

# GROUP REHABILITATION OF PATIENTS WITH ACQUIRED HEARING IMPAIRMENT AND THEIR CLOSE RELATIVES: EVALUATION OF SHORT- AND LONG-TERM EFFECTS

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*Abstract: The aim of this study was to evaluate the effects of a two-weeks full-time group-rehabilitation program designed for hearing-impaired patients and their close relatives. Seventy-six consecutive patients in employment age (mean = 51 years; SD = 9 years, R = 22-64 years) with subjective need for audiological rehabilitation were included in the program. Pure tone averages were 46 dB HL and 58 dB HL at the low and high frequencies in the best ear, respectively. The patients responded to visual analogue scales (VAS) and questionnaires, intended to measure "perceived handicap", "social support", "perceived negative attitudes", "acceptance of hearing loss" and "communication strategies", before and after the last group session. The forms were also sent to the study group by post four and six months after the program was terminated. No significant short-term effects were found after the last group session, except that self-rated handicap in family life (VAS) was increased ( $p = 0.028$ ), probably due to the participants' increased awareness of hearing-related problems. Four months later, perceived negative attitudes from others were significantly reduced ( $p = 0.025$ ), but self-rated handicap in family life was still increased ( $p = 0.023$ ). Six months later (long-term effects), maladaptive strategies (e.g. guessing, pretending to hear and avoiding interactions) were significantly less often used ( $p = 0.036$ ) and verbal strategies more frequently adopted ( $p = 0.018$ ). This change of communication strategies might facilitate social participation and should therefore be seen as positive outcomes of a rehabilitation program.*

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## Introduction

Participation in social life could be seen as a human right for all people, including individuals with impaired hearing. According to the current understanding of the ICDH-2 classification, *impairment* refers to bodily function, *activity* refers to

daily activities and *participation* concerns societal involvement. Activity limitation, or disability, is seen as an interaction between contextual factors and the individual. Participation is the nature and extent of an individual's involvement in life situations in relationship to impairments, activities, health conditions and

contextual factors. Restricted participation (rather than handicap) is a disadvantage for an individual with an impairment that is created, or worsened, by environmental factors.

A hearing impairment often creates a communication barrier between individuals, leading to interruption of social interactions and thereby restricted participation in social life. One reason is that, regardless of age, reduced hearing sensitivity will make parts of the speech signal inaudible. According to Pichora-Fuller et al. (1998), communication includes two dimensions: a transactional (informational) dimension and an interactional (affective) dimension. Depending on the goals of communication (transactional or interactional) and the processing modes (surface or deep processing mode), different levels of miscommunication are likely to occur. Clinical encounters are commonly transactional and information-oriented, whereas interactional communication concerns social relationships, especially between women (Mc Kellin, 1994). Although a hearing impairment is associated with a number of disadvantages, Kerr and Stephens (1997) have reported positive experiences of acquired hearing loss for some people, such as reduced disturbance by unwanted sounds, self-development and affinity for other hearing-impaired and disabled people.

Often, family members interpret the consequences of a hearing loss as a lack of interest or lack of engagement in family matters on the part of the hearing-impaired person. Thus, frustration and

aggressive feelings are felt towards the hearing-impaired individual, rather than attributing the communication difficulties to the hearing loss itself. Jones et al. (1987) identified a tendency with normally hearing persons to underestimate the degree of the problem of their hearing-impaired partners. Van den Brink et al. (1996) argued that individuals who do not seek help for their hearing losses, most often demonstrate a passive acceptance of their hearing problems with increasing age. They perceive very few benefits with hearing aid use and, also, experience little social pressure to seek professional help. Men with noise-induced hearing loss (NIHL) are often unwilling or reluctant to acknowledge hearing difficulties (Blakie & Guthrie, 1984; Héту et al., 1990; Hallberg & Barrenäs, 1993; 1995), despite objective evidence of a verified hearing impairment. Such self-deception could be seen as self-protection against an undesired reality or it might serve to modify the reality to the individual's self-image. Denial or unwillingness to acknowledge hearing difficulties seems to exist cross-culturally among men with NIHL. This behaviour also corresponds with a gender difference in socio-linguistic strategies: women seem to give priority to social relationships and interactional strategies, whereas information-oriented, transactional communication dominates among men (Mc Kellin, 1994). According to Stephens et al. (1998), withdrawal from conversation and avoidance of social interaction can in some situations be seen as valuable face-saving strategies.

