



SOCIAL ASPECTS

THE USE of whispering has been characterised as being wide-spread across cultures, but rare in a given society. It was already high-lighted as a major aim of my study to elucidate factors which possibly could explain this seeming discrepancy. Until now, only a few investigators have treated this issue, and most of them have simply postulated a cultural taboo as the dominant cause of a restricted application of whispered speech (Miller 1934; Panconcelli-Calzia 1955). Although such taboos will certainly play a role in this respect, the explanation may be too hypocritical. Instead, a multifactorial interpretation should be more appropriate. This rational is supported by the following three arguments:

First, one should not overlook the wide distribution of the display (Jensen 1958). Thus, it can well be thinkable that there are different reasons why people decide to use or not to use a whispering voice. Second, in the field of communication, a rare occurrence of a specific signal is often correlated to a high relevance, and there is evidence that such occurrence can sustain a signal's salience (Todt 1986). Last but not least, the hypothesized statement has heuristic advances; that is, it expands the perspective and stimulates a search for several different relevant factors.

With these arguments as a reference and a framework as well, my study was designed to investigate the use of whispered speech from a social perspective. In the past, social aspects of whispered speech have been widely neglected. Hence, there is a massive deficit of profound knowledge about basic objectives, such as the true occurrence rate of

whispering or reliable data on 'when' and 'why' it is used. In addition, there is a need of authentic information on how it is judged by people who just witness its application in a public audience, e.g. as a kind of 'co-listener'.

Given this situation, I have conducted two lines of research. At first, I performed a general inquiry which, in particular, aimed on surveying the spectrum of individual motives and experience related to a social use of whispering (*see section 3.1.*). Then, I conducted a set of experiments which were designed to clarify variables that seemed to be related to this social role, and thus could effect the judgement of whispering.

3.1 General Inquiry

Methods

Data were collected by students who beforehand had been trained to apply questionnaires and, if necessary, to combine them with interviews. To avoid systematically effects that can arise from such kind of data sampling, we applied five types of questionnaires that corresponded only in particular core-questions, but differed in the succession of such questions and also in a number of side-questions. This procedure allowed us to later compare the results and, since data were distributed symmetrically across samples (n= 5 times 70 people), also to calculate basic statistical values.

When filling-in our questionnaires, subjects (n = 350, in total) could give their votes either by choosing among alternative items, or - if more than one vote was allowed - by indicating their first, or second, or third priority. Additionally, subjects were asked to give us some private information, e.g. their age and their cultural origin. Thus, the evaluation of answers and choices was not difficult, at all, and allowed to test for a number of correlations. Such correlations were calculated, however, only within subsets of comparable data.

Results

The results were subdivided into the following three subsets: data providing general information, data concerning aspects of whispering in the private domain, and data concerning aspects of whispering in the public.

Table 3.1 : Distribution of votes collected during a general inquiry (sample size: 350 people). Data are given in percentages (M=mean; SD=standard deviation). The sample includes 76 % natives, here: Germans. The column 'non-natives' incorporates all other people. Choices refer to alternative questions (see text). Top: How do you think about whispering? Middle: How often do you whisper yourself? Bottom: How do you respond if somebody addresses you by whispering?

general attitude	distribution (%)													
choices	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
positive	35.2	8.7	36.2	6.9	43.9	11.2	46.0	7.1	50.2	6.6	48.5	8.4	43.1	5.9
negative	12.1	4.2	11.4	4.3	7.3	3.4	16.0	3.7	12.4	4.2	15.5	3.2	10.3	3.6
situation depended	38.5	7.3	40.2	9.3	48.7	7.3	24.3	8.0	35.5	7.4	33.3	7.8	41.4	8.4
rest	14.3	4.6	12.2	2.5	0.0	0.0	13.7	3.6	1.9	1.1	3.0	2.3	5.2	2.7

frequency	distribution (%)													
choices	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
often	13.8	3.2	12.3	4.1	23.1	5.4	6.25	5.4	21.4	4.9	16.1	3.8	12.5	4.3
seldom	59.8	5.8	61.9	6.3	48.7	6.3	68.75	7.1	49.9	6.2	51.6	7.0	64.3	6.4
from time to time	24.1	4.8	24.2	3.8	25.6	4.1	22.92	3.7	26.4	4.5	29.0	5.1	21.4	5.2
rest	2.3	2.0	1.6	1.0	2.6	1.5	2.08	1.3	2.3	1.7	3.2	2.3	1.8	0.9

responses	distribution (%)													
choices	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
whispering as well	52.4	5.6	55.8	6.8	61.9	7.0	40.9	5.2	64.2	4.3	66.7	5.7	46.7	3.9
situation depended	22.2	3.9	24.5	4.6	19.1	4.3	31.8	3.8	14.3	3.6	15.4	3.9	33.4	5.7
rest	25.4	4.7	19.7	5.2	23.8	3.7	27.3	2.9	21.5	8.7	17.9	4.3	20.0	5.1

General information

Above all, our data showed that the majority of subjects indicated a positive attitude towards whispering, and only a smaller portion announced negative feelings about it. Nevertheless, many people were more specific and stressed that their opinion would depend on the particular case or situation of whispering. If being asked how often they would whisper, most subjects declared to do it 'seldom' or 'from time to time', only (Table 3.1).

