in a minority, will, on the contrary, feel insecure and withdraw. Some of them will sooner or later be effectively silenced. 3) This change in communication behaviour will modify the conditions of perception. The withdrawing camp will seem to be smaller, while the more confident camp will appear to be greater than its actual size. This wrong optics of the perception of public opinion will further increase the differences in opinion assertion between the members of the two camps and the wrong perception of the expected formation of public opinion: on the one side we can observe the spiral of silence, on the other side the increasing spiral of opinion assertion.”⁵ Thus, the theory assumes that people do not express their opinion if they do not perceive minimal support from the relevant population groups. This is what Noelle-Neumann calls the spiral of silence: it can happen that the people who hold an opinion A in fact constitute the majority, but in the case of unfavourable communication conditions appear to be the smaller camp. Naturally, a “loud” camp is capable of changing the individual's

such as the impact of the campaign or the remarkably good (or alternatively bad) performance of the leaders of the rival parties. For such an analysis see: Simon Dyson, “Polls apart? The 1990 Nicaraguan and 1992 British General Elections”. *Political Quarterly*, Vol., 65, Issue 4, October 1994, 425-431.

⁴ Elisabeth Noelle-Neumann, “Public opinion and rationality”. In: Glasser, T. L. and Salmon, C. T. (eds.), *Public Opinion and the Communication of Consent* (New York: Guilford, 1995), 34.

⁵ Angelusz Róbert, “Rejtélyes véleményáramlatok: Reflexiók a „hallgatás spirálja” elméletéhez.” In: id. A *láthatóság görbe tükrői: Társadalomoptikai tanulmányok*. (Budapest: Új Mandátum, 2000), 135-136.

perception of public opinion, and thereby they can appear to be bigger than their actual size in a given country or community. The “louder” camp can thus set into motion the spiral of silence, and therefore the camp of the actual majority can *appear* to be in the minority in the eye of the public.

We cannot include here all the many criticisms of the spiral of silence theory.⁶ We only single out two points which are relevant to our later discussion of the use of the threshold model. One is the problem of dual opinion climates, which Noelle-Neumann recognizes but mainly attributes to the influence of the mass media. The question is how people actually perceive public opinion. It can happen that in the individual’s network supporters of opinion *A* constitute the majority, while nationally there is a majority of the supporters of opinion *B*. People in this network can be still convinced that the majority supports opinion *A*, and therefore they can be louder in the local community. Angelusz (2000) distinguishes four types of perception: 1. realistic perception (both camps see their right size); 2. the case of parallel underestimation (both camps perceive themselves to be in the minority); 3. mirror perception (both camps perceive themselves to be in the majority); 4. inverse perception (the majority camp perceives itself to be the minority, while the minority camp perceives itself to be the majority). Both the third and the fourth cases can be explained by the different social networks in which individuals are embedded. It can therefore be very useful to integrate social networks into the model.⁷ Furthermore, there is actually a big difference among the threshold values of individuals, which are dependent on many variables such as age, gender, education, occupation, etc.⁸ In a recent work, Scheufele and Moy (2000) argue that culture can also be an important variable, determining the degree to which individuals are susceptible to perceptions of opinion climates. They argue that in individualistic cultures consistency between private self-image and public self-image is highly valued, whereas in collectivistic cultures individual opinions are more dependent on the social environment. One has to say, however, that many historical examples can be quoted to challenge this dichotomy. (Germany, for instance, belongs to the individualistic cultures, but still public and private opinions differed markedly in the GDR and many other Eastern European socialist countries). They suggest that the phenomenon that Noelle-Neumann calls hardcores or avant-gardes should be taken into account in future empirical research.

3. Threshold models of collective behaviour

Threshold models of collective behaviour are based on the assumption that individual behaviour depends on the number of individuals who already show this behaviour. Granovetter’s (1978) threshold model was a pioneering attempt to formalise this kind of behaviour using the example of riots⁹. The model assumes that individuals are willing to act rationally in order to maximize their utility. “The threshold is simply that point where the perceived benefits to an individual of doing the thing in question (here, joining the riot) exceed the perceived costs.” (Granovetter 1978). Each individual has a threshold such that he or she will act only if a given number of others – defined by a threshold – have already acted. For example, a riot threshold is the percentage of people who join the riot before one would

⁶ For an overview see Scheufele and Moy, op. cit., 2000. For a theoretical criticism of the spiral of silence see Angelusz, op. cit., 2000.

⁷ For a discussion see: Eszter Bartha, “A látható közvélemény és a hálózatok: Adalékok a ’hallgatás spirálja’ elméletéhez”. *Jel-Kép*, 2007/4.

⁸ See, for instance: Dietram A. Scheufele and William P. Eveland Jr. “Perceptions of ‘public opinion’ and ‘public’ opinion expression”. *International Journal of Public Opinion Research* (2001), Vol. 13, No. 1., 25-44.

⁹ For a recent discussion of Granovetter’s model see: Yen-Sheng Chiang, “Birds of moderately different feathers: Bandwagon dynamics and the threshold heterogeneity of network neighbors”. *Journal of Mathematical Sociology* (2007), Vol. 31, 47-69.

also decide to join. A person with 0% threshold would be a leader of a riot: he or she does not need to see other people join before. On the other hand, someone with a high threshold (i.e. 90%) is very unlikely to join the riot. The final number of people who decide to make either of two decisions (here to join the riot or not) depends on the distribution of thresholds in a population. Let's consider 10 people: one with threshold 0, one with 1, one with 2 and so on up to the last with threshold 9. The action is started by an individual with threshold 0, he activates the second with threshold 1 and the final outcome is that all 10 people are activated. But if among these 10 people the distribution of thresholds is different i.e. instead of one with threshold 1, two individuals with threshold 2, the action will cease after the first individual with threshold 0.

An analogous case is the contagion of the public assertion of the opinions. The level of public support from the population that the individual needs for the public assertion of his or her opinion is precisely the threshold value that Granovetter uses in the analysis of riots. The level of opinion assertion thus largely depends on the distribution of the thresholds in a given population.¹⁰ According to Noelle-Neumann, because of the fear of social exclusion people assert their opinion loudly only if they see a minimal level of support from others. Granovetter (1978) and Krassa (1988) acknowledge that people do not perceive public opinion in a "uniform" way. Some attribute greater significance to certain social groups than others and certain groups can even have a contradictory, negative effect: it can happen that some people choose to be silent precisely because certain social groups assert an opinion X.

