CONTROL OF STUTTERING BEHAVIOUR THROUGH RESPONSE CONTINGENT SHOCKS

J. BHARATH RAJ

Introduction

Several recent studies have brought stuttering under operant control and shown how it can be manipulated by the consequences it generates. Goldiamond (1965) and his colleagues have demonstrated through their extensive studies, that a very high degree of such control over speech, can be achieved. Using either a high intensity white noise of a 105 dB blast (Flanagan *el al.* 1958) or DAF (Goldiamond 1962) as the punishing stimuli, contingent upon stuttering it has been shown that stuttering decreases dramatically. The present study has been undertaken to validate these findings with stutterers in our cultural set up and to see the possibility of delineating those variables, which might be intimately related to stuttering, affecting improvement, positively or negatively.

The Problem: The aim was to study the effects of response contingent shocks on stuttering behaviour. For the purposes of present study stuttering has been considered to be characterised by both the primary observable behaviour features, like repetitions and or prolongations of sounds and syllables, and the secondary observable behavioural features like protrusion of the tongue, puccaring of lips, raising of eye brows, tight eye closure, etc.

The Method: The subjects were all males between the ages of 20-25, with a minimum of S.S.L.C. education, who registered at the All India Institute of Speech and Hearing for their stuttering problem.

A pretherapy evaluation done independently by a clinical staff, the student therapist and the self evaluation by the subject, on a special proforma served to give a composite quantitative estimate of stuttering rate for each subject.

On the same lines a composite quantitative estimate of post therapy stuttering rate was obtained for each subject.

In all, three base rate sessions were obtained for each subject. Base rate I refererd to the frequency of stuttered responses while reading'spontaneous speech. Base rate 2, referred to, the frequency of stuttered responses while

Dr. J. Bharath Raj, M.A., Ph.D. D.M.P., Reader and Head: Psychology Deptt., AIISH, Mysore.

reading/spontaneous speech with electrodes attached but no shock. Base rate 3 referred to the frequency of stuttered responses while reading after therapy. Each session with a subject lasted for 20 minutes.

For purposes of treatment a clearly delineated stuttering response/s was chosen and base rates being obtained on this, this chosen response/s was subjected to response contingent shock. Electric shock was preferred to the other types of aversive stimuli, because of its established aversive characteristic and that it could be varied in intensity levels over a range.

As the reading rate is intimately related to the stuttering rate of the subject, ideally speaking it would have been better to record the reading rate. But this was difficult to be achieved as it would have distracted the subject too often during the sessions. However efforts were made by instructing the subjects to maintain their reading rates constant all through the sessions.

A specially designed Electro-shock apparatus was used to deliver shocks immediately after a stuttered response was observed. It consisted of an voltmeter with a provision for step-wise increment in voltages from 0 to 120 volts, an ammeter to indicate the flow of current between the electrodes, an electromagnetic counter to record the number of shocks delivered, and two steel electrodes with strapes which could be easily tied to the forearm of the subject.

Chosen passages, in English or Kannada were used as stimulus material which the subjects read. In some cases where this was not feasible the subject, was asked to speak spontaneously on a previously assigned topic.

The subject and therapist sat facing each other on either side of a table on which rested the Electro-shock instrument. With the electrodes being tied on the dorsal surface of the left forearm of the subject after application of electrode paste, each subject received contingent negative stimulation i.e., shock at every occurrence of the chosen response.

The levels at which the shock was 'just detectable', 'painful' and 'most painful' were determined for each subject, but during therapy sessions, all were put at the 'painful' level of shock, as all of them showed withdrawal movement of the hand, at this level, evidencing the avoidance criterion.

Results and Discussion

The obtained results have been treated individually, as the group-wise treatment of results would dissolve the individual tendencies of each case.

Graphs have been drawn for each subject representing the cumulated frequency of responses against time in successive minutes. Curves for Stuttering rates, during progress of therapy have been drawn for 5th, 10th, 15th etc., sessions (at intervals of 5 sessions) to make room for appearance of perceivable changes. A comparison of differences between base rate curves for each case might be taken to represent the effect of shock on stuttering rate.

