Risk Estimation in Rural Social Networks

The BSE Case: Opinion Making in a Community in Northern Germany

Markus Lehmkuhl
Department of Communication
Free University Berlin

Paper Presented to the

7th International Conference on Public Communication of Science & Technology

Cape Town 4-7 December, 2002

Abstract

*This survey in an examplary way explores the reception of the first case of
BSE in Germany. It tries to give proof of the great impact size and
structure of communication groups have on the risk evaluation process and its
results. The communication groups were evaluated in the framework of a network
study carried out in a northern-german village with 820 inhabitants. Apart from
the size of communication groups, the participation of farmers in the communication
networks turned out to be of crucial importance for people's knowledge and attitudes
on the BSE subject. The survey's result supports the theory of a "two-step flow of
information". Those who have only seldom
discussed BSE with others, know less about the disease than more active
communicators. From this one can derive the thesis, that conversation plays
a crucial part in bringing mass media information to the recipient. This is
particularly true for less educated segments of society.*

Introduction

When the first case of BSE occured on a German-born cow, the country's
agricultural sector was thrown into a devastating crisis that by some media was
compared to what followed Chernobyl in the nuclear energy sector. A whole
country of consumers all of a sudden seemed to realize a threat that simply hadn't
existed in people's thoughts before. Until November 2000, politicians had
repeatedly stressed – and the public had believed - that there would be no BSE in
Germany, as long as one refrained from eating beef, especially beef imported from
Great Britain. Only shortly afterwards the mass media reported the first case of
BSE in Germany, and every citizen felt highly at risk. Most Germans reacted with a
form of escapism: They abstained from eating beef – and the markets collapsed. In
the wake of finding scapegoats who could be made responsible for the desaster two
Federal Ministers were removed from office. However, confidence in the state's
regulating and controlling ability was shaken, maybe even sustained lasting
damage.

The chain of events commonly referred to as the „BSE crisis" can be considered a
historical opportunity for communication scientists to closely examine how risk
evaluation takes place in social networks. When the first infected cow appeared on
the frontpages of the daily newspapers it created in the population the urge to
communicate. People found themselves facing a risk hard to estimate. Like many of
the threats a highly-industrialised society finds itself exposed to nowadays (Beck
1986), the risk of an BSE infection cannot be experienced in a sensual way. One
cannot smell, feel or taste the threat. Like many other dangers of modern life BSE
becomes „felt" just because the media report on it. Thus, risk evaluations and the
following decisions cannot be double-checked or validated by personal experience.
Decisions are made in an experience-free space, based on certain information or
emotions. From the appearance of the first infected cow on the frontpages resulted
an immense pressure to make decisions, virtually every citizen had to deal with the
topic. People had to either try to keep the threat at bay by changing their
consumption habits, or they had to get their fear under control by categorically
ignoring the threat (to a summary of the socio-psychological results cf. Bierhoff

2002). Therefore BSE is an apt topic to take a closer look on the relation between interpersonal (risk) communication and mass communication.

Since the Columbia studies (Lazarsfeld, Berelson, Gaudet, 1944; Merton 1957; Berelson, Lazarsfeld, McPhee 1954, Katz, Lazarsfeld 1955; Coleman, Katz, Menzel 1966) classical research on media impact has been characterised by the dualism of interpersonal communication on the one hand and the mass media on the other. Interpersonal communication, i. e. a conversation between partners, friends, acquaintances or colleagues, has been considered a limiting factor to the impact of mass media. Klapper (1960) describes and summarises this dualism in detail: He treats the influence of interpersonal communication as an intervening variable. Omitting this variable would result in a more direct impact of the media. Other authors (Robinson 1976; Beinstein 1977) support this thesis. More recent results on this topic often draw on network studies and come up with the metaphor of the protective shield (Schenk 1987: 278; Schenk 1995: 64): Small groups and interpersonal relationships screen the recipient from media influence. The hypothesis: The more isolated, the more detached a person is from a relationship network, the more exposed he/she is to media influence. „With the transition from stable primary group relations to loose and less dense networks (..) the power absorbing media influences would be weakened; the (..) impact of small groups would have been overestimated. The media would, after all, rule the agenda of the public and influence political opinion making." (Schenk 1995: 65).

This leads us to the approach of the study presented here. The aim was to further examine the relation between the mass media and interpersonal communication. Taking a rural community in Northern Germany as an example, the author firstly analyses the interpersonal environment which the recipients of a risk message find themselves in. Until today, results on the interpersonal environment that exist for Germany are sometimes contradictory and need to be further clarified (cf. e.g. Schenk 1995; Petermann 2002). Additionally, it has not been made clear so far if and to what extent personal networks in Germany differ from those in other western countries, especially in the U.S. (Cf. e.g. Fischer 1977; 1982 or Burt 1984; 1985), as the results of Schenk (1995) suggest.