Krassa (1988) attempts to solve this problem with the help of the ties between people. Every person can be described as being embedded in a particular network, where everyone is connected to everyone else by ties. The strength of these ties depends on the relationship between the two people. The strength of the tie between individuals A and B depends on (1) how important B is from the perspective of A's decision-making, and (2) in a particular case, to what extent A is conscious of B's actions independently of the assertion of his preferences. A possible representation of the ties is by means of two multipliers: (1) the level of consciousness, ranging between 0 and 1, and (2) the significance one attributes to the other in the case of an unlimited interval of hesitation. The tie can then be seen as the product of these two factors, and it signifies how much B's actions count in relation to A's threshold.

By using the above relationships, Krassa builds the concepts of "weighting" and the "network" (which themselves substitute for the more general concepts of selective perception and social groups) into a simulation model. For the simulations we need to assign threshold values to every individual within the population. Further, we need a population-matrix that indicates the strength of the ties between each (direction-oriented) pair within the population. These mutual relationships take into account both the network and the weighting, and so for each *ij* pair they indicate to what extent *i* is informed of the actions of *j* under the condition of a weighting scale that shows the significance of the actions of *j* from the perspective of the decision-making of *i*. We assign an assertion value of 1 to every person who expresses his or her preference, while those who remain silent are given the value of 0. The following formula thus gives the estimation of the social support for a certain cause X:

$$P./i, x = \sum_{j=1}^n (A_j/x) * (E_{j/i,x}) * (N_{j/i,x})$$

where

¹⁰ Michael Krassa, "Social groups, selective perception, and behavioral contagion in public opinion". In: *Social Networks* (1988), 10.

- $P./i,x$ = the proportion of the population, which would assert a preference for cause X according to the calculation of the individual i ;
- Aj/x = the opinion assertion value of the individual j with respect to the cause X, where Aj/x is a dichotomous variable that can take either value 1 or 0;
- $Ej/i,x$ = the significance or the evaluation of the individual j from the perspective of the individual i ;
- $Nj/i,x$ = the social group of the individual j , who are important references to the individual i particularly with respect to the cause X.

This means that within a given population every individual makes a subjective calculation of the proportion of the population that shares a given opinion by adding up the number of individuals who agree with this opinion. Not every individual j is, however, visible to i : this is shown by the formulation $Nj/i,x$, which expresses that every j is included in the “network” of i from which we have to deduct how much i evaluates j , that is to say, what weight i attaches to the opinion of j ($Ej/i,x$). We have to multiply this result by the variable (1,0), which shows whether or not the individuals j express their opinions (Aj/x), and then we have to add these results. This process is repeated for every individual within the given population and in this way we represent how individuals estimate the social support for a certain opinion or cause. This serves as a basis for the individual’s decision¹¹.

Simulations based on the model can produce various interesting dynamics of behavioural contagion (see section 4 and 5). In reality we often have the experience that a certain opinion or idea suddenly captivates the population, or the opposite when enthusiasm rapidly disappears. Simulations can clearly show that no radical opinion change is needed for such phenomena. Let us take the simplest case and examine a population where everybody agrees with a certain opinion, but nobody expresses it under the condition that they all have a threshold value of 1 or above. With this threshold value, it is enough if only one or two individuals start to assert their opinion in public for it to rapidly become popular, once someone starts the process and sets the contagion dynamics in motion.

Similarly, an opposite dynamic can also be observed. Large segments of the population can be silenced - even though their actual opinion does not change – as a consequence of the silencing or elimination of certain key individuals. But the simulations showed that the more complex and fragmented social networks are, the more useless it is to try to change mass behaviour by influencing the behaviour of any individual. With the weakening of networks, individual decision-making reacts less sensitively to the actions of other people. Thus, in a fragmented society it is more difficult to de-mobilize the mobilized population or, on the contrary, to mobilize the silent people. The relationship can be reversed: with a densification of social groups individual decision-making is more influenced by the actions of others and behaviour becomes more collective, not only the indicator of a lucky coincidence.

4. A simulation of the diffusion of opinions

In our model we have two contradictory opinions (A and B) which are present in society in a given ratio. The use of two opinions instead of one is explained by the fact that in this way the opinions can be interpreted as preferences for one of the two major rival parties competing in an election.

¹¹ The mathematical introduction of the model is taken from Krassa (1988).

For the perception of the ratio of opinions we do not take into account the fact that the opinions of different people are perceived by a given person with different weights. We give the same weight to every single opinion perceived.

The simulation creates a population of 10,000 people, and in the first step one of the opinions, either A or B, is assigned to each member of the population with the proper probability according to the given parameters. Every person is also assigned a threshold level which indicates the minimal ratio of people sharing the person's opinion that must be perceived by the person to make him publicly assert his opinion. This ratio can be interpreted in two different ways: we might see it as either the proportion of people asserting the given opinion within the whole population, or alternatively as the proportion within those who express any opinion at all. As the models using the first interpretation usually die out quickly, due to their nature, we mainly use the second interpretation. That is, we compare the threshold level to the proportion within the visible opinions.

The simulation itself is the iteration of one step: the people who have a lower threshold level than the proportion of people sharing this opinion in the previous step will assert their opinions, the other people will not. **The opinion of each person is given and constant from the beginning.** This premise can of course be problematic in a "real-life" campaign situation. The spiral of silence theory, however, *presupposes* that people have their opinion, only that they don't assert it if they don't feel a certain level of social support.¹² The impact of the campaign is, however, taken into account insofar as the visibility of each camp influences people to assert, or, on the contrary, hide their opinions.

The proportion of people asserting each opinion at a given moment thus depends on the proportion of people asserting the given opinion in the previous moment, and on the distribution of the threshold levels within the group of people sharing the given opinion.

$$P_t = f(P_{t-1}, F(V_i)) \quad (2)$$

Where P_t and P_{t-1} stand for the ratio of people asserting a given opinion in the t -th and $(t-1)$ th moment (that is, the probability of asserting one's opinion), and $F(V_i)$ is the distribution function of the threshold levels of those who share the i -th opinion. The threshold levels can be interpreted as percentages, with the threshold value for each person generated by a random number generator from a uniform distribution between 0 and 100 percent by default. The input parameters of the model are the proportion of each opinion and the minimum and maximum values of the threshold distributions for each group of people with different opinions separately, so that the willingness to express opinions can be different in the two groups. When modifying the distributions of the threshold levels, we always take care that the difference between the maximum and the minimum value should be equal in the two opinion-groups. This is necessary to ensure that the height of each density function is equal.

