

## COMMUNICATIVE SUITABILITY OF STUTTERED SPEECH

R. van Bezooijen\* and M.C. Franken\*\*

\* University of Nijmegen, Nijmegen, The Netherlands

\*\* Academic Hospital, Rotterdam, The Netherlands

### ABSTRACT

This study investigated the merits of the concept of communicative suitability, i.e. judged adequacy of speech for use in everyday communicative situations, for assessing the quality of stuttered speech. General acceptability was also judged. Stutterers, non-stutterers, and speech therapists served as judges. Communicative suitability seems a promising criterion to realistically evaluate speech quality.

### INTRODUCTION

Various methods have been developed to normalize speech fluency of stutterers. Some therapies use so-called fluency enhancing techniques, which affect prosodic and temporal aspects of speech. A widely used criterion for assessing the resulting speech quality has been judged naturalness (e.g. [1,2]). It appears that fluency shaping therapy changes unnatural sounding stuttered speech into unnatural sounding stutter-free speech. However, it is difficult to evaluate this finding. How exactly should the rather abstract and global concept of naturalness be interpreted and translated to suitability of speech for use in everyday life with all its variation in communicative settings, communicative goals, and types of communicators? And to what extent do judgments from "ordinary" people, not involved in problems of stuttering, differ from those given by stutterers and speech therapists specialized in stuttering?

The main goal of our study, then, was to try and develop an alternative, more sociolinguistically based approach to the evaluation of stuttered speech

and explore the merits of the concept of communicative suitability, i.e. judged adequacy of speech for use in everyday communicative situations. Three questions were asked:

- (1) Do suitability judgments vary as a function of the situation?
- (2) Do suitability judgments of stutterers, speech therapists, and non-stutterers differ?
- (3) How do suitability judgments relate to general acceptability?

### METHOD

Speakers were 10 stutterers and 10 non-stutterers. The 10 stutterers took part in the Dutch adaptation of the Precision Fluency Shaping Program [3]. They were recorded three times: pre-treatment, immediately after treatment ("post-treatment") and six months after treatment ("follow-up treatment"). All were males, of varying ages and from varying educational backgrounds. Many had a regional accent. The 10 non-stutterers, matched for sex, age, education, and accent with the 10 stutterers, served as distractors and as a reference. The stimuli for the judgment experiment consisted of 45 sec semi-spontaneous speech samples. They were presented to three groups of each 17 listeners: (1) "ordinary", non-stuttering adults, (2) speech therapists specialized in stuttering, and (3) stutterers involved in stuttering modification therapy [4]. The 51 judges rated suitability scales (1=completely unsuitable, 10=perfectly suitable) for communicative situations varying in (1) the setting (private versus public domain), (2) the number of persons spoken to (single versus

multiple interlocutor), (3) the relation to the person spoken to (known versus unknown interlocutor), and (4) communicative function (social versus informative). Plausible combinations of these four factors resulted in the ten communicative situations listed below, ordered from most informal to most formal. Uneven numbers refer to situations stressing the social function, even numbers to situations stressing the informative function, except for 9 and 10, where the distinction could not be made.

- + private, + single, + known
- 1. talking about everyday events with a friend
- 2. telling a housemate about one's new job
- + private, - single, + known
- 3. chatting with housemates during a party game
- 4. giving a speech at a family celebration
- private, + single, + known
- 5. making conversation with a friend in the train
- 6. ordering bread from the baker around the corner
- private, + single, - known
- 7. getting into contact with a stranger on the bus
- 8. asking a bypasser for directions
- private, - single, - known
- 9. instructing a group at a dancing school
- 10. giving a lecture to a newly founded professional association

After judging the suitability of the speech sample for each situation, the listeners rated the general acceptability (1=completely unacceptable, 10=perfectly acceptable) of each speech sample on a separate, eleventh scale, not tied to a specific situation.

The reliability of the ratings was assessed, separately for the 11 scales and the 3 listener groups, by means of Cronbach's alpha. All alpha's exceeded

.95, which shows that all three groups of listeners agreed on the relative suitability of the speech samples for use in various communicative situations and on their general acceptability.

### RESULTS AND DISCUSSION

Separate analyses of variance were carried out for the suitability ratings and the acceptability ratings. The level of significance was set at 5%. We will only present and discuss significant effects directly bearing upon the three questions asked in the introduction.

#### *Do suitability judgments vary as a function of the situation?*

The factor "situation" had a significant effect on the suitability ratings, explaining as much as 27% of the variance. This means that judges strongly differentiated their judgments depending on the specific characteristics of the communicative situation in which the speech was supposed to be used. The ratings for the ten communicative situations are listed in Table 1. The data show that the order of judged suitability corresponds with degree of formality: speech was judged least suitable for the most formal situations 9 and 10 and most suitable for the least formal situation 1. The other situations, with intermediate degrees of formality, received intermediate ratings of suitability. This holds for the stuttered speech at different stages of treatment as well as for the reference speech. So, judges consistently place higher demands upon the quality of speech as the situation is more public, involves a greater number of less well-known interlocutors, and focusses more on information transmission.