Table 3.2 : Distribution of votes collected during a general inquiry (sample size: 350 people). Data are given in percentages (M=mean; SD=standard deviation). The sample includes 76 % natives, here: Germans. The column 'non-natives' incorporates all other people. Choices refer to alternative questions concerning the private domain (see text). Top: Why do you use a whispering voice in your private sphere? Bottom: To whom do you address your private whispering?

motivation (private)	distribution (%)													
	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
tenderness	55.2	4.8	56.9	6.3	57.5	7.2	71.3	7.9	55.6	5.8	58.2	5.3	35.3	4.3
affiliation	12.6	3.7	13.7	4.9	12.1	3.4	9.7	3.2	11.1	3.7	11.9	3.6	11.8	2.7
playful	14.9	5.3	12.6	3.7	15.1	4.2	9.7	3.5	11.1	3.8	13.4	4.7	11.8	3.7
relaxing	11.5	3.1	10.2	2.2	10.6	2.8	9.7	3.1	11.1	2.7	11.9	3.4	5.9	2.3
rest	5.8	2.0	6.6	1.9	4.6	2.3	0.0	0.0	11.1	2.3	2.9	1.5	35.3	5.2

addressee (private)	distribution (%)													
	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
life mate	38.1	5.2	36.7	3.3	39.5	4.2	35.0	5.3	42.9	3.7	37.5	5.2	30.8	3.7
friend	11.1	4.7	13.8	4.1	8.7	2.6	17.7	4.7	11.1	2.7	11.1	3.7	7.1	1.6
family	10.2	3.5	13.4	2.7	7.7	3.1	9.4	3.2	10.3	3.3	11.0	4.1	9.9	2.1
children	12.2	4.2	14.2	3.0	14.9	5.0	7.8	1.9	8.7	1.8	13.3	3.9	12.5	1.9
rest	28.3	4.7	21.9	4.4	29.1	4.9	30.2	4.2	27.1	4.6	17.2	4.2	39.7	3.8

A specific set of data referred to an aspect of social facilitation and confirmed that whispering can have a strong 'contagious' effect. More than 50% of the subjects emphasized to clearly remember such 'catching effects' themselves, for example, when addressing somebody by friendly contact questions like 'hey, did you hear something, too?', or 'hey, what' s the matter with you?', or during playful situations, especially, when they were young.

Interestingly, our data did almost not differ with the cultural origin of subjects. This was found when the replies of subjects who declared to be German native speakers (here classed as 'natives') were compared to the replies of all remaining subjects. With respect to gender-related or age-class-related data distributions, on the other hand, some differences could occur. These differences did, however, not exhibit any systematically variation.

Private domain

A good portion of subjects (about 38 %) declared to use whispered speech in their private sphere, and many of them admitted to whisper quite frequently in this situation. Private whispering served to address special forms of tenderness or affiliation or invitations for playful interaction to the life mate or a partner, preferentially without other people around (Table 3.2). Such whispering could take place in close contact to an addressee, but also on the phone. In addition, several subjects declared to contact their partner by whispered words in the public, too, and they announced similar aims (e.g. 'signalling their bonding'), then.

Data did not show differences for the cultural origin of subjects. With respect to gender-related or age-class-related data distributions, on the other hand, some differences were found. These did, however, not exhibit any systematically effect (Table 3.2).

A more detailed evaluation of the data which we additionally had collected by interview methods documented that private whispering is particularly frequent during an early stage of 'courtship', and that its repeated use is obviously caused by a positive 'ingroup'-experience. Such experience seemed to not only reinforce a performance of whispering, but also to strengthen the bonding of mates.

Table 3.3 : Distribution of votes collected during a general inquiry (sample size: 350 people). Data are given in percentages (M=mean; SD=standard deviation). The sample includes 76 % natives, here: Germans. Choices refer to alternative questions concerning the public domain (see text). Top: Why do you use a whispering voice in the public? Middle: To whom do you address your public whispering? Bottom: What do you think or feel, if you are co-listening to the public whispering of other people?

motivation (public)	distribution (%)													
choices	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
not disturb	24.5	4.6	26.3	5.7	24.7	5.1	24.1	6.1	13.3	4.2	26.2	6.0	23.8	3.5
secrecy	23.5	5.1	21.9	4.8	24.7	2.4	20.7	5.2	26.7	5.1	24.6	5.7	19.1	4.7
attract affiliation	18.6	3.6	20.1	3.4	20.6	3.7	13.8	3.4	26.7	3.	19.7	4.6	14.3	3.6
playful	12.8	4.2	13.6	5.7	10.9	4.2	17.2	4.7	6.7	2.7	14.8	4.9	14.3	5.1
attention	10.9	4.0	9.2	4.2	9.6	2.8	13.8	2.3	20.0	4.6	8.2	3.2	14.3	3.7
rest	9.8	3.8	8.9	2.7	9.7	2.0	10.4	3.4	6.7	1.9	6.5	2.7	14.3	4.8