When we choose equal parameters of the threshold distributions in the two opinion groups, the simulation leads to the result that people with the minority opinion will be silent after a few steps, and the opinion of the majority will be the only visible opinion, regardless of the specific distribution of the opinions. Figure 1 presents the situation with a distribution of opinions 30:70 and with the same threshold max and min for both groups (80, 20).

¹² The limitations of the model are discussed in the last, concluding section.

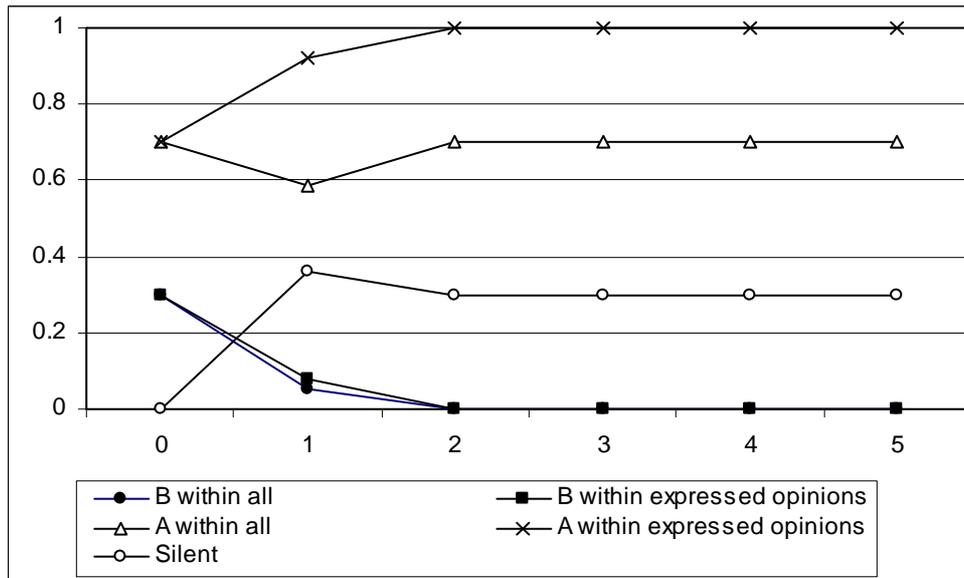


Fig. 1 Simulation of the diffusion of opinions for distributions 30:70 and the same thresholds 80,20.

More interesting dynamics can be observed in the models where the distribution of the threshold levels is different in the two opinion groups.

Opinion	Proportion	Threshold Max	Threshold Min
(A)	30	60	0
(B)	70	100	40

In this model the distribution of opinions is 30:70, and there is a great difference in the distribution of threshold levels between the two groups. People with the minority opinion A are more willing to assert their opinions, because they need a lower level of support. As the maximum of the threshold distribution is 60 percent, there is no person with opinion A who would remain silent if he perceives that at least 60 percent of the asserted opinions agree with his opinion. On the other hand, people with the majority opinion B need much more public support to express their opinions. In this group, the threshold levels are distributed between 40 and 100 percent. That is, if their opinion is not supported by at least 40 percent of the opinions observed, every person with this opinion will be silent.

With these parameters, the dynamics of the expressed opinions will go as shown in Figure 2. The number of persons with majority opinion B asserting their opinion – because of their lower willingness to do so – will decrease step by step, while more and more members of group A will assert their opinions, due to the decreasing proportion of the majority group. In the end, the minority opinion will completely win over the majority, and opinion A will be the only opinion observable.

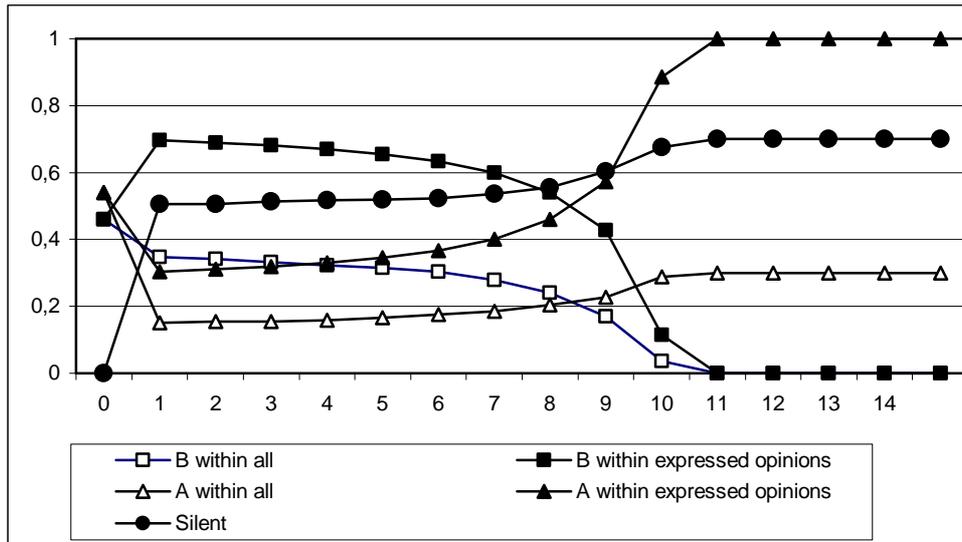


Fig. 2 Simulation of the diffusion of opinions for proportion 30:70 with different threshold distributions.

In the next section we will demonstrate the applicability of the model in practice, with political examples related to the Polish elections of 2005.

5. Polish Presidential and Parliamentary elections in 2005 – a failure of the forecasts

Parliamentary elections for both houses of the Parliament of Poland were held on September 25, 2005. The election resulted in a sweeping victory for two parties of the centre-right, the conservative Law and Justice (PiS) and the liberal-conservative Citizens Platform (PO) with a voter turnout of 54%. The incumbent centre-left government of the Alliance of the Democratic Left (SLD) was defeated. The two victorious parties won 288 out of the 460 seats, while the SLD won only 55 seats. The PiS won 155 seats while the PO won 133 (see Table 1). PiS leader Jarosław Kaczyński declined the opportunity to become Prime Minister so as not to prejudice his twin brother Lech Kaczyński's chances in the Presidential race.