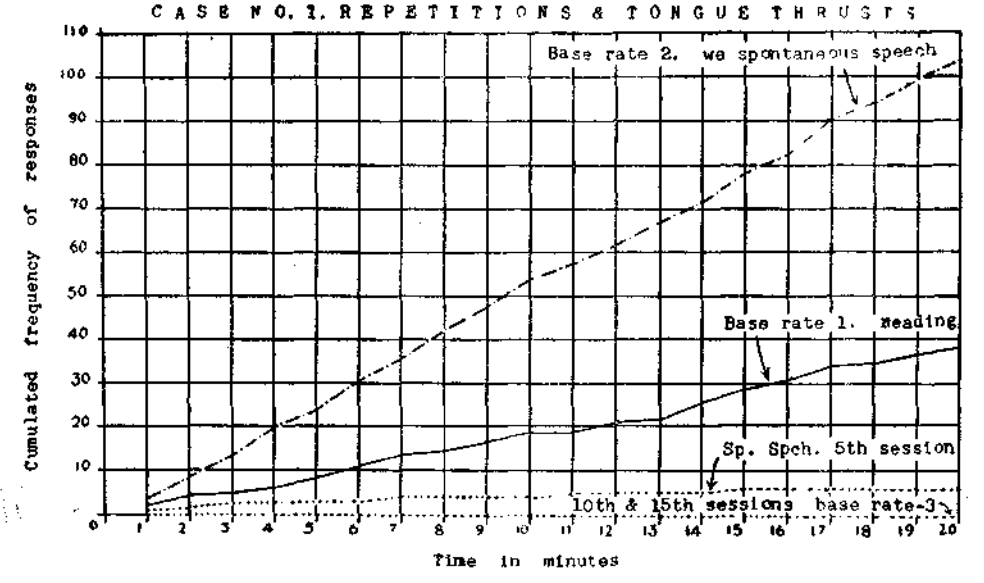
Case 1

Case 1 is 20 years of age, a student in II B.Com. Onset of stuttering at the age of 2. Father is a stutterer. He was diagnosed as a case of severe stuttering. EPI scores were N=19, E=6, L= 6. High trends of neuroticism and definite leanings towards introversion. Obtained an IQ of 113 on the short form of Bhatia's battery.

Repetition of sounds and syllables and tongue thrusts were most prominent responses, and were selected for contingent shock stimulation.

Reported shock as 'just detectable' at 10 volts, 'painful' at 20 volts and 'most painful' at 40 volts. Shocks were administered at 20 volts all through.

Graph 1 indicates results.



The curve for base rate 2 portrays increased stuttering rate as this was obtained on spontaneous speech. This is attributed by the patient to an on the spot translation of a story from Hindi to English which he felt difficult.

A perceivable decrease in responses occurred in 5th session and no responses were observed on 10th session, 15th session.

The base rate 3 on 20th session was 0 all through. This is a case where a total elimination of stuttering was achieved in the laboratory.

Pretherapy composite quantitative estimate was 56 and post therapy estimate was 23.

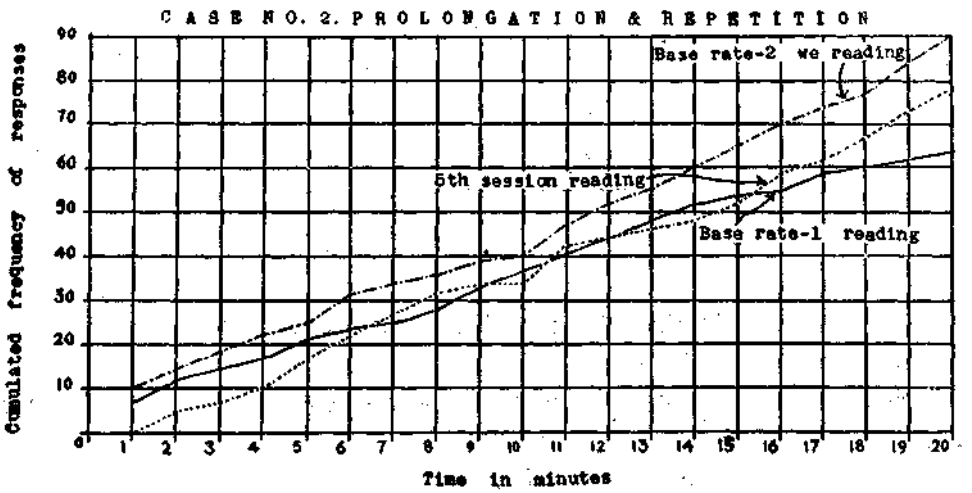
Case 2

Aged 20 years, studying in B.Sc. Final. Onset of stuttering at 6 years. Grandfather was a stutterer. Diagnosed as a case of severe stuttering. Obtained an IQ of 115 on short form of Ehatia's Battery. EPI results showed significant neurotic trends and definite leanings towards introversion. (N=15, E=6 and L=4).

