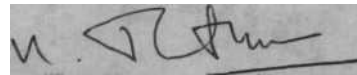


This work is dedicated to the person from whom
I learnt all that I know about Speech Pathology

N.P.Nataraja

C E R T I F I C A T E

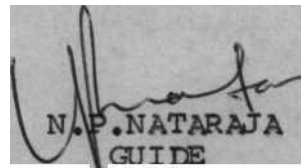
This is to certify that this dissertation entitled "Effects of highlighting of fluency and dysfluency in stutterers" is the bonafide work in part fulfilment for M.Sc., Speech and Hearing of the student with the Register No.7



Dr. N. Rathna,
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C E R T I F I C A T E

This is to certify that this dissertation entitled "Effects of highlighting fluency and dysfluency in stutterers" has been prepared under my supervision and guidance.



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D E C L A R A T I O N

This dissertation is the result of my own work undertaken under the guidance of Mr. N.P.Nataraja, Head of the Department of Speech Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any university for any other diploma or degree.

REG.No.7

Mysore

Date:

A C K N O W L E D G E M E N T

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INVESTIGATOR

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CHAPTER - I

INTRODUCTION

Many authors have explained stuttering learning theories are getting more weightage in the field of stuttering closely following their success in behaviour modification.

Flanagan, Goldiamond and Azrin (1958) first described that speech fluency can be brought under operant control* This aroused the interest in the application of the Skinnerian behavioural principles for the modification of dysfluencies.

In Skinner's system of behavioural analysis a central role is played by the kind of response termed as operant that is capable of being increased or decreased through its consequences as they affect the organism. Skinner stresses that the contingent consequences determine whether the omitted response is to be maintained or extinguished.

The application of these operant principles in the explanation and remediation of stuttering has been mainly in 2 ways (1) punishment or use of aversive contingencies for the unwanted dysfluencies (2) reinforcement or use of positive, non-aversive contingencies with the fluency. Some authors have also used both punishment for dysfluency and reinforcement for fluency together (Martin and Seigel, 1966).

In another experiment Martin and Seigel (1968) remarked that it is the highlighting phenomena that brings about a reduction in stuttering. According to them any stimulus which highlights the dysfluencies causes them to decrease. They explain this by stating that dysfluencies of normal adult speakers are potential carriers of their own punishment, such that increase in subjects' attention to it evokes a punishing property.

An attempt was made by Vijayalaxmi (1973) to find out the effects of 3 verbal stimuli good, no zehu on stutterer's dysfluency, and she concluded that all of them acted as highlights and showed no differential effect on stuttering.

Basalingappa (1980) experimented with time out and put forth a similar explanation as ... "probably it is the highlighting phenomena that causes a reduction in dysfluency". Further research by Seigel and Martin (1968), Manning et al (1974) Adams and Propelka (1971). James and Ingham (1974), Castello (1975) yeild similar findings.

Srinivas (1981) studied the effect of highlighting the fluency and fond a decrease in dysfluency. However, he did not verify the effect of highlighting of dysfluency.

According to Hegde (1978) the programs, while aiming at dysfluency modification somehow become oriented in a direction of making the dysfluent behaviour as the therapeutic goal.

This point he further explains by stating that the fluency therapy and stuttering therapy though aim at no different therapeutic goals but have a complete procedural distinction. Enhancing fluency seems much easier and reasonable than dysfluency modification.

Thus the review of literature indicates that the fluency can be increased by highlighting fluency. Therefore the present study was planned to study the effect of highlighting fluency and dysfluency separately in stutterers.

Need for the study:

The knowledge of the effect of highlighting fluency or dysfluency will be useful in developing simpler and economical, therapy techniques for stutterers.

Further they may also help in understanding the etiology, development and maintenance of stuttering.

Statement of the problem

The present study attempted to find out the effect of

highlighting fluency and dysfluency on number of blocks and syllable output in reading and syllable output.

Methodology

Six stutterers were used as subjects for this study. All the subjects underwent 3 experimental conditions in experiment-1 the subjects read a Book for fifteen minutes and spoke on a topic of their own interest for fifteen minutes. 3 such sessions were conducted.

