

IMPROVED FLUENCY BY INTERVENTION WITH AN ELECTRONIC DEVICE

A SINGLE CASE STUDY OF A BOY, 4:3 YEARS

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Introduction

The purpose of this study was to evaluate the effect of a device for altered auditory feedback on a child's stuttering over an extended period of time. Evaluation of the child's speech production was made in every-day speaking situations, with and without the influence of DAF/FAF.

Theoretical background

Goldberg (1991) proposed the existence of two routes for speech motor activity: the medial and the lateral tract. The lateral tract is activated during conscious coordinated movement, and can be helpful in reducing symptoms which are caused by a dysfunction in the medial tract, basal ganglia, for example with Parkinson's disease (Goldberg 1991) or with stuttering (Alm 2004).

Hypothesis (Henriksen & Solheim 2007)

Technical intervention with DAF/FAF in persons who stutter may work by blocking the dysfunctional medial motor tract while activating the lateral tract. If the intervention is initiated while the brain is still plastic, it may be possible to induce persistent fluency as the brain re-modulates to circumvent dysfunctional nerve tracts.

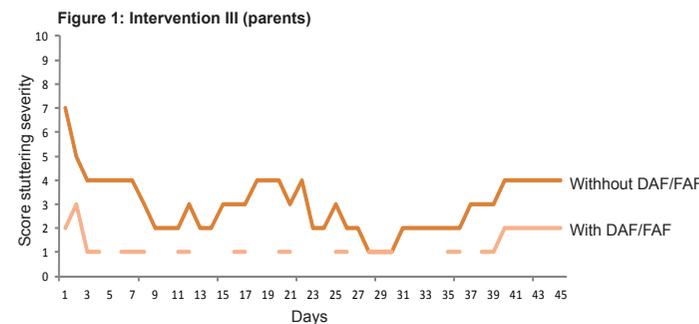
Research questions

- What changes in fluency are found in the use of an electronic device?
- Are changes in fluency reflected in the parental evaluation?
- Are the changes in fluency maintained in a longer term period?

Methodology and data

A single case study of a boy (HO), 4;3 years old, with severe stuttering. Stuttering onset: 3:2 years. The parents report adequate language skills.

Conversations with HO were recorded pre-therapy, within-therapy and immediately post-therapy. The percentage of syllables stuttered (SS%) was calculated from the audio- and videotaped recordings. Severity ratings originally developed for use in the Lidcombe-programme (1=no stuttering, 10=severe stuttering) were collected, including a survey of when the device was used and for how long. The parents administered the electronic device at home, and rated HO's speech twice a day with respect to their general impression of their son's speech with and without the device (figure 1).



Electronic device

Some people who stutter are more fluent when exposed to Delayed Auditory Feedback (DAF) and Frequency Altered Feedback (FAF).

SmallTalk from Casa Futura Technologies and SpeechEasy from Aurismed are used as technical devices in this study.

Table 1: Percentage of syllables stuttered

Pre-therapy	Intervention I (SLT):	Intervention II (SLT):	Intervention III (SLT):	2 months follow-up
February: 18,1 SS%	Without DAF: 19,3 SS%	Without DAF: 19,5 SS%	Regular speech	Without DAF: 3,1 SS%
April: 21,4 SS%	With DAF: 0,0 SS%	With DAF: 0,0 SS%	meases from parents,	
June: 19,3 SS%	Immediately after: 1,6 SS%		see figure 1.	
	With DAF x 2: 0,5 SS%			

Results

This single case study finds evidence for fluency enhancement under DAF/FAF conditions. A carryover effect was observed immediately after the intervention as well as for some time following the device offset, see intervention I, table 1. The result shows a positive tendency for HO's fluency of speech also without DAF/FAF conditions, see table 1 and figure 1. This finding seems to support the importance of early intervention, when the brain has its greatest potential for plastic change.

Further discussion

Can the brain's plastic potential be exploited in a more effective way in stuttering therapy for children? Could a parallel hypothesis be presented for evaluating for example the effect of the Lidcombe program? Here the parents are instructed to give direct feedback to the child, including encouraging the child to repeat his or her utterance in a more controlled matter (Henriksen, Solheim, Sønsterud, Jablonski & Dietrichs 2007).



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