This study also analyses the forms of communication that media messages like the first case of BSE provoke in a certain environment. Sociopsychological studies dealing with conformity effects lead to the assumption that in the U.S. group influence has been diminishing since the Fifties. (For a summary see: Stroebe 2002; 459). Hence, the author shall try to find evidence to help clarifying whether the influence of the media grows automatically with the diminishing integration in primary group relations. Up to now it has not been proven if media impact grows with conformity pressure decreasing.

In summary, one can say the basic idea of this explorative survey consists in reconstructing the individual risk evaluation process in the case of BSE in a given social environment. Additionally, it shall present evidence highlighting the impact of interpersonal conversation in this process.

Description of Methods

Since the survey focuses on analysing the function of conversation and social environment, the possibility of questioning a representative group of individuals was ruled out in the beginning, mainly due to practical reasons. Conducting a representative poll would have implied the use of the snowball system, which was

impossible in the framework of this survey. Also, gathering the opinions of the persons questioned wouldn't have been possible within a short period of time. Hence we chose the village of Colnrade, situated 50 km southwest of Bremen, to conduct a fullscale survey. The village has 820 inhabitants, among them 632 above age 16. In the five weeks from 01-03-2001 to 07-04-2001 the villagers were questioned by me and two assistants. At that time, the subject BSE had disappeared from the headlines since two weeks ago. We wanted to make sure that attitudes were no longer subject to a formation process still in progress. Compared to German standards the place can be called remote. The neighbouring small towns having approx. 10,000 inhabitants are 12 to 15 km away.

404 villagers were questioned, this equals a participation quota of 69.3%. 49 persons were excluded in advance, either because they were absent during the survey period or because illness kept them from participating. Among the 404 persons questioned 333 (82,4 Prozent) were willing to mention their contacts by name. Considering the sensitivity of the data this quota can be regarded as a success. The gathered data enabled us to get a detailed picture of the groups entertaining regular contacts in the village.

The socio-demographic comparison of the villagers with the average of Lower Saxony brought out only one difference worth mentioning: Whereas only 20.4% of the villagers have a higher educational degree, the average of Lower Saxony is 28.8%.

Central Variables of the Survey
Media Use:
Every villager was questioned in detail on his/her use of media. As a result we got self estimations of their daily amount of watching, listening and reading. The average villager watches two and a half hours of television per day, listens to the radio for approx. four hours, and spends 34 minutes to read the daily paper. These estimates differ only slightly from those regularly collected for the whole of Germany.

Science magazines that can be bought or received countrywide are of virtually no importance to the villagers. Merely one TV science show – a daily broadcast called „Galileo" – is regularly watched by 19.6% of the village population. Quarx & Co comes second. This monthly, monothematic science show reaches far less of the villagers: 3.5% watch the broadcast on a regular basis. The print magazines with the highest circulation nationwide (Spektrum der Wissenschaft, Bild der Wissenschaft, PM) are read by 13 villagers (3.2%) only. More than 90% of those questioned didn't even know the periodicals. Newspaper use is dominated by regionally published subscription newspapers. 86 percent of the villagers read one of the four regional newspapers at least once per week. Quality newspapers published nationwide are of no importance. Merely six villagers (1.5%) stated they read one of the five national papers regularly. Only the nationwide tabloid „Bild" is frequently read by 14.6% of the villagers.

Weekly national papers and magazines (Spiegel, Stern, Die Zeit, Die Woche, Focus) are read frequently by 13% of the villagers. Tabloids published on a weekly basis (Welt am Sonntag, Bild am Sonntag) are read by 15%.

90% of the villagers regularly watch one daily news broadcast on TV. 154 inhabitants (38%) even watch two different news shows several times a week. An important source of information are weekly politicial magazine programmes

(Panorama, Monitor, Report). They reach an average of 25% of the persons questioned.

Summarizing one can say that with the exception of one, the science magazine programmes do not reach an amount of users worth mentioning. The national quality press published weekly also is of minor importance for the persons questioned. On the other hand, the regional press and the daily news programmes are of crucial importance, as well as the weekly political magazines on TV. Radio broadcasts also play an important part: 78% of the villagers listens to the radio news several times a day. Then again, stations focusing on information and the spoken word are of virtually no importance. Only five villagers (1.2%) tunes in on one of the three informational stations (Deutschlandfunk, DeutschlandRadio Berlin und NDR 4 Info) at home. On the road seven of the persons questioned (1.7%) listen to these stations.