In experiment-2 the subject read a passage from a book for 10 minutes. In next 10 minutes the subject read a passage from the same book. During this session of experiment-2 either dysfluency (each block) or fluency for 5 sec. were highlighted by the experimenter by uttering the word look (or nodi) as pre-determined.

Each subject underwent experiment-2, 5 times.

The experiment-3 was similar to experiment-1 in all respect

All the speech samples were recorded and analysed with the help of 2 judges to obtain the number of blocks and the syllable output in each session of the 3 parts of the experiment for all the subjects.

Purpose of the study:

The purpose was to test the following hypotheses:

- 1-a (I) Highlighting of fluency has no effect on the number of blocks in reading.
- 1-a(II) Highlighting of fluency has no effect on the number of blocks in spontaneous speech.
- 1-b(I) Highlighting fluency has no effect on the syllable output in reading.
- 1-b (II) Highlighting of fluency has no effect on the syllable output in spontaneous speech.
- 2-a (I) Highlighting dysfluency has no effect on the number of blocks in reading.
- 2-a (II) Highlighting dysfluency has no effect on the number of blocks in spontaneous speech.
- 2-b (I) Highlighting dysfluency has no effect on the syllable output in reading.
- 2-b (II) Highlighting dysfluency has no effect on the syllable output in spontaneous speech.

Implications

The proper understanding of the highlighting phenomenon can help the clinician to implement it as a therapeutic tool to help the stutterer.

Limitations

- 1) Only six subjects have been taken
- 2) The marking and the utterance look (or nodi) have not been separated.
- 3) The severity of stuttering was not considered as a variable.
- 4) Only primary behaviour of stuttering was considered.
- 5) Language has not been considered as a variable.
- 6) The number of highlighting sessions have been only 5 and the duration of each session was only 10 minute*.
- 7) The experiment-1 and 3 have been of only 3 sessions.

Definitions

1. Stuttering: "The term stuttering means I.(a) dysruption in the fluency of verbal expression which is (b) characterised by involuntary audible or silent repetitions or prolongations in the utterance of short speech elements namely sounds, syllables and words. These dysruptions (c) usually occur frequently

or are marked in character and (d) are not readily controllable,

II - sometimes the dysrruptions are (a) accompanied by accessory activities involving the speech apparatus related or unrelated body structures or stereo-typed speech utterances. These activities give the appearance of being speech related struggle.

III - Also there are not infrequently (f) indications or reports of the presence of an emotional state ranging from a general condition of excitement or tension to more specific emotions of a negative nature such as fear, embarrassment, irritation or the like (g) the immediate source of stuttering is some incoordination expressed in the peripheral speech mechanism, the ultimate cause is presently unknown and may be complex or compound.

The word "block" has been used for those stuttering described in part-I in the above definition.

2 - Fluency is defined as the ongoing speech devoid of all forms of dysfluencies.

3- Highlighting is to make the subject aware of the particular behaviour.

CHAPTER-II

REVIEW OF LITERATURE

Many good minds have struggled to understand the problem of stuttering but all from different tangle because of their orientation and were probably too dogmatic which resulted in a clouding of porplexing ideas and theories. Array of theories from the time of Hippocrates have poured in, to explain the problem. But even now the very definition of the problem is not a well formulated one.

The available definitions have been grouped into 5 categories by Hegde (1978). They are (1) Perceptual judgemental definitions (2) Experimental theoretical definitions (3) definitions based on avoidance behaviour (4) definitions based on molar moment of stuttering (5) definitions based on hypothetical variables.

Perceptual - judgemental definitions are based on the fact that listeners differently react to the different forms of disfluencies.

Van Riper's (1971) and Wingate's (1964) are the types of definitions which fall into this category where they have

considered speech sound prolongation and part word repetitions but have neglected the variables such as tension, avoidance.

The experimental theoretical definitions as that of Brutton (1975) propagates the view that suggest different control for different forms of dysfluencies. Brutton (1975) has found the punishments to be ineffective in controlling part word repetitions and speech sound prolongations but can control the other forms of dysfluencies.