Repetitions and prolongations were the most frequent observed responses and were chosen for contingent shock stimulation.

He just detected shock at 10 volts, felt painful at 20 volts and most painful at 40 volts. Therapeutic sessions were conducted at 20 volts.

Graph 2 indicates findings.



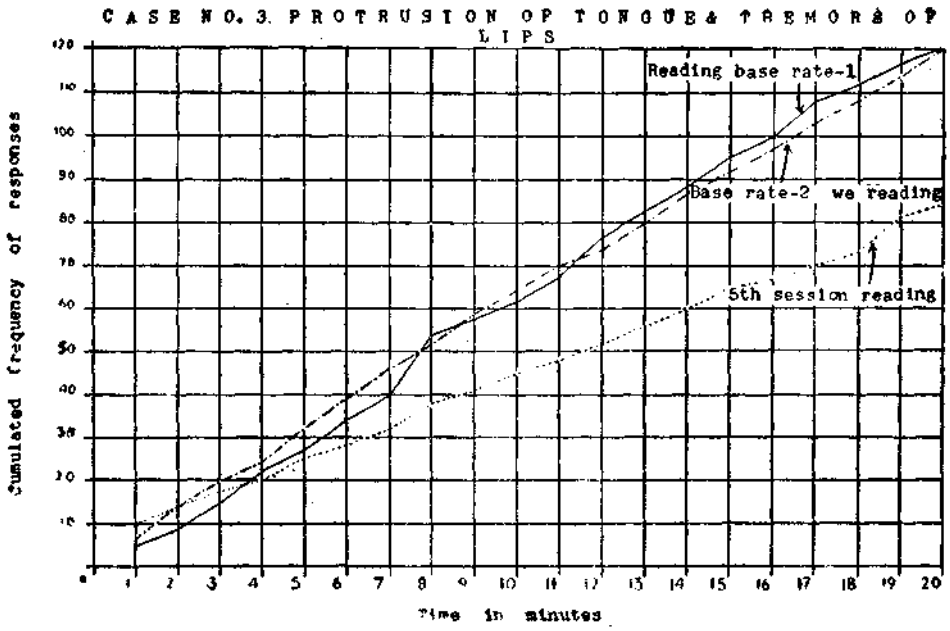
Results of 5th session do not show a consistent pattern. The case left off treatment in the middle without assigning any reason.

Case 3

Aged 21 years, studied upto P.U.C. Onset'of stuttering at 11 years. Duration of stuttering is over 10 years. Maternal uncle and maternal aunt were stutterers. Obtained an IQ of 122 on Bhatia's short form. EPI record suggests high degree of neuroticism with no definite leanings towards extroversion or introversion (N=19, E=13 and L=5).

He was diagnosed as a case of moderate stuttering, with predominant secondary characteristics like protrusion of tongue and tremors of the lips which were chosen for contingent shock stimulation.

Results are given in graph 3,



Base rate 1 and 2 show almost no differences. Stuttering rate in 5th session shows a definite decrease.

Pre-therapy composite quantitative estimate was 44 and present estimate is 32.

He is still continuing treatment.