Much of the burden of a hearing loss rests on the family, especially on the spouse. Interviews with spouses of men with NIHL (Hallberg & Barrenäs, 1993) showed four different management patterns adopted by the spouses to deal with daily life, labelled: (1) mediating, (2) distancing, (3) minimising and (4) co-acting strategies. These strategies were related to two core concepts in the interview data, labelled "the husband's reluctance to acknowledge hearing-related problems" and "the impact of hearing loss on the couples' close relationship". It was obvious that spouses using mediating strategies had "double work" in taking responsibility for the husbands' ability to hear and being involved in social interactions. These women were in great need of support and professional help in coping with their stressful situation. Spouses using distancing strategies seemed to live their own lives, as the hearing-impaired husband preferred to watch the TV or read a book at home rather than participating in social life with his spouse. Spouses using minimising strategies tried to minimise and suppress their irritation over family problems caused by communication difficulties. These women also needed support from others in the same situation as well as from professionals. Co-acting strategies were used by spouses who shared their husbands' conception of reality and his reluctance to acknowledge hearing-related problems. These couples seemed to have less interactional problems in daily life, at

least at the time of the interview. All couples in the study were of employment age. Thus, close relatives would benefit from participating in audiological rehabilitation programs.

Audiological rehabilitation seems to be based on the implicit assumption that the goal of communication is primarily transactional, e.g. exchange of information. The interactional, or interpersonal, function of language, e.g. expression of social intercourse, should also be taken into account: talking fulfils both these functions of language (Johnson & Pichora-Fuller, 1994). Traditional rehabilitation programs often include prescriptions of hearing aids and supplementary devices and some kind of functional training course, i.e. lip reading training, focused on the transactional function of language. Johansson et al. (1991) stressed the limit of improvement that can be achieved by speech reading training: there is very little increase in performance after the first few hours of training. These authors suggest that vocabulary and social skills should be addressed in communication training. Lyxell and Rönnberg (e.g. 1992) and Tillberg et al. (1996) concluded that speech reading is correlated to certain linguistic processes, which are important to verbal intelligence. Information-processing components are assumed to predict individual differences in speech-reading ability. This means that speech-reading performance cannot be predicted by factors related to the hearing impairment.

Stephens and Héту (1991) defined

audiological rehabilitation as a problem-solving exercise aimed at the reduction of disability (i.e. fewer activity limitations) and the avoidance of handicap (i.e. increased social participation). In the last decade, group rehabilitation programs, based on similar definitions and designed for hearing-impaired individuals and their close relatives, have been more frequently used (e.g. Getty & Héту, 1991; Héту & Getty, 1991; Hallberg & Barrenäs, 1994). These psychosocial intervention programs are necessary complements to traditional audiological rehabilitation, which most often is focused on the hearing-impaired individual without enough attention to environmental conditions and consequences of the hearing loss for the family and close relatives.

### **Purpose**

The aim of this study was to evaluate a group rehabilitation program, designed for hearing-impaired individuals and their close relatives, over the short term (after the last group session) and over the long term (four and six months later). In line with the definition by Stephens and Héту (1991), the rehabilitation was then intended to initiate a problem-solving exercise aimed at the reduction of disability (i.e. less activity limitations) and the avoidance of handicap (i.e. increased social participation). The outcome variables were perceived handicap, social support, perceived negative attitudes, acceptance of hearing loss and communication strategies (i.e. maladaptive strategies, verbal and nonverbal strategies).