Johnson's (1967) definition falls into the third category.

The moment of stuttering has been the basis for many researchers, for defining it. Moment refers to the time of occurrence of the molar behaviour. Hegde (1978) however rejects; this form of definitions as not useful.

The final category talks about hypothetical variables. Sheehan's (1970) definition that stuttering is a disorder of the social presentation of the self is one among the definitions falling in this category.

However, the most accepted definition of stuttering has been that of Wingate (1964) and for the purpose of the present study this has been accepted as the definition of stuttering.

Wingate (1964)'s definition:-

The term stuttering means I(a) disruption in the fluency of verbal expression which is (b) characterised by involuntary, audible or silent, repetitions or prolongations in the utterance of short speech elements namely: sounds, syllables and words of one syllable. These disruptions (c) usually occur frequently or are marked in character and (d) are not readily controllable II sometimes the disruptions are (e) accompanied by accessory activities involving the speech apparatus related or unrelated body structure or stereotyped speech utterances. These activities give the appearance of being speech related struggle III. Also, there are not infrequently (f) indications or reports of the presence of an emotional state, ranging from a general condition of excitement or tension to more specific emotion of a negative nature such as fear, embarrassment, irritation or the like (g) The immediate source of stuttering is some in-coordination expressed in the peripheral speech mechanism; the ultimate cause is presently unknown and may be complex or compound. This definition being used is for the present discussion.

As far the explanation of stuttering in terms of learning goes, it can be traced back to eighteenth century. Amman(1700)

described stuttering as a bad habit and called it hesitancy. Erasmus Darwin (1800) suggested that stuttering was due to emotionally conditioned interruptions of motoric speech. Madame Leigh (1825) believed that stuttering was due to abnormal tongue thrust habit and trained her patients to speak with a cotton pad under the tongue. Bell (1853) wrote several books suggesting stuttering as learned behaviour. According to him as speech is learnt so must be its defects. Many others considered stuttering as a learned behaviour and started treating it with different exercises, modification of manner of speaking, breath control etc. Some of which even now are employed to great & nucleus of stutter face speech which later can be reinforced Mendelsohn (1929) attributed the disorder to conflict between ideas and emotions. Dunlap (1932) tried to correct stuttering using a method called 'negative practice'.

Bluemel (1935) discarding the earlier organic theory of stuttering outlined a learning theory based on pavlovian conditioned inhibition. Bluemel distinguished primary stuttering which was the result of conditioned inhibition and secondary stuttering which also included many habituated strategies for

coping with the interruptions Froeschel (1943, 1955, 1964) described stuttering as developed out of normal childhood dysfluency through a learning process and opposed the organicists and the psychoanalysts views about stuttering.

There are many different learning theories. These have been used to understand stuttering. The main approaches are classical conditioning, operant conditioning and combinations of these two.

Strong emotions with expectation of punishment might disintegrate the formulation of a message as well as it might affect the verbal expression of the thoughts. Brutten and Shoemaker (1967) state ----"We have taken the position that stuttering is that form of fluency failure which results from conditioned negative emotions". Further they write that - "the disintegration created by negative emotions is fundamental to any discussion of that specific form of fluency failure termed stuttering. In this light stuttering is not an instrumental response that depend on reinforcement for acquisition or maintenance but as a fluency failure caused by the cognitive and motoric disorganization associated with negative emotion. Whatever else may be involved in stuttering, the speaker is engaged in the performance of a motor act that requires fine coordination.

and this performance is disrupted. This disorganization is seen as part of the generalised autonomic response complex which in essence defines negative emotions.

This learning to respond with negative emotion to stimuli takes place through classical conditioning. In essence, then it is hypothesized that when an individual stutters he is expressing learned negative emotions (autonomic activity) which is disrupting his normally fluent speech behaviour".

The classical conditioning theorists hold the opinion that the original fluency breaks consist of disorganized form of previously integrated behaviour* They consider the antecedents of stuttering as important as the consequences. Some, produce emotional upheaval which in turn disrupt speech. When neutral stimuli get paired with these stimuli that produced emotional upheaval they two acquire the same value.