The Sejm is elected by proportional representation from multi-member constituencies, with seats divided among parties which gain more than 5% of the votes using the d'Hondt method. The Senate is elected under first-past-the-post bloc voting.

Parties	Votes	%	Seats Sejm	+/-	Seats Senate
Law and Justice (Prawo i Sprawiedliwość, PiS)	3,185,714	27	155	111	49
Civic Platform (Platforma Obywatelska, PO)	2,849,259	24.1	133	68	34
Self-Defence of the Republic of Poland (Samoobrona RP)	1,347,355	11.4	56	3	3
Democratic Left Alliance (Sojusz Lewicy Demokratycznej, SLD)	1,335,257	11.3	55	-161	-

League of Polish Families (Liga Polskich Rodzin, LPR)	940,726	8	34	-4	7
Polish People's Party (Polskie Stronnictwo Ludowe, PSL)	821,656	7	25	-17	2
Social Democracy of Poland (Socjaldemokracja Polska, SDPL)	459,380	3.9	-		-
Democratic Party (Partia Demokratyczna)	289,276	2.5	-		-
Janusz Korwin-Mikke Platform (Platforma Janusza Korwin-Mikke, PJKM)	185,885	1.6	-		-
Patriotic Movement (Ruch Patriotyczny)	124,038	1.1	-		-
Polish Labour Party (Polska Partia Pracy, PPP)	91,266	0.8	-		-
German Minority Electoral Committee (Komitet Wyborczy Mniejszość Niemiecka)	34,469	0.3	2		
Independents					5
Total (turnout 40.6 %)	11,804,676		460		100

Table 1. Summary of the 25 September 2005 Sejm and Senate election results

Although both leading candidates came from the centre-right, and their two parties had planned to form a coalition government following the legislative elections on 25 September, there were important differences between Tusk and Kaczyński. Tusk was considered somewhat more socially and economically liberal, favouring more rapid European integration and a free-market economy. Kaczyński was seen to be more socially conservative and more suspicious towards the European Union.

The BBC commented on election day: “The two centre-right parties are both rooted in the anti-communist Solidarity movement but differ on issues such as the budget and taxation. Law and Justice, whose agenda includes tax breaks and state aid for the poor, has pledged to uphold traditional family and Christian values. It is suspicious of economic liberalism. The Citizens Platform strongly promotes free market forces and wants to introduce a flat 15% rate for income tax, corporation tax and VAT. It also promises to move faster on deregulation and privatization, in order to adopt the euro as soon as possible”. Partly due to these differences, negotiations between PiS and PO about forming the new government collapsed in late October. The end of talks was also affected by the 9 October presidential election, where the PiS victor Lech Kaczyński was the twin brother of the PiS leader Jarosław Kaczyński.

Presidential elections were held in Poland on 9 October and 23 October 2005. The campaign was fought primarily over a domestic agenda, as Poland struggled with huge unemployment (20% or more in some areas), a widening gap between rich and poor, and a series of corruption scandals involving a number of highly-placed civil servants, politicians, and business executives. The public mood was a mixture of disgust, anger, and deep concern about the future. In this situation, the PiS could successfully mobilize voters with the promise of a “moral revolution”.

This was, however, less than obvious. During the first round, in which voter turnout was 49%, neither Tusk nor Kaczyński received 50 percent of the votes. One week before the second round (23 October), a forecast predicted a Tusk victory (preference: Tusk 54%, Kaczynski 46%). Eventually, however, it was Kaczyński who defeated his opponent, getting 54.04 % of the vote (see Table 2). Voter turnout was 51%.

Candidates and nominating parties	Votes 1st round	%	Votes 2nd round	%
Lech Kaczyński - Law and Justice	4,947,927	33.1	8,257,468	54.04
Donald Tusk - Civic Platform	5,429,666	36.3	7,022,319	45.96
Andrzej Lepper - Self-Defence of the Republic of Poland	2,259,094	15.1	-	-
Marek Borowski - Social Democracy of Poland	1,544,642	10.3	-	-
Jarosław Kalinowski - Polish Peasant Party	269,316	1.8	-	-
Janusz Korwin-Mikke – Real Politics Union	214,116	1.4	-	-
Henryka Bochniarz - Democratic Party	188,598	1.3	-	-
Liwiusz Ilasz	31,691	0.2	-	-
Stanisław Tymiąski - All-Polish Citizens Coalition	23,545	0.2	-	-
Leszek Bubel - Polish National Party	18,828	0.1	-	-
Jan Pyszko - Organization of the Polish Nation - Polish League	10,371	0.1	-	-
Adam Słomka - The Polish Confederation-Freedom and Work	8,895	0.1	-	-
Total (turnout 49.7 %)	15,046,350	100		

Table 2. Summary of 9 October 2005 Polish Presidential election results

Both parliamentary and presidential results were a surprise as the official poll institutions to the very end indicated a voter preference for Civic Platform and its chairman Donald Tusk for president. In Figures 3 and 4 the trends of voter preferences in the parliamentary and presidential elections are shown (the mean value of 4 main opinion

research agencies¹³). The polls of each of the agencies were conducted on a representative sample of 1000 adult Poles. The maximum statistical error for such a sample is +/- 3.2%. Most of the surveys were conducted by interviewing people in their homes or calling them on the phone (mobile or private). The PGB survey collected information by face-to-face interview conducted in public places.

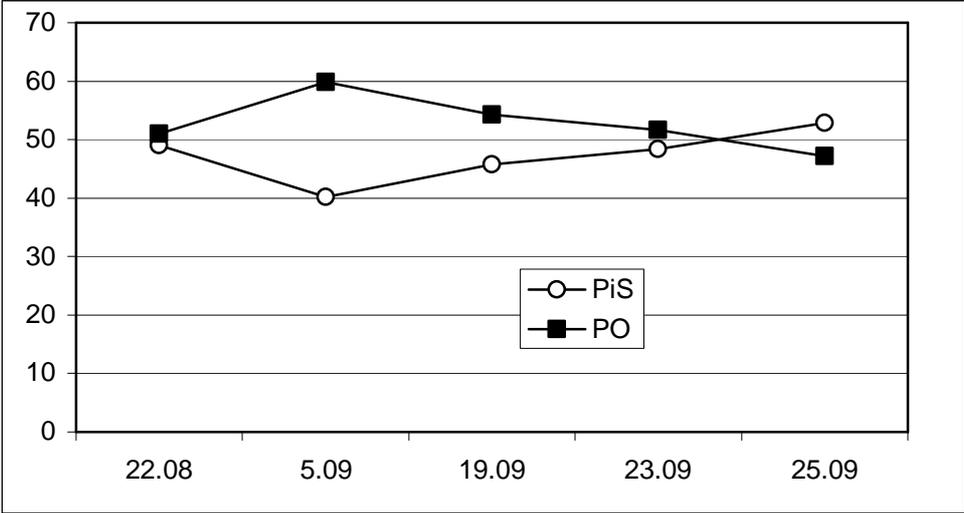


Figure 3. Voter preferences in the parliamentary elections

From the beginning of August all the research institutions estimated that the PO would win. The situation changed 2 days before the elections and the last official forecast was: PiS 33, PO 28.7.