### **Method**

#### ***Subjects***

Seventy-six consecutive patients with acquired hearing loss were included in the study, 48 women and 15 men (unfortunately, information on sex was not recorded on data from 13 of the 76 patients). The inclusion criteria were: acquired hearing impairment, being of employment age, subjectively experienced handicap (restricted social participation), need for prescription of hearing aid, and a subjective need for audiological rehabilitation. Exclusion criteria were severe diseases, e.g. cancer and neurological diseases, and lack of ability to speak and understand Swedish.

The mean age of the 76 patients was 51 years (SD = 9 years; Range = 22 -64 years) and the duration of their exposure to workplace noise was on average 14 years (SD = 15 years; Range = 0-40 years). The educational background was on average 12 years of schooling (SD = 3 years; Range = 4-20 years). The mean hearing thresholds in the better ear were 46 dB HL (SD = 22) and 58 dB HL (SD = 25) at 0.5, 1 and 2 kHz and at 3, 4 and 6 kHz, respectively (Table I). No significant differences in hearing levels, age or years of education were found between men and women. However, men ( $n = 15$ ) had been exposed to noise significantly longer than the women ( $n = 48$ ); i.e. 20.6 years of noise exposure for men and 9.0 years for women with a standard deviation of about 14 years for both sexes ( $t = -2.48$ ;  $d = 19.2$ ;  $p = 0.023$ ).

Table I. Descriptive data on age, educational level, noise exposure and hearing thresholds in the study sample (n = 76).

| Variable               | Mean | SD |
|------------------------|------|----|
| Age (years)            | 51   | 9  |
| Education (years)      | 12   | 3  |
| Noise exposure (years) | 14   | 15 |
| PTA low (dB HL)        | 46   | 22 |
| PTA high (dB HL)       | 58   | 25 |

PTA low = 0.5, 1 and 2 kHz, best ear

PTA high = 3, 4 and 6 kHz, best ear

### *The rehabilitation program*

The rehabilitation program was broadly in line with the programs designed by Getty and Héту (1991) and Hallberg and Barrenäs (1994), although some modifications were made. Broadly, it was aimed at offering the participants and their proxies adequate information on hearing related issues, psychosocial support, and training in coping strategies and hearing tactics. The intervention was also intended to strengthen the subjects' self-esteem, and to initiate an active problem-solving process aimed at reducing communication difficulties and psychosocial distress within the family. The overall aim of the rehabilitation was to reduce disability (i.e. fewer activity limitations) and to avoid handicap (i.e. increased social participation).

The involvement of close relatives in group discussions and other activities over the week-end was aimed at facilitating mutual acceptance of the hearing disability. Both transactional and

interactional functions of communication, as well as medical, technical and psychological aspects of hearing loss, were explicitly focused on. Physical relaxation training was introduced by the physiotherapist and practiced by the patients in the program. Work-place visits were conducted and the patient's total social and work situation, including noise exposure, was considered.

The program was scheduled for two full-time weeks, during which the participants lived together in a boarding house with daily group sessions. The rehabilitation team included a psychologist/welfare officer, an audiologist, a medical doctor, a physiotherapist and a hearing engineer. The group sessions included continuous interactions with other people with the same type of disability as well as with professionals. Each rehabilitation group consisted of eight patients. During the weekend, the patients' relatives were invited and actively involved in the group sessions; i.e. the groups increased to 16 persons each.

### *Measurements*

Five standardized questionnaires were used:

(1) *The Hearing Measurement Scale* (Noble & Atherley, 1970), consisting of 42 items divided into seven subscales, intended to measure aspects of hearing disability and handicap. Three of these subscales (i.e. emotional response, tinnitus suffering and the opinion of the individual about the hearing difficulties) were used in an attempt to assess the perceived handicap (Noble & Atherley, 1970). These subscales included 13 items in total, in a 5-point response format ranging from "always" to "never": the higher the score the higher the perceived "handicap". The Swedish version of the HMS was developed by Eriksson-Mangold et al. (1992) and has ever since been used in many studies (e.g. Hallberg & Carlsson, 1991a; Hallberg & Carlsson, 1991b). The Swedish version of the HMS has shown a high internal consistency (coefficient  $\alpha = 0.91$ ).