According to the operant conditioning theories any behaviour desirable or undesirable can be shaped or modified by their consequences i.e. A behaviour gets modified depending upon the reinforcement and its contingency with the behaviour.

Stuttering according to the operant conditioning theories is based on the reinforcement of normal nonfluencies. The advocates

of operant conditioning are Flanagan, Goldiamond and Azrin(1958), who claimed that stuttering can be controlled through operant conditioning. They consider stuttering as a unit of verbal behaviour i.e. pauses repetitions and other nonfluencies can be considered operant responses which are followed by consequences uncommon to normal speech for example attention, non interruption on the part of the listener and the like.

Shames and Sherrick (1963) included "the normal nonfluency leading to stuttering" hypothesis and published a theoretical paper on the genesis of stuttering. According to which:-

- A continuity exists between stuttering and nonfluency.
- Stuttering is maintained by positive and negative reinforcements on complex - multiple schedules.

They have included the following as variables in stuttering behaviour:-

1. Listener's attending behaviour
2. Coincidental reinforcement of other behaviour
3. States of deprivation
4. Avoidance of aversive stimuli
5. Self editing and self correcting behaviour.

The reasons for the persistence of stuttering behaviour inspite of contingent negative reinforcement and/or punishment has bewildered

researchers. The operant theorists believe that most of the secondaries in stutterers are operantly conditioned responses. By emitting a particular secondary behaviour for example eye blink or head jerk the stutterer can avoid the punishments momentarily and thereby the secondaries get reinforced. It is believed that human behaviours can be maintained by punishments if the punisher can be given conditioned reinforcing properties. Every time a particular behaviour is performed to avoid punishment that behaviour will be maintained.

Brutten and Shoemaker (1967) applied the 2 factor theory of Mowrer (1950) to explain stuttering. According to them the core behaviour of repetitions and prolongation are due to classically conditioned negative emotions. And the various coping methods the stutterer turns to meet with the threat of broken speech are instrumental responses which have been conditioned through their reinforcing consequences. First the conditioned negative emotion disrupts the normal speech and this leads to escape or avoidance behaviours.

Wischener (1947) using the Hullian concepts put forth his anticipatory theory of stuttering. He adopted the concepts of Johnson that stuttering begins when the child begins to

react to the parental disapproval or other penalties with tension, anxiety and avoidance. However, Wischener differs from Johnson as he states that the child does not try to avoid the punishments but the consequences of his stuttering i.e. the feelings of anxiety, hurt and shame and the stutterer adopts several methods of avoidance. Each of it being used again. But these anticipatory struggle and avoidance behaviour are themselves being punished by the listener. The reason that they persist is that the punishment occurs after the anxiety reduction.

Sheeham (1958) adopted Dollard and Miller's approach avoidance conflict theory to explain stuttering. The conflicts are unpleasant emotional states which are characterised by the oscillation or fixation in a state of tension when the 2 opposing forces are equal.

The stutterers are caught in a double approach avoidance conflict when they have an urge to speak and avoid the shame and guilt got from stuttering or keep quiet and suffer the frustration of this retreat.

This conflict according to Sheeham (1958) is maintained at various levels (1) the word level (2) situation level (3) level of emotional expression (4) ego protective.

Sheehan (1958) proposes 2 hypothesis (1) the conflict hypothesis - that the stutterer blocks whenever the conflicting approach - avoidance tendencies reach a precautions equilibrium.

The fear reduction hypothesis - the stuttering itself reduces the fear of stuttering to permit release from the blocked word - thus resolving the conflict momentarily.

However, Van Riper (1971) states that "No learning theory yet seem to account for all the facts about learning, so we should not be surprised to find different explanations for how stuttering is learned, shaped and maintained".

In spite of the fact that none of the explanations based on learning theories explain all the factors related to stuttering, attempts have been made to control or modify stuttering by therapies based on the principles of learning theories.