We think that the variation in the height of the suitability ratings has to do both with linguistic and extra-linguistic factors. At the linguistic level, intelligibility can be assumed to play a role. That is, the typical charac-

teristics of formal communicative situations, e.g. high information density, listener(s) unfamiliar with (the speech style of) the speaker, large distance between listener(s) and speaker, require speech that is clearly enunciated, without deviant and unpredictable properties. This would be a functional reason. At the extralinguistic level, there are social conventions, which dictate, for example, a particular style of clothing (tie, suit) but also a particular style of speaking, represented by the standard variety (RP, standard Dutch), without pathological or dialectal deviations.

Table 1. Mean judged suitability (1=completely unsuitable, 10=perfectly suitable) of stuttered speech (pre-, post-, follow-up) and reference speech for ten communicative situations. In the last column overall means, which have served as the basis for the ordering from lowest to highest suitability.

No	Context	Pre	Post	Fol.	Ref.	All
9	group/instructions	2.4	3.0	3.5	5.7	3.6
10	association/lecture	2.4	3.1	3.6	5.8	3.7
4	family/speech	3.2	4.1	4.4	6.7	4.6
7	stranger/bus	3.9	4.9	5.2	7.3	5.3
8	bypasser/directions	4.2	5.4	5.6	7.5	5.7
6	baker/bread	4.5	5.7	5.8	7.6	5.9
5	friend/train	4.8	5.7	6.0	7.7	6.0
3	housemates/party game	5.0	5.7	6.1	7.7	6.1
2	housemate/job	5.1	5.8	6.1	7.7	6.2
1	friend/everyday events	5.4	6.0	6.4	8.0	6.4
All		4.1	4.9	5.2	7.2	

### *Do suitability judgments of stutterers, speech therapists, and non-stutterers differ?*

There was a significant effect of the factor "type of judge", accounting for 9% of the variance. The mean suitability ratings, averaged over the four types of speakers, given by the stutterers, therapists, and ordinary people were 5.9, 5.6, and 4.6, respectively. So, the data reveal that overall ordinary people are considerably less tolerant in their judgments than therapists, who in turn are somewhat stricter than stutterers. This

pattern emerged for each speaker group separately as well. Perhaps therapists and stutterers are less sensitive to deviations in speech as a result of repeated exposure to deviant speech. Apparently and quite remarkably, the differential sensitivity would hold not only for pathological deviations such as stutters, but for dialectal aspects of speech as well (as mentioned under Method, many reference speakers had regional, non-standard accents). Also, therapists and stutterers may be milder because they know from experience how difficult it is get rid of deviant speech characteristics. The difference between ordinary people on the one hand and therapists and stutterers on the other holds particularly for the less formal situations (the interaction between "situation" and "type of listener" accounts for 2% of the variance).

### *How do suitability judgments relate to general acceptability?*

The mean general acceptability ratings closely resemble the results for the suitability data averaged over ten communicative situations. The acceptability ratings of 3.6, 4.5, 4.9, and 6.9 for the pre-treatment, post-treatment, follow-up treatment, and reference speakers can be compared to the suitability ratings of 4.1, 4.9, 5.2, and 7.2. The acceptability ratings of 5.6, 5.0, and 4.3 for the stutterers, therapists, and ordinary people can be compared to the suitability ratings of 5.9, 5.6, and 4.6. Also, for both types of judgments similar patterns of significant effects were found. The grand mean of the general acceptability ratings is 5.0, which constitutes the exact midpoint of the suitability continuum as used by the judges, with the extremes 3.6 and 6.4.

### CONCLUSION

Communicative suitability appears to be a useful approach to assessing

speech quality since it does justice to everyday reality where different demands are placed upon speech depending on communicative settings, interlocutors, and goals. It is further shown that it is dangerous to generalize judgments from persons used to stuttering, such as speech therapists and stutterers, to the type of people stutterers will usually interact with in everyday life. The norms of the latter appear to be stricter. These findings should be taken into account when evaluating the communicative consequences of stuttering and the effects of stuttering therapy. Finally, general acceptability appears a useful scale to measure "average" suitability. Further research is needed to examine the relationship between general acceptability and naturalness.

### ACKNOWLEDGMENT

The contribution by the first author has been made possible by a fellowship from the Royal Netherlands Academy of Arts and Sciences. The authors wish to thank Anneke Olierook en Margot Spanhoff for collecting the data.

### REFERENCES

- [1] Runyan, C.M., Bell, J.N., & Prosek, R.A. (1990), "Speech naturalness ratings of treated stutterers", *Journal of Speech and Hearing Disorders*, vol.55, pp.434-438.
- [2] Franken, M.C., Boves, L., Peters, H.F.M., & Webster, R.L. (1992), "Perceptual evaluation of the speech before and after fluency shaping stuttering therapy", *Journal of Fluency Disorders*, vol.17, pp.223-242.
- [3] Webster R.L. (1980), "Evolution of a target-based behavioral therapy for stuttering", *Journal of Fluency Disorders*, vol.5, pp.303-320.
- [4] Peters, T.J., & Guitar, B. (1991), *Stuttering. An integrated approach to its nature and treatment*, Baltimore: Williams & Wilkins.