Attitudes and knowledge

In sociopsychological research an attitude is defined as a mental tendency, „expressing itself in a certain degree of sympathy or dislike with which one judges upon a particular object" (Stroebe 2002: 267). Altogether, sociopsychology has defined three components of attitudes:

1. Cognitions, namely opinions on the object
2. Affects, namely feelings and emotions connected to the object
3. Behaviour, namely actions or intentions to act in connection with the object

In this survey, the attitudes towards the chain of events in the case of BSE have been derived from the attitudes expressed in the answers to twelve statements. Refering to a five-scale-ranking the person questioned could state to what extent he/she personally agrees with a statement. In a second step, he/she could give an estimation on the opinion of the majority of the population on the statement given. One could also refuse a clear ranking by marking „No Opinion". The statements given were:

A The farmers have to blame themselves for their misery. I'm fed up with their complaints.	G The topic BSE has been blown up by the media.
B On the subject of BSE only the statements of scientists are trustworthy.	H If one case of BSE occurs in a herd of cattle, the whole herd has to be killed..
C Controls have to become tighter in the case of BSE, only then will one get the problem under control.	I BSE is threat that has to be taken seriously, the media have to warn the population most urgently.
D On the subject of BSE one cannot trust the politicians, no matter which party they belong to.	K There are only few cases of BSE. Therefore I consider it an exaggeration to stop eating beef at all.
E It is an indispensible measure that the government uses tax money to buy cattle the farmers can't possibly sell at the moment. It has to be done for the sake of the agricultural sector.	L One has to appreciate the fact that the government is doing everything to get the problem of BSE under control.
F The Federal Government has underestimated the hazards of BSE.	M The Case BSE makes mainly one clear: The agricultural system has to be changed completely.

Questions on the consumption habits tried to evaluate the behavioural impact of attitudes.

Another central variable of the survey was to find out more about the knowledge of the villagers on the topic BSE. This was done with a set of questions consisting of two open and eleven questions with several answering alternatives. The questions can be divided into three fields of knowledge:

a) The scientific core of the problem without any reference to information relevant to the decision-making process. Two questions are aimed at the knowledge of the pathogen, one at the way the disease is passed on, and one at the scientific term for the disease.

b) Non-scientific knowledge without any reference to information relevant to the decision-making process. We wanted to find out to what extent people were interested in political measures to ensure protection from BSE.

c) Information particularly relevant to decisions in consumption. The seven questions in this set were meant to highlight the rational basis underlying risk decisions. Questions on the number of BSE cases being known in Germany, France, and Great Britain at the time were of major importance.

Network Variables

The lack of a unified practice of data collection hampers the research of ego-centered networks. The number of name generators used depends on the objectives of the particular set of questions. A standardised way of operating is far from being achieved (Pfennig 1994). Thus, it is difficult or even impossible to compare the results. In order to cope with the individual demands of the poll and at the same time reach a certain comparability, this survey is oriented towards the four network generators, applied in a representative survey conducted by Schenk (Schenk 1995:96f). (Schenk again refers to studies of Burt 1984/1985, and Fischer 1982). The generators aim at the dimensions of personal familiarity, conversations on BSE, social gathering, and – in allusion to the concept of opinion leadership – the phenomenon of the „informed acquaintance".

Question/Name Generator	Dimension	Network Specifics
1. Thinking back to the past three months: With whom did you talk about things that mattered to you personally?	Familiarity	strong relationships; core network
2 Then and again people talk to others about random subjects. How about BSE? To whom did you talk about this subject?	Interpersonal risk communication and opinion making	| | | | |uni-/multiplexity of relationships|
3. People get together for various activities like doing sport, being sociable, having a drink etc. How about you? Who did you socialise with recently?	Social acitivities	| | | |
4 Some people always seem to know what's going on in the world? How about your friends and acquaintances? Who is best-informed?	Sources of personal influence	Access to „experts" in circle of acquaintances

At each question people were asked to write down the names of their personal contacts on an index card. 15 contacts maximum were allowed. Then we asked for information on the persons mentioned (age, educational degree, frequency of contacts, duration of acquaintance, intensity of relationship, place of residence). Additional information was asked on the communication partners on the BSE subject (level of information (higher/lower/equal), communication participation (partner was more active or not), profession: farmer (yes/no)). Apart from that we gathered information on network density (Did all the persons mentioned know each other?) and multiplexity. The multiplexity is derived from the four network generators. Basically, each existing relation touches upon four network generators – such a grouping is defined as total multiplexity. A relation is totally multiplex if the person questioned has talked about personal matters, about BSE with a contact mentioned, when he/she has spent spare time (common activities) with him/her, and considers him/her an informed acquaintance. In this survey, multiplexity is determined as a proportional value according to the total of existing relations (Number of multiplex relations/maximum possible number of relations * 100).