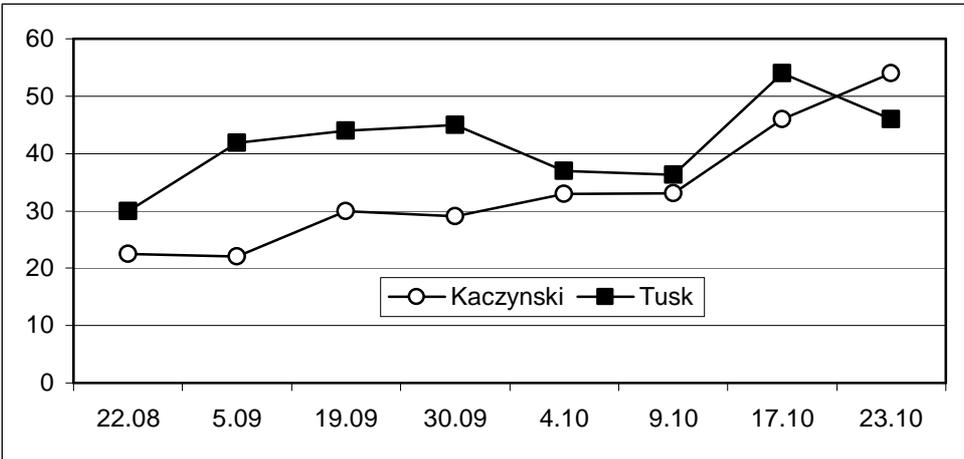


Figure 4. Voter preferences in the presidential elections

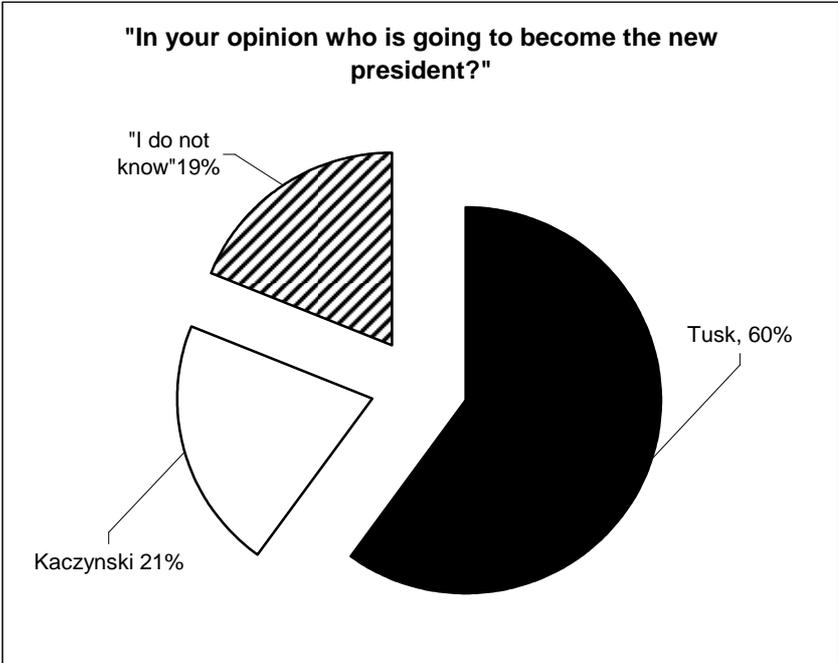
If we consider the presidential election, we face a similar situation. The first round finished with similar results to those predicted by the research institutes. The greatest forecast

¹³ OBOP (The Public Opinion Centre), CBOS (The Public Opinion Research Centre), GFK Polonia, PGB (Polish Research Group).

failure concerned the second round of the presidential elections. Preferences according to the mean value of surveys of the main agencies a week before the second turn were as follows: Tusk - 54%, Kaczynski - 46%. PGB was the only institute that correctly predicted the election of Lech Kaczyński, giving him 50,2% on the day before the election.

It was the first time in post-1989 Poland that the opinion poll institutes had been so mistaken. The error was about 20% for both the parliamentary election and the second round of the presidential elections. It is not unusual for polls to get the margin of victory wrong, but it is unusual for them to mispredict the winning party or candidate. Because most agencies did not correctly determine the winner, in the Polish media they were even accused of manipulation. Pollsters tried to explain the failure of the forecast by saying that people decided on the last day, arguing that many of the interviewees were not too sure themselves how they would vote. This group was estimated at between 11 and 19%. The failure of the polls to make the right prognosis was also explained by an error in the sampling method: telephone interviews were claimed to overestimate supporters of Tusk and the PO.

However, with the help of the spiral of silence theory, we can give an alternative explanation of the wrong forecast. We argue that because of the strong conservative character of PiS and Kaczynski it is unlikely that people who decided to vote for them made up their mind on the last day. Instead, they preferred not to tell their true opinion to the pollsters, a behaviour which can be explained through the spiral of silence. Tusk and Civic Platform had greater visibility because they were preferred by the media. Justice and Law and Kaczynski, on the contrary, were represented as a party of the bigoted, uneducated and old “village” people. It is reasonable to assume that people were reluctant to admit their preference for a “backward” party. Our argument that the majority preference was perceived as **minority** is supported by the official surveys (Figure 5).



Source: CBOS, survey conducted between 13 and 16 Oct 2005 on a representative sample of 1003 adult Poles, see more at <http://cbos.pl>

Figure 5. “Who is going to win the presidential election?”- survey of voter predictions

One week before the second round of the presidential elections only 21% of the respondents believed that the winner would be Kaczynski. According to the measured social perception, the probability of a Tusk victory compared to a Kaczynski victory was 3 to 1. Indeed the winning candidate was perceived to have minority support. .