addressee (public)	distribution (%)													
choices	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
life mate	27.8	4.3	29.4	2.6	28.2	5.3	27.0	4.7	15.4	6.2	28.6	5.1	40.0	9.2
friend	48.2	7.3	46.7	5.7	50.7	8.2	43.3	6.2	53.8	8.3	48.6	6.4	35.0	7.3
family	9.3	3.1	11.6	2.8	7.0	2.7	13.5	3.9	15.4	3.4	7.1	2.7	15.0	4.6
children	8.3	2.7	7.9	2.1	9.9	3.1	5.4	2.4	15.4	4.1	7.4	3.2	5.0	2.5
rest	6.5	1.9	4.4	2.2	4.2	1.6	10.8	3.3	0.0	0.0	8.6	1.9	5.0	1.8

co-listener	distribution (%)													
choices	cultural origin				gender				years of age					
	natives		non-natives		females		males		<20		20-50		>50	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
want to listen	36.4	6.2	38.4	6.7	37.7	5.2	33.3	5.7	51.9	7.2	28.6	4.9	31.3	3.9
don't mind	24.7	4.6	22.6	5.4	24.5	4.2	25.0	5.1	7.4	2.8	28.6	3.7	34.4	5.6
feel excluded	20.8	5.0	21.3	3.8	22.4	3.7	16.7	3.6	22.2	4.5	23.8	4.1	12.5	2.4
feel disturbed	14.3	3.7	15.5	4.6	13.2	4.9	16.7	2.9	14.0	2.7	16.7	3.2	12.5	3.0
rest	3.9	1.6	2.2	0.7	1.9	1.1	8.3	2.3	3.7	1.8	2.4	1.6	9.4	2.2

Public domain

More than 90% of the subjects declared to have experience with a use of whispered speech in the public, and most of them admitted to remember perceptual experiences with whispered vocalizations of *other* people clearly better than instances when they were whispering themselves. Nevertheless, they provided quite a lot of further and interesting information about the contexts and the motives of their own whispering (Table 3.3). For example, they addressed their own whispered words mainly to one particular person only (65%), and this was either a close friend or a particular partner (e.g. the own mate), or a close relative, especially a child. If whispering was directed to two or more persons (24%), similar addressees were preferred.

An inquiry into motivational variables yielded a selection of specific responses. First priority replies to the question 'why did you whisper in the public?' e.g. were distributed as follows: 'In the first place, I whispered in order to ...

- (a) not disturb a given audience;
- (b) communicate a secret message to a specific person (partner, friend);
- (c) confirm affiliation to such an addressee;
- (d) initiate playful encounters, or just for fun; and finally,
- (e) attract the attention or induce curiosity in members of an audience.

Interestingly enough, the aspect (e) was cited also in a reverse sense, i.e., as a reason *not* to whisper in the public. For example, subjects argued that they avoided a use of unvoiced speech in order to not attract the notice of others and thereby disturbing them. Aside of this aspect, two well-known and wide-spread taboos were emphasized in this context: i.e., 'whispering is impolite', or 'whispering means lying'.

In more detail, opinions about whispering were evaluated for issues concerning the perceptible part of subjects, or role of a 'co-listener', respectively. According to their reporting, subjects remembered exposures to whispered vocalizations of other people who did not address them, surprisingly well. When commenting on such instances, they provided the following information (first priority):

- (a) I realized a desire to listen and to understand the speech;
- (b) I felt neither concerned about it nor disturbed by the sound;
- (c) I suspected that the speakers would talk about me, and felt excluded;
- (d) I felt simply disturbed by the whispering voices.

Again, these data did not show differences for the cultural origin of subjects. With respect to gender-related or age-class-related data distributions, on the other hand, some differences were found. These did, however, not exhibit any systematic effect (Table 3.3).

Conclusions

The general inquiry documented that whispering, although being relatively rare, can be regarded as a socially significant form of communication. In the private domain, it seemed to play a clearly positive role. There was evidence that it can serve to mediate tenderness, or even support the bond between mates. In the public, on the other hand, incidents of whispering were characterized as problematic, and thus restricted to specific situations only. This suggests that its rarity could be a consequence of the rarity of adequate situations.

Most findings of our general inquiry were not unexpected. Nevertheless, some appeared quite remarkable. This did hold, for instance, for the effect of social facilitation and also for the role of a 'co-listener'. As shown, experience with the latter was remembered better than most instances of personal involvement, i.e. cases of self-whispering or cases of being directly addressed by a whisperer. To further investigate this issue and also test other implications of the results, I established the following two hypotheses:

Ingroup-hypothesis: Whispering is a typical '*ingroup*'-signal. This implies that it can induce judgements of co-listeners, which depend on whether these feel socially either integrated or segregated.

Vigilance-hypothesis: Whispering can affect the psychophysical state of recipients, and in particular raise their auditory vigilance; thus, even 'outgroup'-people may feel a desire of 'co-listening'.

Experiments that investigated core-predictions of these hypotheses will be reported in the next section (3.2.) or in chapter 4., respectively.

3.2 Examination of the Ingroup-Hypothesis

The '*ingroup*'-hypothesis of whispering predicted that exposure to whispering should affect the social feelings of people. I expected that properties of such feelings could be investigated by presenting subjects with different sorts of auditory stimuli, first, and then testing whether their 'self-report' data indeed would document specific whispering-related judgements. The new experiments were designed to identify possible differences in the judgement of auditory stimuli that differed in *social* properties:

- a stimulus which simulated a report spoken by a single person,
- a stimulus which simulated a verbal conversation of two people
- a stimulus which simulated a verbal conversation of two people, but in addition included a phrase of laughter.