Risk Communication in Ego-centered Networks

Structural Aspects of Interpersonal Risk Communication
Considering the great stir caused by the first case of BSE in Germany it doesn't seem surprising that nearly everyone who entertains contacts to others talked about the subject. Among 404 persons questioned, 389 stated to have discussed the topic with at least one partner. On average, the persons questioned talked to five different persons. This equals 66.9% of all persons in the network. The greater the network, the more the share of conversation partners on BSE decreases (p=,-28**). That means that interpersonal communication happened primarily in the core area of the networks. Nevertheless, those with a large circle of acquaintances discussed the BSE subject more often than others did. The relation of network size and number of conversation partners is highly significant (p=,69**).
More talks about the issue had the better educated villagers (p=,22**). The age is also of importance: Older villagers have discussed more rarely the issue than others did (p=-,11**). That is mainly due to the fact that older and less educated villagers has smaller contact groups. Therefore the opportunity for having a talk is more limited.
An important variable for assessing the structure of interpersonal communications is the geographical proximity. In the presence of a highly developed technical infrastructure – each villager has telephone, 65 percent have in addition a cell phone, around 30 percent have access to the WWW, virtually each villager owns a car – human relations are principally no longer limited by geographical constraints. Nevertheless the findings indicate that geographical proximity remains obviously a key factor for the maintenance of human relations even in an highly industrialised society.
If one consider the networks as a whole, it appears that close-range contacts are prevailing. On average 59 percent of the network partners, which origins have been identified, live in the village itself. Only 5 percent of the network partners are located more than 50 kilometers away. Those located more than 100 kilometers away are usually relatives doing their studies.

Figure: Origin of contact persons
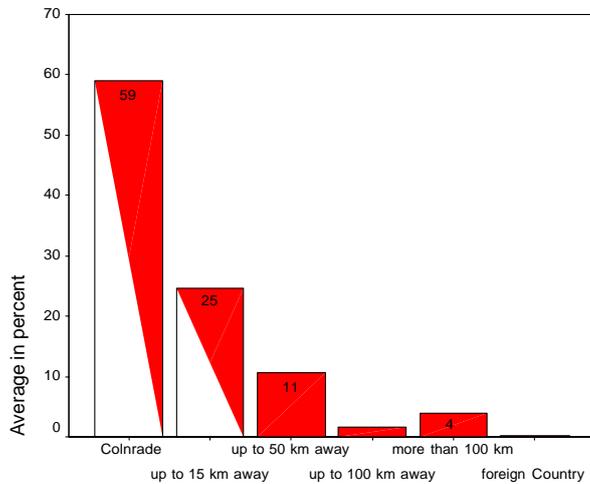
The strong focus on close-range contacts is also reflected by the composition of the communication groups. In 54 percent of the communication groups partners living in the village itself or in the surroundings are predominant.

Figure: Share of village inhabitants in communication groups
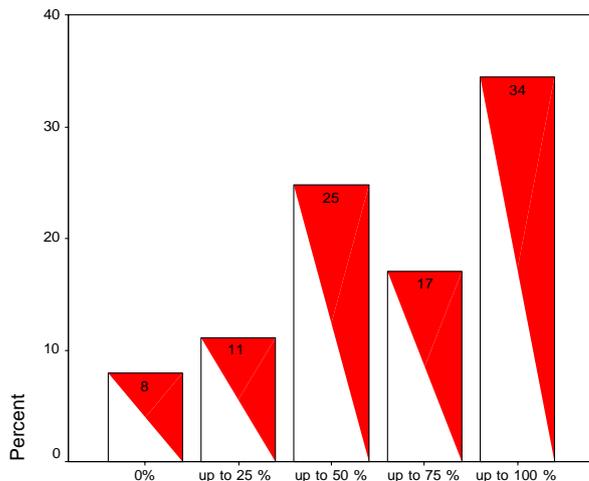
The share of communication partners from the direct neighbourhood is particularly high for the elderly (p=,28**), for the formally less educated (p=-,26**) and for persons with a high share of farmers in the communication groups. Moreover there is evidence, that the quantity of neighbourhood-contacts is particularly high in smaller communication groups (p,-21**). Correspondingly their networks show a particular density (p=,46**) and are characterised by mostly strong relationships (p=,26**).