6. The Power of Silence? The application of Krassa's model to the Polish elections of 2005

The failure of the forecast of the Polish elections of 2005 will be explained with the help of the simulation model developed by Krassa. Our assumption derives from the spiral of silence theory: that people surveyed tend to hide their opinion if they do not perceive social support of the appropriate level.

We start the analysis from the parliamentary elections. We repeat the procedure of the simulation conducted in section 4. We assume that the factual ratios of party preferences during the period before the elections were equal to the ratios of the votes for the party lists observed in the elections. The two opinions in the model correspond to preferences for one of the two leading political parties, Law and Justice and Civic Platform (preferences for other parties are not considered here). The ratio of the votes for the party lists was: 52,8 for PiS and 47.2 for PO. We assign different threshold distributions among supporters of the two parties.

Opinion	Proportion	Threshold Max	Threshold Min
PO	47.2	48	23
PiS	52.8	55	30

We assume that PO voters are more willing to assert their opinion and have a lower minimum threshold. Figure 6 presents the results of the diffusion of opinions. At step 2 the proportion of PO voters with an expressed opinion exceeds that of PiS voters. This leads to a situation in which the minority opinion might seem to have absolute hegemony (from step 7).

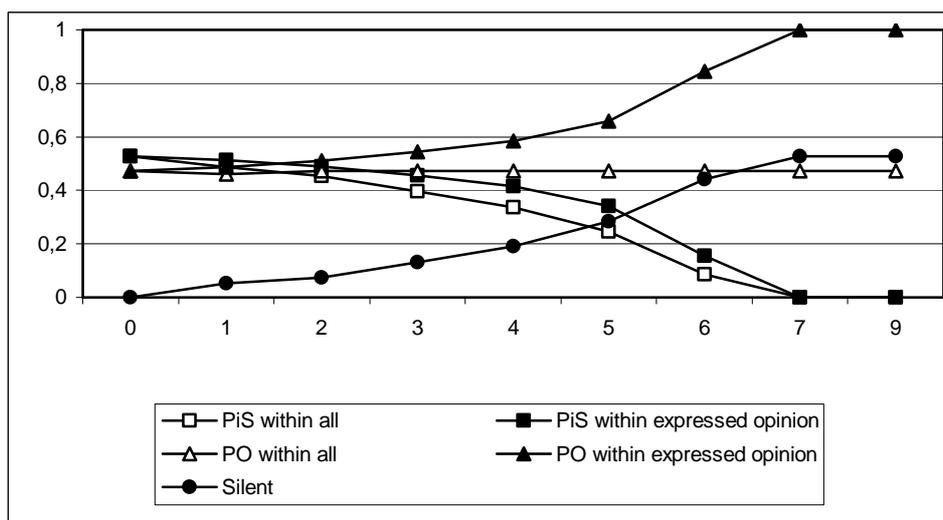


Figure 6. Threshold simulation of the diffusion of opinion for the parliamentary election

Now we turn to the presidential election. In these models we again accept the results of the elections as the real distribution of opinions. Our steps show what could have happened

before the final day of voting. We use the model only for the second round of the election, which ended with a significant failure of the forecast. The results were 46% for Tusk and 54% for Kaczynski, while the poll institution estimated the opposite. We estimate the model with three different threshold distributions.

Opinion	Proportion	Model	Threshold Max	Threshold Min
Tusk	46	1	50	20
Kaczynski	54		60	30
Tusk	46	2	48	18
Kaczynski	54		56	26
Tusk	46	3	48	8
Kaczynski	54		56	16

We start from model 1, assuming that the thresholds for Tusk are normally distributed between 50 and 20, and for Kaczynski between 60 and 30. Supporters of Kaczynski having a higher minimum threshold are more reluctant to express their opinion openly. The diffusion of opinion is shown in Figure 7. After a few steps, the proportion of Tusk voters expressing their opinion clearly exceeds Kaczynski’s supporters. If we consider the 2nd step in figure 7 (Tusk 54%, Kaczynski 46%), it perfectly reflects the measured voter preferences one week before the second round (Fig. 4). Additionally, the silent group of 17.4% corresponds to the voters who answered “I do not know” in the surveys. The situation is very similar to the model of the parliamentary elections. Both models, with characteristic input parameters, successfully explain the wrong election forecasts.

In the second model, we keep the same range of thresholds but change their distribution. Kaczynski’s voters have a lower level of minimum threshold and thus are more eager to express their support. Figure 8 presents the results. Here we have a very stable pattern of percentage distribution of voters between the two candidates. The model does not explain the change of leading candidate.

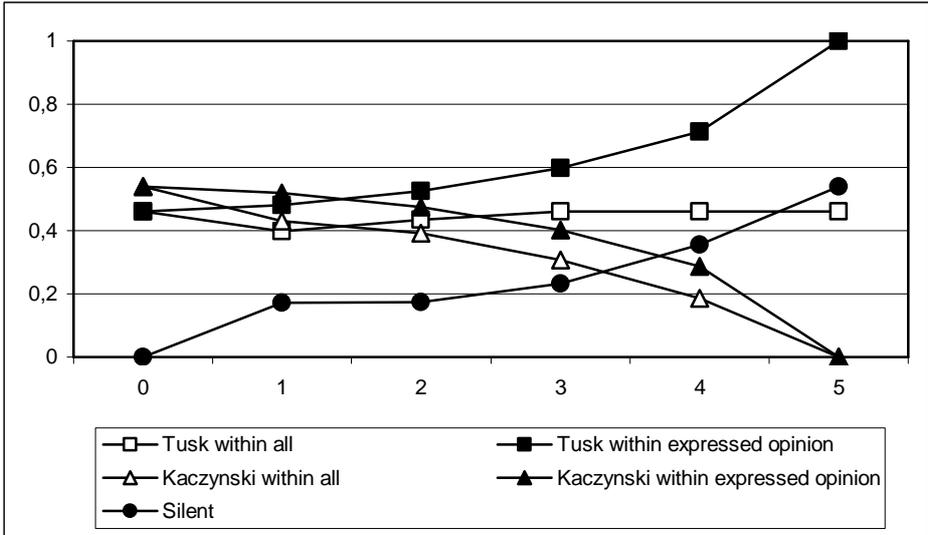


Figure 7. Threshold simulation of the diffusion of opinion for the presidential election (model 1)