For control, stimuli were presented in two voice versions; i.e. a phonated voice and a whispered voice as well. In order to make the expected effects of social variables and voice quality as clear as possible and also to avoid any effect of verbal messages, we used artificial languages which subjects could not decode. The rationale of testing a monologue versus a dialogue was to better clarify possible outgroup-effects. I expected that subjects, in the first case, could feel as if they were addressed themselves, but probably not in the second case; i.e. if presented with a conversation of other people.

Methods

Experiment I

Participants were students of biology with a symmetrical gender distribution and a mean age of 25 (+/- 4) years. The group of participants (n= 104) was subdivided into 8 subgroups each comprising about 10-14 students. These subjects were invited into a sound-protected room and where they were placed in manner that allowed us to test them individually, and then exposed to a succession of 12 different auditory stimuli. Stimuli were presented via headphones, thus subjects could hear each stimulus simultaneously.

When preparing the experiments, 6 individuals (three females, three males) who were not involved in the experiments otherwise, helped us to produce verbal

stimulus material. This included (i) two classes of stimuli (in the following specified as stimulus 'report', or stimulus 'conversation'), (ii) each given in a phonated and a whispered version. The stimulus classes differed in the wording, but coincided in the following properties:

Stimulus report = Simulation of a report spoken in a strange language by a single person.

Stimulus conversation = Simulation of a dialogue spoken in a strange language by two persons.

All stimuli were sampled by a SONY MZ-R2 minidisc recorder equipped with a Sennheiser Me80 microphone, and then marked by a secret label for each speaker and finally incorporated in our pool of test material. Before a given test session, its stimulus material was chosen randomly from the pool.

During test sessions each subject was presented with six stimuli in total; i.e. the stimuli 'report' and 'conversation', each in a whispered version, and for control, also in a phonated version. Within a given session, we did not use material received from different speakers. Across different test sessions, however, this material as well as the succession of stimuli was changed randomly. For stimulus playback experiments, we used the minidisc recorder again that here was connected parallel a set of 14 Sennheiser headphones. This allowed for synchronous tests without any loss in sound quality. To simulate an almost 'natural' stimulation (see Figure 2.2), the amplitude of phonated stimuli was adjusted at about 65 dB, whereas that of the whispered stimuli was kept at about 50 dB. In addition, we took care that all stimuli had a similar duration, i.e. covered a span of 20 seconds. According to another study, (Wiedenmann & Todt 1992; Grahe & Bernieri 1999), this duration was long enough, for allowing subjects to get familiar with a given speaker's voice and to extract sufficient information for a judgement, but at the same time also not so long that subjects felt stressed or habituated to the stimuli.

Immediately after each playback, subjects were asked to judge a stimulus by using written questionnaires with bipolar adjective scales of 13 items that in pilot-experiments had proven to be well appropriate for this purpose. Besides items that, in terms of the studied objectives, were 'neutral' and served as simple fillers, the list included three pairs of items that were considered to be relevant. These were: 'pleasant/

unpleasant', 'unsuspicious/ suspicious', 'socially integrating'/ socially segregating'. Each item could receive three votes, with '3' as the strongest and '1' as the weakest choice. The vote '0' allowed voting for neutral or 'no decision'. With this structure, our questionnaires were in line with criteria outlined by Teske (1989).

In a first step of data analysis I evaluated the distribution of ratings or votes, respectively, and also the loading of items. In a second step, I compared the data across different subjects and test sessions and then related them according to the stimuli. For a final evaluation of data we used the judgement coefficient C_J and tested the calculated values by a two-tailed ANOVA. Statistical significance was accepted at a level of $p < .5$. Values of C_J were calculated according to:

$$C_J = (NNJ - NJ) / (NNJ + NJ)$$

Here, NNJ (= No Negative Judgement) represented the number of subjects who did not give a negative vote; whereas NJ (= Negative Judgement) gave the number of remaining subjects. The values of this algorithm could range between +1' and '-1', and values close to '-1' indicated possible differences among negative votes in a particularly clear manner.

Experiment II

Stimulated by the results of 'Experiment I', a second experiment was conducted. This was done with another group of participants and also with a different set of test material. However, subjects (n=98) were again students of biology with a symmetrical gender distribution and a mean age of 25 (+/- 3) years. In addition, also the methods of preparing and applying the stimuli, as well as the methods of recording and analysing response data, or judgments, respectively, remained the same as described for 'Experiment I'.

The new test material comprised two classes of stimuli that were specified as follows:

- Stimulus conversation = simulation of a dialogue of two speakers in a strange language.
- Stimulus conversation + laughter = simulation of a dialogue of two speakers in a strange language, but here containing a short phrase of laughter produced by one of the speakers.

Each stimulus class was available in six versions that differed in terms of speaker-origin and wording. For the tests, a version was selected at random, but it was guaranteed that such version was presented in both a phonated and a whispered version.