(2) *The Hearing Handicap and Support Scale (HHS)*, consisting of three subscales with seven items in each subscale (i.e. perceived handicap, social support and negative attitudes from others), was used. The rating scale ranged from "strongly disagree" (1) to "strongly agree" (5). Originally, the scale was designed for patients with chronic pain (Funck & Gale, personal communication, 1984). The scale was later translated into Swedish and modified for patients with tinnitus (Erlandsson et al., 1992) and NIHL

(Hallberg et al., 1993). Illustrative items include "My hearing loss makes my relatives upset" and "Almost everything I do is affected by my hearing disability". The Swedish version of the HHS-scale has not yet been psychometrically evaluated.

(3) *The Acceptance of Illness Scale*, originally developed by Felton et al. (1984), later translated into Swedish (renamed the Acceptance Scale) and modified to assess acceptance of hearing loss as non-devaluing (Hallberg, 1994), was used. The scale consists of 8 items in a 5-point response format ranging from "strongly agree" (1) to "strongly disagree" (5). Illustrative items include: "I have had a hard time adjusting to the limitation of my hearing problems" and "My hearing problems make me a burden to my family and friends". The Swedish version of the Acceptance Scale has been psychometrically evaluated (Hallberg, 1994) and shows an adequate internal consistency (coefficient  $\alpha = 0.84$ ).

(4) *The Communication Strategies Scale* of the Communication Profile for the Hearing Impaired (Demorest & Erdman, 1987), consisting of 25 items in three subscales (i.e. maladaptive behaviour, verbal and nonverbal communication strategies). The rating scale ranged from "rarely/almost never" (1) to "generally/almost always" (5). Maladaptive behaviour was defined by Demorest and Erdman (1986) as "strategies detracting from or inhibiting the communication process", whereas verbal and non-verbal strategies were

intended to "enhance communication or at least to minimize the effects of the hearing loss". The scale was translated into Swedish, psychometrically evaluated (Hallberg et al., 1992) and used in several studies. Internal consistency reliability, coefficient alpha, was 0.77, 0.72 and 0.75, respectively, for the three subscales.

(5) *Visual analogue scales (VAS)*, a 100 millimetre line with the endpoints "not at all handicapped" (0) and "totally handicapped" (100), was used for an overall estimation of "perceived handicap" (i.e. restricted participation) in specific situations: e.g. family life, working life, and social life.

#### ***Procedure***

All patients fulfilling the inclusion criteria were informed about the project and requested to participate in a two-week group-rehabilitation program designed for a full-time stay at a boarding house. Informed consent was obtained and confidentiality was promised. During the two weeks program, the patients were granted sick-leave and received sickness benefit. Their close relatives were invited to join the program during the weekend.

#### ***Statistics***

Paired samples t-test on group mean differences (dependent sample) were conducted to explore the differences between assessments I and II (short-term effects after the last group session), assessments I and III (long-term effects four months after the last

group session), and assessments I and IV (long-term effects six months after the last group session) in the total sample. Confidence intervals (95 %) were estimated.

## **Results**

### ***Short-term effects of the group rehabilitation program***

To identify short-term effects of the intervention, questionnaire data were obtained before the start of the rehabilitation program (assessment I) and after the last group session two weeks later (assessment II). Descriptive statistics were calculated on all assessed variables, and paired samples t-tests were conducted. Self-rated handicap in family life, measured by a VAS, was significantly increased after the rehabilitation program (paired difference of means = - 5.17;  $t = -2.25$ ;  $df = 64$ ;  $p = 0.028$ ; 95 % confidence interval of the difference = -9.77 - - 0.57). No other significant short-term effects of the intervention were found (see Table II).