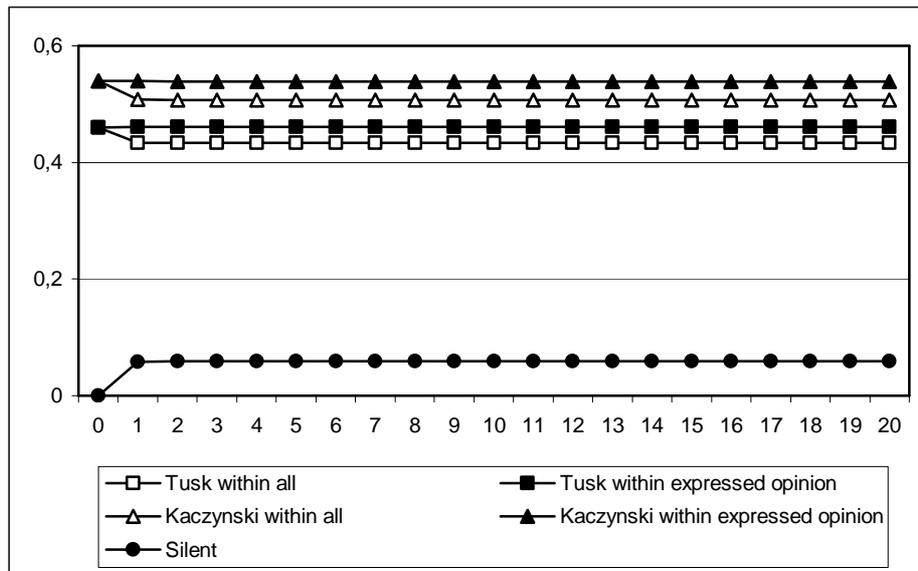


Figure 8. Threshold simulation of the diffusion of opinion for the presidential election (model 2)

Finally, we estimate the third model with a bigger range between the minimum and maximum thresholds. As we can see from Figure 9, Kaczynski assumes the leading position, but after more steps than in the first model.

We have shown that the wrong forecast for the Polish elections of 2005 can be explained with the help of Krassa's simulation model. With respect to the empirical use of the model, we must however remember that the actual distribution of thresholds within the population is unknown.

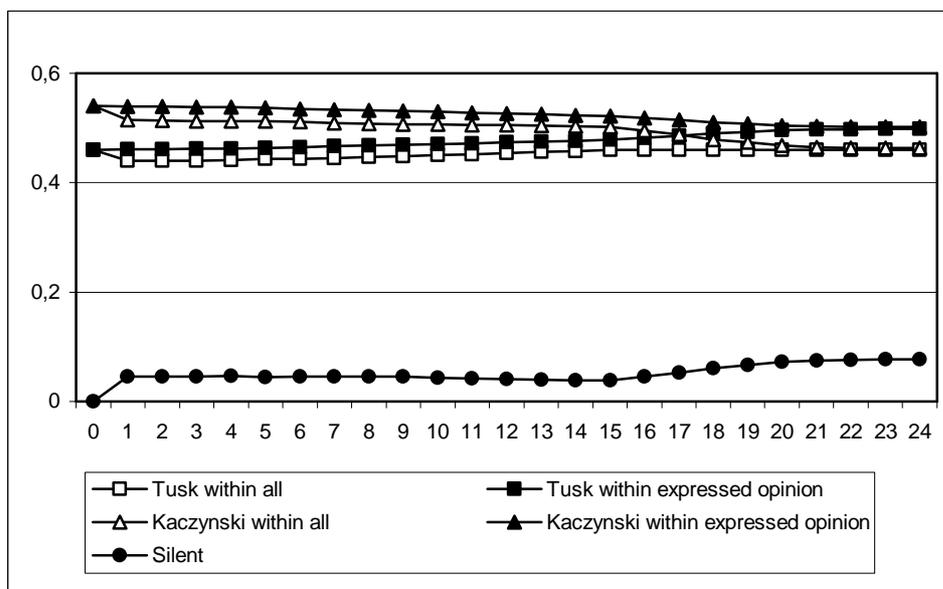


Fig. 9 Threshold simulation of the diffusion of opinion for the presidential election (model 3)

7. Discussion and conclusion

The results of the threshold model provide a potential explanation of how the opinion research institutions could forecast a win for the wrong party/candidate, apart from conspiracy theories or motives of manipulation. We have shown that given an assumed hypothetical threshold distribution within a given population, it is possible to give a higher estimate than the actual size of a camp.

Concerning both the practical applicability of the model and its theoretical assumptions however, we can raise some criticisms.

First, our simple model does not take into account the network distribution of the perception of opinions, namely that individuals do not uniformly perceive the distribution of opinions. The perception of individuals is thus influenced by the distribution of opinions that they see in their own social networks. In order to expand our model, it would be important to take into account “dual opinion climates”, which can result in what Róbert Angelusz calls “optical misperceptions” (2000a).

The second problem is that the relationship between a tie and opinion dynamics is not so direct and obvious as the model assumes. It can happen that A is a good friend of B but it does not matter to A whether or not B supports the X cause because A considers B to be a born loser. At the same time A can be influenced by a person whom he or she has never met (e.g. a television reporter, politician or football player). A further practical difficulty is the identification of the social groups in A’s network which negatively influence his opinion assertion. In reality, it can happen that precisely those individuals connected with strong ties have a negative effect on each other (the most typical case is the revolt of sons against fathers). Moreover, the model makes no distinction between strong and weak ties. Note that whether contagion is faster in the case of stronger or weaker ties is questionable. Chwe (1999) shows that a strong-tie structure is advantageous while Macy (1991) finds the contrary. Yen-Sheng Chiang (2007) adds that not only is the strength of ties important, but also the threshold values of neighbours. He finds that at the beginning participation levels increase when neighbours have different thresholds, but a further increase in the heterogeneity of neighbour networks causes the diffusion of opinion to stop.

Furthermore, it is not necessarily true that willingness to express an opinion depends exclusively on perceived social support. The hypothesis that opinions are constant is likewise problematic. In the model, the change in the perceived distribution of opinions was only the result of a change in the proportion of people who expressed this opinion – while the ratio of actual supporters did not change. In reality, people’s opinions change as well.