Results

With a few exceptions, subjects had properly treated their questionnaires. Thus, almost all of them were incorporated into our analyses. Analyses were concentrated on votes collected for the item pairs (a) 'socially integrating' / 'socially segregating', (b) 'pleasant' / 'unpleasant', (c) 'suspicious'/'unsuspicious'. In order to better detect possible negative judgements, positive votes were pooled with neutral votes, and only then compared to their opposites, or used to calculate the judgement coefficient C_J , respectively. That is, NNJ included all votes which not were collected by NJ. Such calculations were compared as follows:

- (a) NNJ= judgements for 'not segregating' versus NJ= judgements for 'socially segregating'.
- (b) NNJ= judgements for 'not unpleasant' versus NJ= judgements for 'unpleasant';
- (c) NNJ= judgements for 'not suspicious' versus NJ= judgements for 'suspicious';

Data analyses yielded two results (see Figure 3.1.). First, the judgments of phonated and whispered stimuli were significantly different [$F(1, 7) = 307.23$; $p < .0001$]. In particular, only the whispered stimuli had received large amounts of votes which indicated negative feelings of subjects (here: feelings of social segregation). Second and even more remarkably, these effects of whispered stimuli increased from stimulus 'report' to stimulus 'conversation', and this difference was significant, too [$F(2, 14) = 42.86$; $p < .0001$]. A similar result was not found for phonated stimuli [$F(2, 14) = 2.37$; $p = .13$].

The effects illustrated in Figure 3.1 appeared clearly for the item 'socially segregating', but they were similarly clear for the two other relevant items, as well. The data of these two other items ('not pleasant'; 'suspicious') are listed in Tables 3.4 & 3.5,

separately for each of the eight groups of subjects. In other words, the small differences among data collected for the three different items were statistically not significant [$F(1, 7) = 1.82; p = .26$].

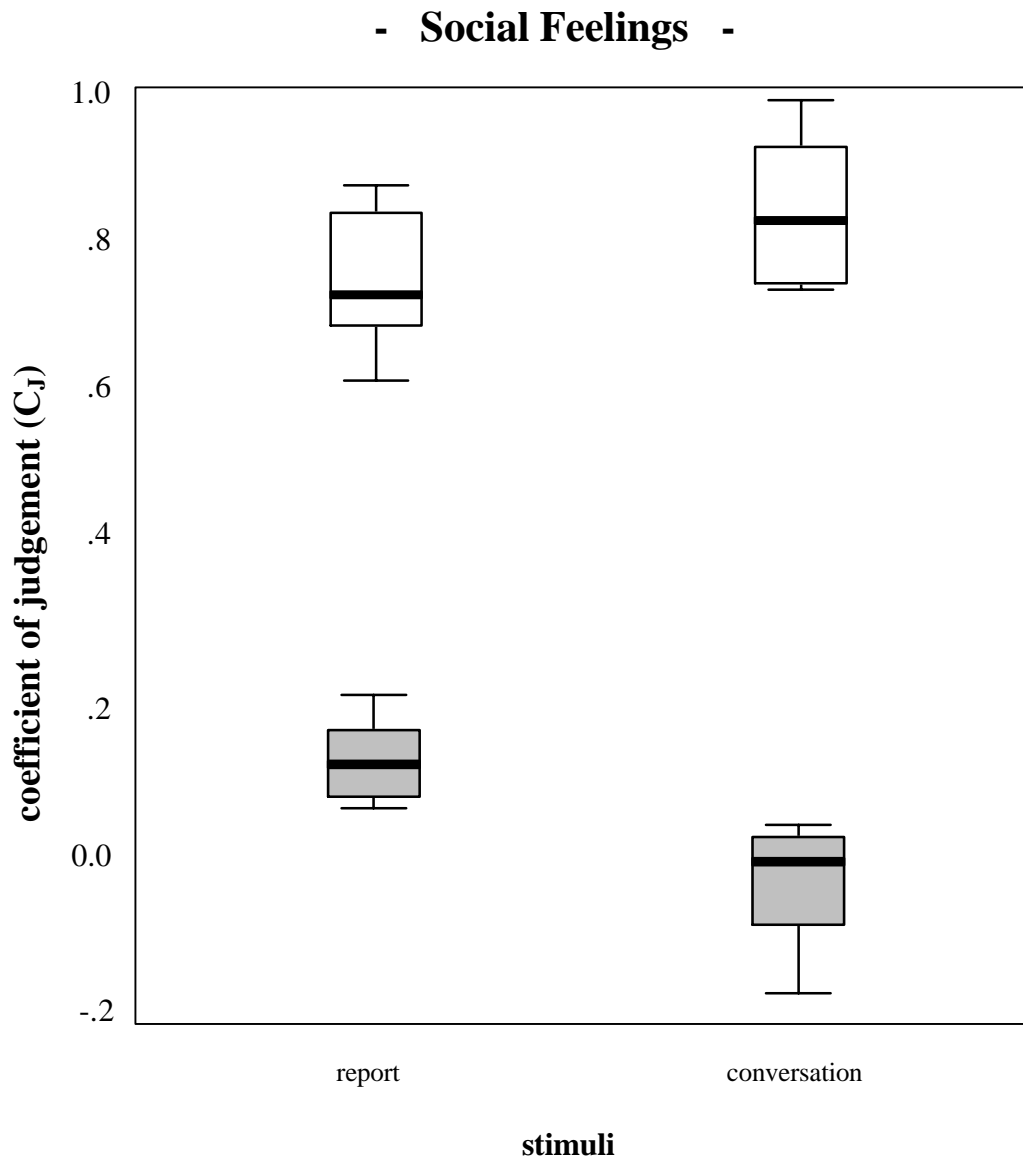


Figure 3.1 : Judgement of stimuli 'report' and 'conversation' given either in a phonated (top), or a whispered version (bottom). Boxplots refer to values calculated via the judgement coefficient C_j , for the item 'social segregation'. Here, data collected from eight different courses were pooled (see Tables 3.4 & 3.5). Values of C_j , which differ from '1.0' highlight the preference of negative judgements, or feelings of 'social segregation', respectively. Differences among C_j -values document that only whispered stimuli had induced such feelings in a clear manner, and these feelings increased in strength from stimulus 'report' to stimulus 'conversation'.