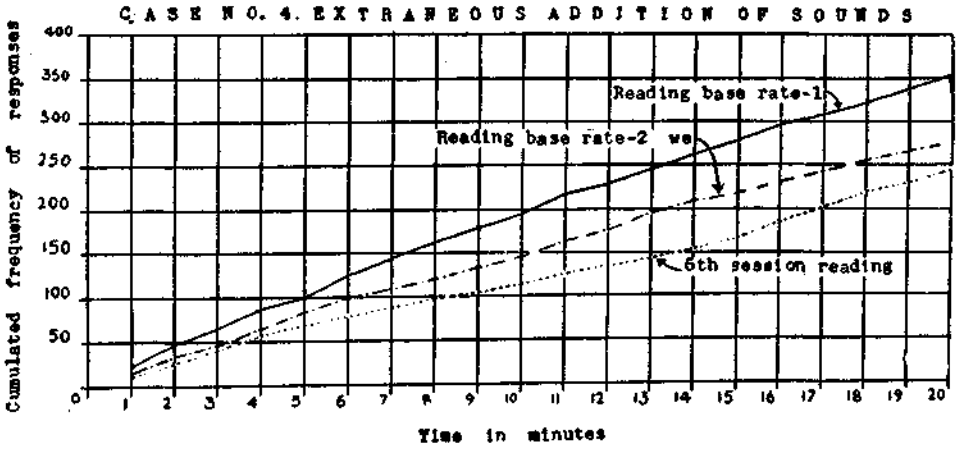
Case 4

Aged 21 years, studying in B.E. Onset of stuttering since 8 years of age. Duration of stuttering is about 13 years.

Father is a stutterer. EPI results are not significant on both the dimensions of neuroticism and extraversion. He was diagnosed as a moderate stutterer.

An observation of speech showed extraneous addition of sounds, eye closure, and repetitions. But as extraneous addition of sounds was most frequent, this was selected for contingent shock stimulation.

Results are given in graph 4.

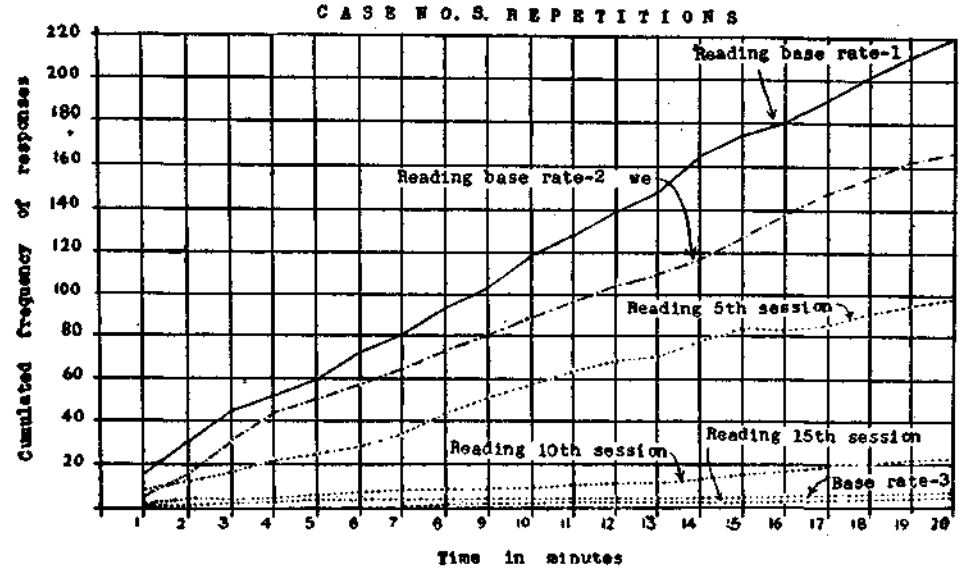


Stuttering rate decreased in 5th session as compared to Base rates.

The case was discharged at his request as he could not attend therapy in order to attend college elsewhere.

Case 5

Aged 22 years, studying B.Com. Onset of stuttering at the age of 3 years and has continued over a period of 19 years. Severity of stuttering has increased over this period. He was diagnosed as a case of moderate stuttering with secondary symptoms. EPI scores were N=10, E=10 and L=4. No signi-



ficant trends of neuroticism with no definite leanings towards extraversion or introversion. It was a reliable record. There was no family history of stuttering. Obtained an IQ of 93 on the short form of Bhatia.

The most predominant feature of stuttering was Repetitions of initial sounds and therefore this was chosen for contingent shock stimulation.

Graph 5 indicates the results.

Results portray a consistent decrease in stuttering over the sessions almost amounting to elimination of stuttering.

Pre-therapy estimate was 51 and post-therapy estimate was 27.

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