Last, with respect to opinion assertion, the model assumes that if people are willing to assert their opinion, they will say what they actually think – although in public opinion polls the separation of public and private opinions is a well-known phenomenon, when under a certain normative pressure individuals assert in public an opinion different to their internal conviction, to which they listen when they actually vote.

Apart from theoretical criticisms of the spiral of silence theory, if we want to apply Krassa’s model the main technical difficulty is in determining the actual distribution of thresholds. We know neither the distribution function of the thresholds of opinion assertion nor the differences in the function between the two opinions. In the case of adoption of innovation, the threshold distribution is measured according to the exact exposure time of adoption (Valente 1999). Moreover, thresholds might not be constant in time, for example voter preferences can be drastically changed as the result of new information. That is why the model should be treated as dynamic.

Finally, it can be also questioned whether people’s behaviour is contingent on others or is influenced by some exogenous factor as in the case of umbrellas: "Thus, if at the

beginning of a shower a number of people on the street put up their umbrellas at the same time, this would not ordinarily be a case of action mutually oriented to that of each other, but rather of all reacting in the same way to the like need of protection from the rain" (Max Weber [1921]1968, pp. 23).

We believe that further development of threshold models is possible only through multidisciplinary research. The need for a combination of quantitative and qualitative methods, which would take into account not only the complex relationship between ties and opinion dynamics but would also consider the wider social context, is beyond doubt. While simulations operate in a context-free (or "controlled") environment, in reality where and which cause is supported by a "visible" majority is of no little consequence.

References

- [1] Allport, F.H.(1924), *Social Psychology*, Boston: Houghton Miffling.
- [2] Angelusz R. (1983), *Kommunikáló társadalom*, Budapest: Gondolat.
- [3] Angelusz R. (2000a), A pluralizmus paradoxonai In: id.. A láthatóság görbe tükrei: Társadalomoptikai tanulmányok, Budapest: Új Mandátum.
- [4] Angelusz R. (2000b), Rejtélyes véleményáramlatok: Reflexiók a "hallgatás spirálja"elméletéhez, In: id. A láthatóság görbe tükrei: Társadalomoptikai tanulmányok, Budapest: Új Mandátum, pp. 135-136
- [5] Angelusz R. (2002), Közvéleménykutatások és a pluralizmus ignoranciája In: id.. A láthatóság görbe tükrei: Társadalomoptikai tanulmányok, Budapest: Új Mandátum.
- [6] Angelusz R., Tardos R. (eds.) (1991) *Társadalmak rejtett hálózata* Budapest: Magyar Közvéleménykutató Intézet.
- [7] Bartha E. (2007), A látható közvélemény és a hálózatok: Adalékok a 'hallgatás spirálja' elméletéhez. *Jel-Kép*, 2007/4.
- [8] Chiang Y-S. (2007), Birds of Moderately Different Feathers: Bandwagon Dynamics and the Threshold Heterogeneity of Network Neighbors *Journal of Mathematical Sociology*, 31:47–69,
- [9] Chwe, M., (1999), Structure and strategy in collective action, *American Journal of Sociology*, 105(1), 128–156.
- [10] Dyson S. (1994), Polls apart? The 1990 Nicaraguan and 1992 British General Elections, *Political Quarterly*, Vol., 65, Issue 4, October 1994, 425-431.
- [11] Granovetter M, (1973), The Strength of Weak Ties, *The American Journal of Sociology*, Vol. 78, No.6, pp. 1360-1380.
- [12] Granovetter M, (1978), Threshold models of collective behavior, *American Journal of Sociology*, Vol. 83, No. 6, pp. 1420-1443.
- [13] Katz E., Lazarsfeld P. F. (1955): *Personal influence*. New York: Free Press.
- [14] Krassa, M (1988), Social groups, selective perception, and behavioral contagion in public opinion, *Social Networks* 10, pp.109-136
- [15] Lazarsfeld P. F., Berelson B., Gaudet H. (1948): *The People's Choice: how the voter makes up his mind in a presidential campaign*. New York: Columbia University Press.
- [16] Macy, M. (1991). Chains of cooperation: threshold effects in collective action. *American Sociological Review*, 56, 730–747.
- [17] Newcomb, Th. M. (1950): *Social Psychology*, New York: The Dryden Press.

- [18] Noelle-Neumann E. (1974) *The Spiral of Silence: A Theory of Public Opinion*, *Journal of Communications*, 24.
- [19] Noelle-Neumann E. (1980) *Die Schweigespirale: Öffentliche Meinung – unsere soziale Haut* (in ang.: *The Spiral of Silence: Public Opinion – Our Social Skin* (1984), Chicago and London: The University of Chicago Press).
- [20] Noelle-Neumann E. (1995) “Public opinion and rationality”. In: Glasser, T. L. and Salmon, C. T. (eds.), *Public Opinion and the Communication of Consent* (New York: Guilford), 34.
- [21] O’Gorman H. (1975) Pluralistic ignorance and white estimation of white support for racial segregation, *Public Opinion Quarterly* 39.
- [22] Park R.E, (1930), *Collective Behavior*, pp. 631-633 in *Encyclopedia of the Social Sciences*, vol. 3, edited by Seligman Edwin R.A.. New York: Macmillan, 1st edition
- [23] Scheufele D.A. (1999), *Deliberation or dispute? An explanatory study examining dimensions of public opinion research*, *International Journal of Public Opinion Research* (1999), Vol. 11, No. 1., 25-58.
- [24] Scheufele D.A., Moy P. (2000), *Twenty-five years of the spiral of silence: A conceptual review and empirical outlook*, *International Journal of Public Opinion Research* Vol. 12, No. 1., 3-28.
- [25] Scheufele D.A. Eveland W. (2001), *Perceptions of ‘public opinion’ and ‘public’ opinion expression*, *International Journal of Public Opinion Research* Vol. 13, No. 1., 25-44.
- [26] Taylor, D. Garth (1982), *Pluralistic ignorance and the spiral of silence: A formal analysis*, *Public Opinion Quarterly* 46.
- [27] Valente T.W (1996), *Social network thresholds in the diffusion of innovations*, *Social Networks*, No 18, pp, 69-89.
- [28] Weber M. (1921) 1968,. *Economy and Society*. Translated by Roth G. and Wittich C Totowa, N. J.: Bedminster.