Table 3.4 : Judgements of stimulus 'report' (=R) and stimulus 'conversation' (=C) given either in a phonated or a whispered version. Data were calculated via the judgement coefficient C_j for the item 'not pleasant'. Values of C_j , which differ from '1.0' highlight the preference of negative judgements, or 'not pleasant' feelings, respectively. Here, data are given for each course or group of subjects separately.

not pleasant course	voiced		unvoiced	
	R	C	R	C
<i>a</i>	0.67	0.73	0.33	0.14
<i>b</i>	1.00	1.00	0.43	0.14
<i>c</i>	0.60	0.60	0.20	0.20
<i>d</i>	0.71	0.71	0.43	0.14
<i>e</i>	1.00	0.71	0.43	0.43
<i>f</i>	1.00	1.00	0.67	0.33
<i>g</i>	0.67	0.67	0.67	0.23
<i>h</i>	0.33	1.00	0.33	0.33

Table 3.5 : Judgements of stimulus 'report' (=R) and stimulus 'conversation' (=C) given either in a phonated or a whispered version. Data were calculated via the judgement coefficient C_j for the item 'suspicious'. Values of C_j , which differ from '1.0' highlight the preference of negative judgements, or 'suspicious' feelings, respectively. Here, data are given for each course or group of subjects separately.

suspicious course	voiced		unvoiced	
	R	C	R	C
<i>a</i>	0.67	1.00	0.33	0.33
<i>b</i>	0.53	1.00	0.43	0.14
<i>c</i>	0.60	0.60	0.60	0.2
<i>d</i>	0.71	0.71	0.43	0.14
<i>e</i>	1.00	0.71	0.43	0.29
<i>f</i>	1.00	0.67	0.67	0.33
<i>g</i>	1.00	1.00	0.33	0.00
<i>h</i>	0.63	1.00	0.33	0.33

Experiment II

To recall, stimulated by our finding that the values of C_j documented progressively more negative feelings, when the subjects, instead just hearing a whispered report, were

exposed to a whispered conversation; a novel test regime was developed and applied. This included a presentation of two classes of stimuli. One was given by a conversation which the subjects could not decode, the other one by a similar conversation that in contrast to the genuine conversation, however, included a phrase of laughter. Analyses of data collected from a new group of subjects yielded the following results:

First, an implementation of a whispered laughter into a whispered conversation had a strong effect on the self-report data of subjects. That is, judgements documenting an increase in their 'outgroup'-feelings were found for whispered, but not for phonated stimulus versions. Second, this effect was more prominent for the stimulus 'conversation + laughter' than for the stimulus 'conversation' (Figure 3.2.). Tables 3.6 and 3.7 give the calculated C_J values for the items 'not pleasant' and 'suspicious', separately for each of the eight groups of subjects.