Summing up, the structure of interpersonal risk communication on the subject of BSE can be described as follows: Those with a generally high level of social contacts had intense discussions on the subject within their existing social

networks. In circles with strong links to agriculture, there has been a particularly intense discussion on the subject. These findings are largely consistent with research on political communication. Interpersonal communication on policy issues happens primarily in the core area of the networks (Schenk 1995: 152). The same applies to interpersonal communication on the risk subject of BSE. The influence of those living in a distance on the process of interpretation is negligible. Particularly strong is the orientation towards the direct neighbourhood for formally less qualified elderly people with small communication groups.

Opinion leadership

Since it had been „discovered" in the Columbia-studies, the concept of the opinion leader has produced inconsistent research findings. On the one hand, the opinion leader is considered as someone who can be found evenly distributed in all social strata and who moves in an homogeneous social environment. On the other hand, it has been found that in the field of politics opinion leaders belong to the upper class. In the past a typical feature of opinion leaders was the increased use of media. They were identified as well-integrated people with networks characterised by strong and multiplex relations (Weimann 1982). Other Studies challenged this findings (Danowski 1984). These differences are obviously caused by the fact, that opinion leadership can probably be best described as a passing characteristic, which can be more or less pronounced depending on the subject. As far as I am aware, findings on opinion leaders in debates on risk subjects are lacking. In the present study, this concept has been made operational by focussing on the communicative behaviour of the interviewee: Did he/she play a more active or a more passive role in the conversation on BSE with partner x, compared with the proportion of speech? The interviewee was asked to assess his/her degree of activity on the basis of a graduated scale with five conditions. The resulting communicative roles were the opinion leader (scaling parameters 1 and 2), the exchanger (scaling parameter 3) and the receiver (scaling parameters 4 and 5).

Table: Role contexts of interpersonal risk communication

	Opinion leader		**Exchanger**		**Receiver**	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
none	214	55,0	95	24,3	206	52,8
up to 25 percent	43	11,0	25	6,4	80	20,6
up to 50 percent	61	15,6	73	18,8	52	13,3
up to 75 percent	30	7,8	64	16,5	12	3,2
up to 99 percent	5	1,4	30	7,8	2	,5
All	36	9,2	102	26,1	37	9,6
Total	389	100,0	389	100,0	389	100,0

71 villagers can be considered as real opinion leaders: They acted as opinion leaders in over 50 percent of the conversations they had. 84 villagers acted as opinion leaders in at least one conversation they had on the subject of BSE. For the majority of the villagers opinion leadership is of no concern. A similar pattern can be identified for the role of exchanger. 51 villagers must be seen as real opinion receivers; this role is prevalent in their communication networks. Only about half of the villagers declare, that they never played the role of receivers during a conversation. The dominating role is that of the exchanger. Nevertheless these

findings reflect processes of social influence and in this context the question arises, who exercised an influence and who was influenced.

Table: Bivariate analysis of communicative roles

	Opinion leader	Exchanger	Receiver
Structure of networks			
Size	,19**	,12*	,-20**
Density	-,18**	n.s.	,15**
Heterogeneity of age	n.s.	n.s.	n.s.
Heterogeneity of education	n.s.	n.s.	n.s.
Share of people from Colnrade in the network	-,10*.	-,11*	,10*
Structure of communication group			
Size of communication group	,16**	,16**	-,24**
Share of people from Colnrade	n.s.	n.s.	,14**
Number of farmers	,16**	n.s.	n.s.
Share of farmers	n.s.	-,10*	n.s.
Relations			
Intensity of relations	-,11*	n.s.	,15**
Multiplexity	n.s.	n.s.	n.s.
Sociodemographic aspects			
Age	,-19**	n.s.	,24**
Education	,22**	n.s.	-,23**
Gender	n.s.	n.s.	n.s.
Professional status	,11*	n.s.	-,10*
Level of knowledge and attitude			
Level of knowledge	,10*	,11*	-,21**
Changes in consumer behaviour	n.s.	n.s.	n.s.
Firm opinion	,25**	n.s.	-,28**
Use of media			
TV	-,11*	n.s.	n.s.
Radio	n.s.	n.s.	n.s.
Newspapers	n.s.	n.s.	n.s.

Opinion leaders and exchangers are the stronger communicators. This is supported by corresponding correlation regarding the overall size of networks and the size of communication groups. The quantity of opinion leadership relations as well as that of exchange relations increases with the quantity of contacts and the quantity of communication partners. Particularly high is the proportion of opinion receiver relations in small-scale networks and small communication groups.