In order to validate the concept that stuttering is equivalent to normal dysfluencies some researches have punished the normal dysfluencies in normal speakers. Saroye (1961) found shocks increased the dysfluencies. Stassi (1961) reported that

normal speakers became more dysfluent under contingent punishment of dysfluencies with the word wrong than they did when the word right was used. Seigel and Martin (1965a) found that random shock increased the dysfluencies. Eveslage (1969) presented noise and "number" when the normal speakers were dysfluent. He found the noise increased the dysfluencies and "Number" decreased them. Seigel and Martin (1968) found a decrease in dysfluencies and slowing of rate when verbal punishments were used with the dysfluencies. They said that probably the speakers became more careful about how they talk.

In adults it does seem to be true that stuttering is related to the antecedent stimuli. Johnson and Sinn (1937) found that 98% of stuttering can be eliminated by having the stutterer omit the previously stuttered words. Johnson and Knott (1937) found that when the stutterers reread a passage after an interval of time 72% of the stuttering were on the same words. Berwick (1955) found that the stutterers had less stuttering with the photographs of those considered to be difficult to speak to than with those people considered as easy listeners.

Stutterers can anticipate most of stuttering which is probably on the basis of the conditions proceeding the stuttering, yet stuttering can occur without the stutterer expecting it.

Van Riper (1937) first subjected the stutterers to shock treatment. The electric shock supposed to decrease stuttering instead increased their frequency. Frick (1951) found number decrease in stuttering when punished. Frederick (1955) found increase in stuttering with contingent shock. Webster (1968) found decrease in voluntary stuttering with punishment. Cherry and Sayers (1955); Shame (1955); Flanagan, Goldiamond and Azrin (1958) used loud noise, Martin and Seigel (1966); Quist and Martin (1967); Curlee and Perkins (1967); Viswanath (1972) used stuttering contingent shocks Nessel(1958); Solderburgh (1959); Adamczyk (1959); N lay (1961); Chase, Sutton and Rappin (1961); Logue (1962); Goldiamond (1965); Gross and Nothanson (1967); used D.A.F., Horelson, Martin and Starr (1968); Halvorson (1971); verbal punishments were used by Martin and Seigel (1966).

A series of studies conducted at Minnesota Laboratory by Martin, Seigel and their associates showed that the stuttering response specified in terms of molar or molecular components decrease in frequency when punished.

Dattatreya (1973) used 3 schedules of reinforcement on stuttering and concluded that:

- (1) Continuous contingent and random contingent negative stimulation decreased stuttering.
- (2) Random negative stimulation did alter stuttering significantly.
- (3) There were no significant differences between the effects of continuous contingent and random contingent negative stimulation.

The operant methodology is not restricted to punishment alone as the stutterers speech is not restricted to dysfluency alone. The fluency period of speech has been rewarded so as to strengthen this behaviour bringing about a concomittant decrease in stuttering.

Leach (1969) while stressing the use of fluency reinforcement emphasised that as dysfluency and fluency are incompatible they can not exist together. Reinforcing fluency in a counter-conditioning schedule should reduce stuttering.

Martin and Seigel (1966) used the verbal stimulus good for every 30 seconds of fluency with 2 adult stutterer. How-

ever, the subjects also received a "not good" with every stuttering block the study showed decrease in dysfluency.

Shaw and Shrum (1972) reported decrease in dysfluency in 3 stuttering children by reinforcing fluency. They tabulated the correct responses as reinforcers.

Manning et al (1976) based on their study reported that tangible and verbal reinforcers equally decreased stuttering.

Hegde and Brutten (1977) found an increase in fluency for all the subjects when fluency was reinforced. Hegde believes that if the results of the kind obtained in his study are extended and replicated, clinically useful procedures for fluency manipulation can be established.

Several authors came across a peculiar phenomenon the supposedly aversive and non-aversive stimuli yielded similar results. Cooper, Cady and Robbin (1970) found the words wrong, right and tree reduced stuttering equally. Vijayalaxmi (1973) found similar results for the 3 words "good", "No" & "Zehu". She studied their effect on fluency in eight stutterers following a 100% contingent reinforcement schedule. The verbal stimulus was presented contingent on a fixed duration of fluency. This duration differed from subject to subject but was kept same for

a subject throughout the experiment. Five stutterers showed decrease in stuttering for all the 3 stimuli.