**Table II. Mean values and standard deviations for significant differences between assessment I and II (short – term effects).**

| Variable                                | Ass. I     | Ass. II    | P-value |
|---|------------|------------|---------|
| Perceived handicap in family life (VAS) | 28.2(19.8) | 33.3(22.4) | 0.028   |

VAS = Visual Analogue Scale

***Long-term effects of the group rehabilitation program***

To measure long-term effects of the rehabilitation program, questionnaire data were collected before the intervention started (assessment I) and four as well as six months (assessments III and IV, respectively) after the program was terminated. Assessments III and IV intend to measure long-term effects of the rehabilitation program. Between 61 and 65 subjects answered the questionnaires in assessments III and IV. Descriptive statistics were calculated on all assessed variables, and paired samples t-tests were conducted.

**The Hearing Handicap and Support Scale (HHS):** Perceived handicap, measured by a subscale of the Hearing Handicap and Support Scale, was significantly reduced four months after the rehabilitation (paired difference of means =  $t = 2.39$ ;  $df = 61$ ;  $p = 0.020$ ; 95% confidence interval = 0.25 – 2.78). A significant reduction of perceived negative attitudes from others, measured by a subscale of the Hearing Handicap and Support Scale, was found

four months after the rehabilitation (paired difference of means = 0.89;  $t = 2.30$ ;  $df = 61$ ;  $p = 0.025$ ; 95% confidence interval of the difference = 0.12 – 1.66).

**The Hearing Measurement Scale (HMS):** Hearing for non-speech sounds, measured by a subscale of the Hearing Measurement Scale, had significantly increased four months after the rehabilitation (paired difference of means = - 0.80;  $t = -2.24$ ;  $df = 59$ ;  $p = 0.029$ ; 95% confidence interval of the difference = -1.52 - - 0.08).

**Visual Analogue Scales (VAS):** Self-rated handicap in family life (paired difference of means = - 5.26;  $t = -2.34$ ;  $df = 60$ ;  $t = 0.023$ ; 95% confidence interval of the difference = - 9.76 - - 0.76) and in social life (paired difference of means = - 4.57;  $t = -2.03$ ;  $df = 60$ ;  $p = 0.046$ ; 95% confidence interval of the difference = - 9.07 - - 0.07), measured by visual analogue scales (VAS), had significantly increased four months after the rehabilitation (Table III).



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**Table III. Mean values and standard deviations for significant differences between assessment I and III (four months after the treatment).**

| Variable                                 | Ass. I     | Ass. III   | P-value |
|--|------------|------------|---------|
| Perceived handicap (HHS)                 | 22.7(5.8)  | 21.2(5.9)  | 0.020   |
| Perceived negative attitudes (HHS)       | 14.6(3.7)  | 13.7(4.0)  | 0.025   |
| Hearing for non-speech sounds (HMS)      | 5.7(2.8)   | 6.5(2.7)   | 0.029   |
| Self-rated handicap in family life (VAS) | 28.2(19.8) | 33.3(20.4) | 0.023   |
| Self-rated handicap in social life (VAS) | 31.6(22.4) | 36.8(23.3) | 0.046   |

HHS = Hearing Handicap and Support-scale  
HMS = Hearing Measurement Scale  
VAS = Visual Analogue Scale

The Communication Strategies Scale (CSC): Maladaptive strategies, measured by the Communication Strategies Scale, were significantly less often adopted by the patients six months after termination of the rehabilitation program compared to pre-intervention scores (paired difference of means = - 0.17;  $t = -2.15$ ;  $df = 59$ ;  $p = 0.036$ ; 95% confidence interval = - 0.34 - - 0.01). Verbal communication strategies were significantly more often used six months after the rehabilitation program, (paired difference of means = - 0.23;  $t = -$

2.43;  $df = 59$ ;  $p = 0.018$ ; confidence interval of the difference = - 0.43 - - 0.04). No significant difference was found in non-verbal strategies (Table IV).

No significant long-term effects of the intervention were found in social support and acceptance of hearing loss. No systematic evaluation was conducted concerning the hearing impaired subjects' benefit by the close relatives' participation, or the close relatives' benefit of participating, in the program during the weekend.