The networks of opinion leaders are characterised by a lower density. This means that the networks of opinion leaders comprise more people who do not know each other, a fact that indicates a larger range of this networks. This is supported by the finding, that the share of contact persons living in the village itself is slightly below average. But the larger range is of virtually no importance to the process of interpretation, because the share of villagers in the communication groups of opinion leaders is on average, contrary to the opinion receivers, which are very often pronounced locals. Depending on the differences in network size and size of

communication groups, the networks of opinion leaders are characterised by a slightly higher share of weak relations.

Remarkably, differences in the degree of involvement have an influence on the share of opinion leadership relations in the communication groups. The role of opinion leader is particularly often played by those whose communication groups comprise a larger amount of farmers. This correlation don't exist for the share of farmers in communication groups and this may indicate that the influence of opinion leaders closely linked to agriculture was not limited to people affected in the same way. It seems that the particularly affected have likewise particularly influenced the process of interpretation in the village community.

When comparing opinion leaders and opinion receivers under sociodemographic aspects, one can find consistent relations regarding age, educational attainment and – less pronounced –professional status. Younger, formal better educated people and employees have taken on the role of opinion leader more frequently and vice versa. So there are clear trends suggesting vertical influence in interpersonal risk estimation.

In this study there is no evidence that opinion leaders made more extensive use of the media than others. There is a slightly negative correlation between the time spent to watch tv and the share of opinion leadership relations, probably due above all to the differences in the size of contact groups. More active communicators have less time to watch tv.

Just slightly positive but nevertheless significant is the correlation between the level of knowledge and the share of opinion leader and exchanger relations in the communication groups. Clearly negativ is this correlation for the opinion receivers. It seems that for taking on the opinion leadership factual competence is of minor importance. A far stronger influence on the share of opinion leader relations has the conviction of the interviewees to have a firm opinion. As expected opinion leaders have a firm point of view. However, this point of view is not clearly attributable to a more intense examination of the subject. This becomes evident in comparison with the also well informed exchangers. For the receivers the picture is more consistent. They have examined the subject less intense and often have no firm opinion on the subject.

Summarising and simplifying the typical opinion leader in the interpersonal process of interpretation on the subject of BSE can be described as a woman or a man who maintains an above-average amount of contacts - i.e. more than eight – and who is in contact with farmers and therefore more affected by the subject. She/he is younger than the average interviewee, i.e. under 45, and has at least completed lower secondary school. Her/his contacts comprise people not known to his other network partners. The share of her/his contact persons living in the village itself is slightly below the average of 54 percent, she/he is obviously not particularly oriented towards relations in the village. At best her/his level of knowledge is slightly above average but she/he has a firm opinion on the subject.

Interpersonal Risk Communication and Knowledge
The level of knowledge was calculated with the help of a simple index. Who had answered 80 or 92 % of the 13 questions correctly, was rated „well" or „very well" informed. Those who answered 60 or 50% in a correct way, were rated „average"

or „below average". If less than 50% of the answers were right, the person questioned got an „unsatisfactory". The following table reflects the level of knowledge among the villagers:

Table: Level of knowledge

		Frequency	percent
Valid	very good	5	1,3
	good	38	9,5
	Average	171	42,8
	below average	73	18,3
	Unsatisfactory	113	28,3
	total	400	100,0
Missing		4	
Total		404	

The relatively small number of the well and very well informed is mostly due to the mostly incorrect answers on questions on the scientific core of the BSE problem, that is, questions on the pathogen and on the class of substances the pathogen belongs to (proteins). In many cases the questions on the number of BSE cases in Germany, France, and Great Britain were not answered correctly. 16.9% could answer the questions on the pathogen; only 7.7% were able to give an estimation on the number of BSE cases, a figure which could be chosen from a given table. A large majority clearly underestimated the number of BSE cases especially in Great Britain, where at the time of the survey more than 150.000 pieces of cattle were infected. Quite obviously, the probability of coming into contact with BSE-infected meat didn't have much impact on the estimation of personal risk for most of the persons asked. However, this result is slightly toned down by the fact that one third of the persons questioned at least know the number of BSE infections in Germany.