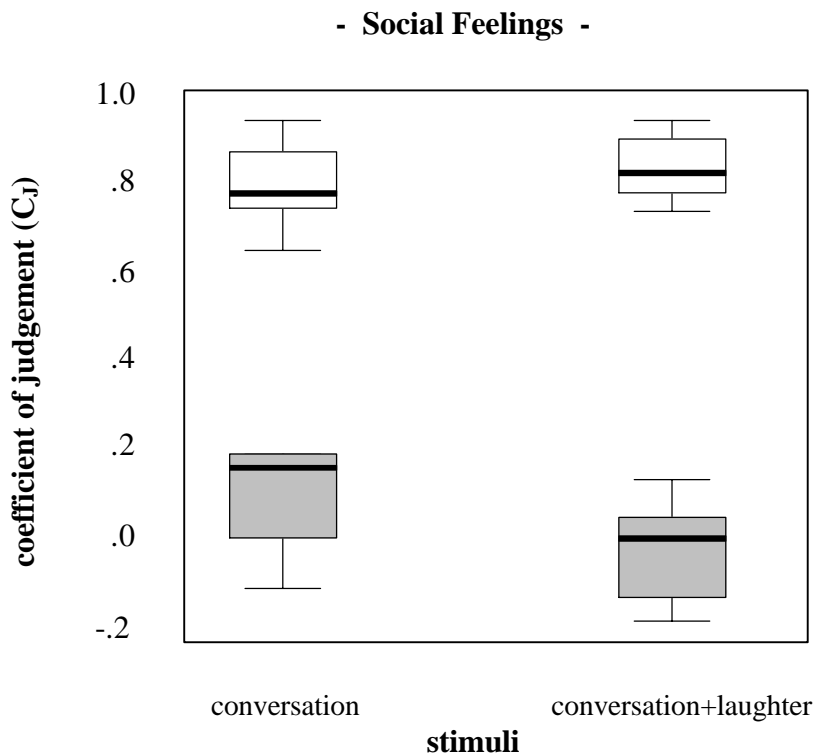


Figure 3.2 : Judgements of the stimulus 'conversation' and the stimulus 'conversation+laughter' given either in a phonated (top), or a whispered version (bottom). Boxplots refer to values calculated via the judgement coefficient C_J , for the item 'social segregation'. Here, data collected from eight different courses were pooled. Values of C_J , which differ from '1.0' highlight the preference of negative judgements, or feelings of 'social segregation', respectively. The differences among C_J -values document that whispered conversations with laughing had induced socially more negative feelings than whispered conversations without laughter.

Table 3.6 : Judgements of whispered and phonated versions of the stimulus 'conversation' (=C) and the stimulus 'conversation +laughter' (C+L). Data were calculated via the judgement coefficient C_j , for the item 'not pleasant'. Values of C_j , which differ from '1.0' highlight the preference of negative judgements, or 'not pleasant' feelings, respectively. Here, data are given for each course or group of subjects separately.

suspicious course	voiced		unvoiced	
	C	CL	C	CL
<i>a</i>	0.73	0.80	0.14	0.00
<i>b</i>	1.00	1.00	0.33	-0.14
<i>c</i>	0.81	0.92	0.18	-0.23
<i>d</i>	0.76	0.85	0.17	-0.23
<i>e</i>	1.00	1.00	0.23	0.14
<i>f</i>	0.83	1.00	0.33	0.33
<i>g</i>	0.85	0.92	0.23	0.00
<i>h</i>	0.80	1.00	0.33	0.00

Table 3.7 : Judgements of whispered and phonated versions of the stimulus 'conversation' (=C) and the stimulus 'conversation +laughter' (C+L). Data were calculated via the judgement coefficient C_j , for the item 'suspicious'. Values of C_j , which differ from '1.0' highlight the preference of negative judgements, or 'suspicious' feelings, respectively. Here, data are given for each course or group of subjects separately.

not pleasant course	voiced		unvoiced	
	C	CL	C	CL
<i>a</i>	0.80	0.80	0.27	0.33
<i>b</i>	0.71	0.85	0.33	0.14
<i>c</i>	0.86	1.00	0.17	-0.20
<i>d</i>	0.81	0.92	0.38	-0.14
<i>e</i>	0.83	0.83	0.23	-0.14
<i>f</i>	1.00	1.00	0.33	0.00
<i>g</i>	0.85	0.92	0.20	0.33
<i>h</i>	1.00	1.00	0.17	0.00

In addition, there was a further effect which was laid open when we inspected the distribution of negative ratings in more detail. An evaluation of these data documented that the number of subjects who provided strong negative votes was larger for stimulus 'conversation + laughter' than for stimulus 'conversation' (Figure 3.3.). And again: these effects occurred only in the experiments with whispered stimuli [$F(2, 14) = 24.76$; $p < .0001$], but not in those with phonated stimuli [$F(2, 14) = 1.86$; $p = .21$].