**Table IV. Mean values and standard deviations for significant differences between assessment I and IV (six months after the treatment).**

| Variable                      | Ass. I   | Ass. IV  | P-value |
|-------------------------------|----------|----------|---------|
| Maladaptive behaviours (CSC)* | 3.7(0.6) | 3.9(0.6) | 0.036   |
| Verbal strategies (CSC)       | 3.1(0.8) | 3.4(0.9) | 0.018   |

CSC = Communication Strategies Scale  
\* = reversed scoring

## Discussion

The aim of this study was to evaluate the short- and long-term effects of a group rehabilitation program designed for individuals with hearing disability and their close relatives. The study group was composed of severely hearing-impaired individuals of employment age, reporting subjective feelings of handicap and restricted participation in social activities. To prevent the potential risk of disability pension due to hearing loss, patients of employment age suffering from hearing disability in Sweden were offered sick-leave with economic compensation from the Insurance Company when participating in this two-week full-time rehabilitation program. For ethical reasons, all consecutive patients at our hearing clinic fulfilling the selection criteria were invited to take part in the study. Thus, the study design lacks a control group. Comparisons have been conducted of self-reported scores before and after intervention: the subjects have been their own controls. Although the one-group pre-test/ post-test design is frequently used in social science research, it is not sufficient for allowing causal hypotheses. This is, of course, a weakness in our study. However, as mentioned above, for ethical reasons all patients fulfilling the criteria for sick-leave with economic compensation were invited to take part the rehabilitation program.

Evaluation of any rehabilitation program is a considerable challenge to

the practitioner as well as to the researcher. Information regarding therapy outcome is important to clinicians and provides justification for use of a particular therapy method (Stephens et al., 1998). Which are then the expected outcomes of a psychosocial rehabilitation program, and how can these outcomes be operationalized and adequately captured in standardised questionnaires? According to Cox et al. (2000), audiological rehabilitation research is often limited to small groups, and self-report outcome measures are not highly sensitive instruments. These authors argue that the optimal measure should assess benefit in terms of disability reduction (increased activity) as well as handicap reduction (increased participation) and, also, be sensitive to the cultural environment.

In our opinion, an overall general aim of audiological rehabilitation is to facilitate participation in society for people with a communication difficulty, such as impaired hearing. According to a qualitative study by Hallberg and Carlsson (1991a), a hearing impairment causes an invisible communication barrier with demands of adaptation from both the speaker and the listener. Two main coping patterns, labelled controlling the scene and avoiding the scene, were also identified in the interviews with hearing impaired adults. Maladaptive strategies or behaviours, a concept adopted by Demorest and Erdman (1986) in developing the Communication Strategies Scale, include avoiding social interactions and

communication situations. According to these authors, maladaptive behaviours detract from or inhibit the communication process. A frequent use of maladaptive behaviours related significantly to high scores on self-reported handicap, measured by the HMS, in individuals with hearing disability (Hallberg & Carlsson, 1991b). According to this finding, the present rehabilitation program gave desired significant long-term effects in outcome variables measuring coping behaviour. The result shows that, six months after the group rehabilitation program, maladaptive strategies, such as guessing what was said, pretending to hear and avoiding social interactions were adopted significantly less frequently. Also, verbal strategies, such as asking for repetition, informing people about the hearing loss, or requesting others to speak up, were significantly more often adopted by the patients six months after the rehabilitation. According to Demorest and Erdman (1986), verbal strategies enhance communication, or at least minimize the effects of hearing loss. Therefore, such changes in coping behaviours, i.e. less maladaptive behaviours and more verbal communication strategies, might result in improved interactional and transactional functions of communication and increased participation in social life. Close relatives are frequent communication partners for hearing impaired individuals and therefore the acquisition by proxies of new knowledge about adaptive

communication strategies might have contributed to the reported changes. Although the differences in terms of scores were minor, significant changes were found.