When analysing the relation between interpersonal risk communication and knowledge it is first of all important to examine the connection between communication intensity, the number of conversation partners and their respective knowledge levels. The relation is a positive one (p=,20**), i. e. the parts of the population that communicate more actively have a higher knowledge level than others. Network studies of this sort mostly reach the conclusion that there is a relation of the number of communication partners with the educational level. The relation becomes also visible in this survey. Persons with a higher level of education are usually part of larger conversation groups (p=22**). Formal education also influences the knowledge level (p=,22**). However, to avoid the result on the relation of knowledge level and size of communication group being watered down by the impact of formal education, the correlation have been calculated for each different education level. As a result, the relation is indeed weakened, but the number of conversation partners still influences the difference in knowledge (junior secondary level N=207 : p=,14*; intermediate level N=134: p=,21*, senior high school/university level N=57: p=,08 n.s.). Within the group of the higher educated the relation can at a certain level hardly serve to explain the difference in knowledge. This is maybe due to the fact that the relation weakens with the number of conversation partners growing. To put it differently: For a difference in knowledge it is more important whether a person talked to 5 partners or to no one at all (N=266; p=,14*) than it is to have talked to 6 instead of 15 partners (N=132; p=,06 n.s.). Apart from that, it seems likely that for the formally

lesser educated it is more important to talk to others in order to gain knowledge than it might be for someone well-educated.

The proportion of farmers within the networks might serve as another explanation for the varying knowledge levels: The level of information increases with the proportion of farmers growing (p=,23**). This result remains basically unaltered even if one excludes farmers with networks mainly consisting of colleagues from the sample. The relation is weakened but still remains significant (p=,18**). Eliminating the variable of formal education also shows that the better the educational degree, the more the relation is weakened. The proportion of farmers in the group of the less well-educated unfolds a particularly striking explanatory meaning in this context (N=207, p=,26**).

Supposing that the knowledge of the persons questioned is a result of mass media information efforts (whether transmitted directly or indirectly is of no importance in this context) and also considering the fact that differences in the use of media cannot possibly serve as an explanation for the different knowledge levels, the relation between informative media influence and interpersonal risk communication presents itself as follows: Talking to others does not reduce but increase the influence of the media. The disintegration of social environments – should it really take place – brings forth a growing isolation of the individual. This might eventually lead to mass media messages no longer reaching the recipient, especially if the latter stem from a lower educational level. For them, talking to others in order to gather knowledge relevant for risk decisions seems even more important. Thus, the results in this survey lead to assume the existence of a two-step flow of *information*, whose structure was to be explained by a detailed analysis of the communication partners.

Interpersonal Risk Communication and Attitudes
The attitudes of the persons questioned can best be analysed by asking whether they changed their consumption habits during the BSE crisis. At first sight, it might come as a surprise that only a minority (43.8%) gives an affirmative answer to this question. This is surprising because according to statistics, the consumption of beef in the federal state of Lower Saxony (unfortunately, there are no data for smaller regions in the state) decreased by approx. 80% - at least when looking at the amounts of meat sold here. This inconsistency is partly explained by the fact that it was more women who stated having changed their consumption habits (p=,13*). Since it is still quite common that women do the shopping it might be possible that some of the men questioned changed their consumption habits without having made a conscious decision about it. In addition, many of the persons questioned stated that they still have a large stock of beef at home, so they hadn't yet bothered about future purchasing decisions. What reduces the inconsistency even further is the fact that the village population questioned in this sample certainly has a closer relation to agriculture than the average Lower-Saxonian. The sample presented here gives proof of the fact that the proximity to agriculture also given by the large number of farmers in the communication groups did in fact have an impact on consumption decisions (p=,14**). The relation of the proportion of farmers and the consumption decisions proved to be non-significant. It is therefore not relevant in this context if farmers make up larger parts of the communication groups.

The communication activity of the persons questioned doesn't serve as a sufficient explanation for the varying attitudes. But, the relation between a change in

consumption habits and the size of a communication group proves to be significant (p=,11*). Active parts of the population more often decide in favour of a change in consumption habits. Even more important in explaining the difference in attitudes are the structural characteristics of communication groups, f. i. the share of farmers within the respective networks.

Table 3 : Bivariate Analysis of attitudes and share of farmers in communication groups

	Share of farmers
A The farmers have to blame themselves for their misery. I'm fed up with their complaints.	**,19****
B ....only the statements of scientists are trustworthy.	**n.s.**
C ...Controls have to become tighter... .	**n.s.**
D ...one cannot trust the politicians, no matter which party	**n.s.**
E .. uses tax money .. has to be done for the sake of the agricultural sector.	**-,19****
F The Federal Government has underestimated the hazards of BSE.	**n.s.**
G The topic BSE has been blown up by the media.	**-,22***
H If one case of BSE occurs in a herd of cattle, the whole herd has to be killed..	**n.s.**
I BSE is threat that has to be taken seriously, the media have to warn the population most urgently.	**,15****
K There are only few cases of BSE. Therefore I consider it an exaggeration to stop eating beef at all.	**-,16****
L One has to appreciate the fact that the government is doing everything to get the problem of BSE under control.	**n.s**
M ...agricultural system has to be changed completely	**,21****
Changing comsumption habits (1 yes/2 no)	**n.s.**