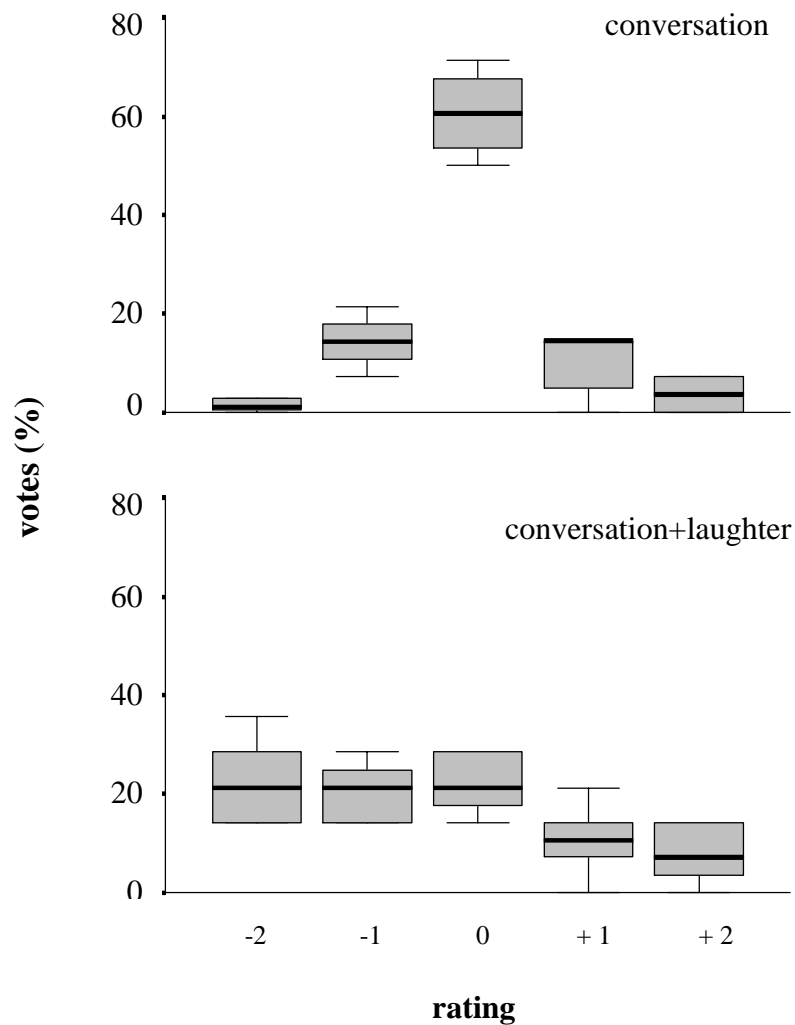


Figure 3.3 : Judgements of stimulus 'conversation' (top) and stimulus 'conversation+laughter' (bottom) given in a whispered version. Values of '-2' and '-1' refer to negative ratings (here: item 'social segregation'). Values of '+2' and '+1' refer to positive ratings (here: item 'social integration'). Values of '0' refer to neutral ratings or votes, respectively. Note: This measure expressed differences between effects of stimuli 'conversation' and 'conversation + laughter' more distinctly than values of C_j (see Fig.3.2.).

Conclusions

This study showed that the judgment of whispered speech did clearly differ from the judgment of normal (=phonated) speech. Additionally, there was a clear relationship between the social features of whispered stimuli and the induction of negative social responses. Negative feelings were more distinct when subjects had been exposed to the stimulus regime 'conversation+laughter', than during the stimulus regime 'conversation' or the stimulus regime 'report'.

I conclude that an auditory exposure to these stimuli had socially challenged our subjects and induced a stimulus parameter-related emerging of individual 'outgroup' feelings. The results suggest that different stimulus properties, as e.g. tested by the stimuli 'conversation' and 'conversation+laughter', can superimpose in inducing these effects. Since the appearance of such feelings had been predicted by the 'ingroup'-hypothesis deduced above, I conclude that my results can be taken as a good support for this hypothesis.

With respect to the goal of my study, the item 'social segregation' provided the most distinct cues; although the two other items ('unpleasant', 'suspicious') proved to be similarly appropriate. Given these results, it would be interesting to analyse also ratings received by other items. Since these were collected already, they could be used now to investigate the relationships among them, e.g. by a PCA (Principal Component Analysis). However, such an approach was not the aim of this thesis, and thus will remain a matter of a separate project.

3.3 Summary

The aim of this part of my thesis was to elucidate the 'ingroup'- properties of whispered speech. The methodological concepts and the analytical procedures which I used for this purpose were well established and included e.g. an evaluation of questionnaires and self-report data. The approach comprised two sections. The first one was a general inquiry

which aimed on surveying the spectrum of individual motives and experience related to a social use of whispering. The second approach was experimental and designed to clarify variables that seemed to be related to this social role. Data analyses yielded the following results.

In the inquiry, most subjects declared a personally positive attitude towards whispering. Also they emphasised that whispering can play a clearly positive role in privacy, for example, by mediating tenderness, or inviting playful encounters, or even supporting a bond between partners. Whispering in the public, in contrast, was classed as problematic and therefore restricted to specific situations only. Main motives of self-whispering were: (a) to not disturb a given audience (25%), (b) to communicate a private message to a specific person (partner, friend; 24%), (c) to signal affiliation to such an addressee (19%), to initiate playful encounters, or just for fun (13%), or to attract the attention or induce curiosity in members of an audience (12%). The main reports about a passive exposure to whispering in the public (or the role of 'co-listening') highlighted the following feelings: (aa) desire to listen and to understand the speech (37%), (bb) feelings of social segregation (21%), (cc) feeling just disturbed (14%). The evaluation of such results contributed to two hypotheses which subsequently were tested by playback experiments.

Ingroup-hypothesis: Whispering is a typical '*ingroup*'-signal. It can induce judgements which depend on whether a co-listener feels socially either integrated or segregated.

Vigilance-hypothesis: Whispering can affect the psychobiological state of 'co-listeners', and e.g. raise their auditory vigilance. This can concern even 'outgroup'-people.

The experimental approach reported in this chapter treated the '*ingroup*'-hypothesis only. The tests were conducted under standardised conditions and with students of biology as participants (n= 202, in total). Subjects were presented with 3 different classes of genuinely auditory stimuli. The stimuli simulated exposures to 3 socially different situations. Each stimulus was presented in a whispered version and, for control, also in a phonated version.

The results yielded by an evaluation of self-report data collected after a specific auditory stimulation of subjects, have shown that only the judgement of whispered stimuli, but not the judgements of controls, was clearly related to specific stimulus qualities. The preference of outgroup-feelings increased from the stimulus 'report' (i.e. a story spoken in a strange language) to the stimulus 'conversation' (i.e. a simulated conversation of two persons spoken in a strange language), and to 'conversation+laughter' (i.e. a simulated conversation of two persons spoken in a strange language that here contained an additional phrase of laughter). These results were statistically highly significant.

Our results suggest that different stimulus properties, as e.g. tested by stimuli 'report', 'conversation', and 'conversation+laughter', can superimpose in inducing individual 'outgroup'-feelings. As the induction of such feelings has been predicted by the one of the hypotheses deduced above, we conclude that our results can be taken as a good support for this hypothesis.