Interestingly, the results of the study showed that, despite less negative attitudes from others (measured by a subscale of the HHS), self-rated handicap in family and social life (measured by the VAS) was increased at the end of rehabilitation as well as four months after the rehabilitation. This might be due to the hearing impaired subjects' increased awareness of their hearing difficulties. Also, after the intervention program, their own as well as their proxies' expectations of progression in communication ability might be increased. The intervention as such focused on all aspects of living with hearing loss and thereby more or less repressed, and forgotten negative consequences may emerge. This increased awareness might contribute to feelings of "handicap". Actively working through negative feelings in interaction with supportive surroundings takes time and energy, but might in the longer run lead to increased emotional well-being.

Contrary, perceived handicap in general, measured by a subscale of the HHS, had decreased four months after the rehabilitation. One aim of the intervention was to reduce handicap and to facilitate social participation, and therefore this result was highly desirable. However, it does not fit well with results from the VAS-scales, representing magnitude estimation

technique. It might be that the HHS was easier for the subjects to respond to than was the visual analogue scales. The seven questions of the HHS had a wide range of response choice (1 to 5), probably making the alternatives more distinct to the subjects. A format ranging from a negative (not at all handicapped) to a positive pool (totally handicapped), such as the present VAS, implies that people have an unipolar dimension in mind, referring to different degrees of the same feeling (Schwarz, 1999). According to Schwarz (1999), minor changes in response format or question context can, due to underlying cognitive processes, result in major changes in obtained results. Understanding a question in a way that allows an appropriate answer requires understanding the literal and pragmatic meaning of the question.

Schwarz (1999) addressed the underlying cognitive and communicative processes in self-reports of behaviours and attitudes. The respondent is expected to use a "recall- and-count" model: i.e. to identify the intended behaviour, to search the memory for relevant episodes, to date these episodes to the reference period and, finally, to count them and arrive at a numeric answer. Schwarz argues that self-reports are likely to be based on fragmented recall and the application of inference rules to compute a frequency estimate. Given that the aim of rehabilitation is to increase social participation for patients with hearing impairment, the social situation,

environmental conditions, as well as personality, of each individual should be taken into account in an individualized and contextualised evaluation of the outcome. Such an evaluation might require in-depth interviews and qualitative analysis or it could be based on single-subject research designs. In an earlier study (Hallberg & Barrenäs, 1994), a taped oral evaluation, conducted at the end of the last group session in a similar intervention program as the one reported in this paper, showed that the participants were subjectively more aware of the consequences of the hearing loss and, also, that they felt more confident in coping with the situation. At the same time, quantifications of predefined rehabilitation outcomes showed minor improvements.

In the present study, hearing for non-speech sounds was significantly increased four months after the rehabilitation, which might be explained by improved hearing tactics. Environmental sound awareness, i.e. the ability to hear sounds other than speech, contributes to security and self-confidence in all individuals. Also, increased ability in hearing non-speech sounds might enhance the communication process and the participation in social life for the participants in the rehabilitation program.

According to Silverman (1977), clients' attitudes toward an intervention program or therapy method and its effects on their behaviour can reduce or enhance the effectiveness of the

intervention. Our impression is that both the patients and their close relatives were actively engaged in the intervention program. Proxies were only present during the weekend and, unfortunately, their contribution to the participants' behaviour changes was not systematically assessed. However, we argue that any rehabilitation program initiates a problem-solving process. This will also be the case with the present intervention design, including proxies during the weekend. The effects might not be visible, and measurable, until a long time after the intervention. Silverman (1977) argues that positive attitudes and reinforcement from close relatives affects the individual to invest more time and energy in a therapy program than if no reinforcement is received. Proxies should therefore be involved in any audiological rehabilitation program. In our future research and practice, their contribution, thoughts and behaviours will also be taken into account in evaluating the effects of rehabilitation programs.

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## Group rehabilitation of patients with acquired hearing impairment and their close relatives: Evaluation of short- and long-term effects

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