The process of interpretation unfolding itself in the communication groups with the first case of BSE is strongly influenced by the contacts to local experts. This also may explain the varying attitudes developing. There is no comparable relation to be found in the context of different patterns of media use. Thus, this explorative study supports the hypothesis that the forming of opinions and attitudes on the risk subject of BSE is first of all influenced by the exchange within communicational groups. Nevertheless, the thesis of the group serving as a protective shield against the influence of the media cannot be fully affirmed by the results of this survey.

Again, the survey may serve as a weak evidence for the assumption that communication itself plays a key role when it comes to forming an opinion at all. In our questionnaire the option „No opinion" was offered for the questions demanding the expression of a personal view. 32.7% of the 404 persons asked didn't have an opinion about at least one of the 12 statements. The number of cases in which a person questioned didn't have an opinion have some relation to the size of his/her communication group (p=,-16**) and to the formal level of education (p=-,15**). Excluding higher education shows a relation in the cases of persons with lower and intermediate education levels (p=,-19** bzw. p=-0,8 n.s.). The size of the communication group doesn't serve as a sufficient explanation for the group of the formally better educated. For further explanation we refer to our remarks on the knowledge levels. In the process of forming an opinion talking to others doesn't

seem as important for the well-educated as is for those from a lower educational level. These pieces of evidence support the assumption that solid opinions cannot be formed by media consumption alone. To what extent group influence serves as an intervening variable for media effects does indeed require further examination.

Bibliography
Ulrich Beck: Risikogesellschaft. Auf dem Weg in eine andere Moderne, Frankfurt am Main (Suhrkamp) 1986.
Beinstein, J.: Friends, the Media, and Opinion Formation. In: Journal of Communication, Vol. 27. Jg. (1977), S. 30-39.
Berelson, B.; Lazarsfeld, P; McPhee, W: Voting, Chicago 1954.
Hans Werner Bierhoff: Einführung in die Sozialpsychologie. Weinheim (Beltz) 2002.
Burt, R.S.: Network Items in the General Social Survey. In: Social Networks, Vol. 6. Jg. (1984), S. 293-339.
Burt, R.S.: General Social Survey Network Items. In: Connections, Vol.8. Jg. (1985), S. 119-123.
Coleman, J.; Katz, E.; Menzel, H.: The Diffusion of an Innovation Among Physicians. In: Sociometry, Vol. 20. Jg. (1957), S. 253-270.
Danowski, J.A.: Personal Network Integration: Infographic, Psychographic and Demographic Characteristics. Paper presented to the Information Systems Division of the International Communication Association, San Francisco 1984.
Fischer, C.S. et al: Networks and Places Social Relations in the Urban Setting. New York 1977.
Fischer, C.S.: To Dwell Among Friends Personal Networks in Town and City. Chicago 1982.
Katz, E; Lazarsfeld, P.: Personal Influence. The Part played by People in the Flow of Mass Communication. New York 1955.
Klapper, J.T.: The Effects of Mass Communication. New York, Glencoe 1960.
Lazarsfeld, P.; Berelson, B; Gaudet, H.: The people's choice. How the Voter Makes Up His Mind in a Presidential Campaign. New York 1944.
Merton, R.K.: Patterns of Influence: Local and Cosmopolitan Influentials. In: Merton, R.K: Social Theory and Social Structure. New York 1957. S. 387-420.
Petermann, Sören: Persönliche Netzwerke in Stadt und Land. Siedlungsstrukturen und soziale Unterstützungsnetzwerke im Raum Halle/Saale. Opladen (Westdeutscher Verlag) 2002.
Robinson, J. P.: Interpersonal Influence in Election Campaigns: Two Step Flow Hypothesis. In: Public Opinion Quarterly, Vol. 40. Jg. (1976/77), S. 304-319.
Schenk, Michael: Soziale Netzwerke und Massenmedien Untersuchungen zum Einfluß der persönlichen Kommunikation. Tübingen 1995.
Stroebe, Wolfgang (Ed.): Sozialpsychologie. Eine Einführung. Berlin (Springer) 2002.
Weimann, G.: On the Importance of Marginality. One More Step into the Two-Step-Flow of Communication. In: American Sociological Review. Vol 47 (1982), S.764-773.