However, she concluded that highlighting can be used to reduce stuttering.

The results of different studies which have used contingent stimulation to reduce stuttering show that the stimulus need not be aversive to bring about reduction in stuttering (Cooper et al 1970; Vijayalaxmi, 1973).

Wingate (1959) found that the contingent registration of a point on a counter was sufficient to produce reduction of stuttering. Similarly Cooper et al (1970) found that words such as "right", and "true" were as effective as "wrong" in contingently punishing the dysfluencies of stutterers. Seigel and Martin (1966) found a similar result when a neutral buzzer reduced stuttering.

Wingate (1959) explained that any stimulus which draws subject's attention reduces stuttering. Martin and Seigel (1968) putforth a similar but more elaborate hypothesis. They reasoned that the dysfluencies may be behaviours that carry their own

punishment and that any stimulus which serves to highlight or alert the speaker to those behaviours will result in response reduction.

Based on this hypothesis Vijayalaxmi (1973) explained her findings. The decrease of stuttering was due to highlighting and persistence of stuttering was due to insufficient highlighting, was the explanation. Basalingappa (1980) also concluded that time out more acted as highlighter than punisher. Further weightage was to this hypothesis was applied by Srinivas (1982), who directly studied the effect of highlighting of the fluency in 5 male stutterers. The stimulus word was "nodi" meaning "to look". The highlighting stimulus nodi was presented along with a striation on the paper. This served to highlight the fluency while the subjects read a book. His conclusions are:-

" (1) After the sampled highlighting of fluency there will be decrease in the number of dysfluencies in stutterers.

(2) After the sampled highlighting of fluency there will be increase in number of syllable output in stutterers.

He studied the highlighting of fluency and its effects on dysfluencies in stutterers. Thus the review of literature shows that highlighting can be used to modify the behaviour of

stutterers. Therefore it was considered that it will be interesting to note the effect of highlighting on fluency and dysfluency in stutterers in different situations. The present study aims at a comparative evaluation of the highlighting fluency and highlighting dysfluencies in stutterers to find out its clinical utility and to adopt this as a mode of treatment which can be either dysfluency modification or fluency enhancement.

CHAPTER-HI

METHODOLOGY

The present investigation was carried out to study the effects of highlighting of fluency and disfluency separately, in stutters.

Subjects:

--Six male subjects were considered for the study who had been diagnosed as stutters by speech pathologists at All India Institute of Speech and Hearing. These subjects had no other speech or hearing problems. None of them had undergone any treatment previously (Details of each case given in appendix-1). The language used was either English or Kannada.

Material:

The stimulus material used in this study were (1) A Kannada book on printing technology for all the three Kannada speaking subjects.

(2) An English novel for the 2 English speaking subject.

The experiment was conducted in a quiet room.

The experiment was divided into 3 parts mainly:

The experiment - Part-I

The subject was seated comfortably in a chair with the experimenter sitting across the table. The subject was given the following instructions.

"I will give you a book and show you a chapter. When I say start, you please start reading the passage until I ask you to stop".

The subject read the passages for 15 minutes in each of the sessions, which was recorded using a Phillips tape recorder and Sony C-90 cassettes.

Caution was exercised to see that the subjects did not repeat the passages read earlier.

After the reading was over the subject was asked to speak on some topic of his own interest. The subject was informed that he will have to speak for fifteen minutes continuously.

The spontaneous speech too was recorded.

Thus, each session consisted of reading of 15 minutes and spontaneous speech of fifteen minutes. 3 such sessions with an interval of 24 hours between 2 successive sessions were considered to determine the base rate.

All the subjects underwent the experiment - Part-1.

Base rate:

The number of blocks in the 3 sessions as judged by 2 post graduate students in Speech and Hearing who served as judges were averaged to get the base rate.

The syllables uttered during the reading and spontaneous speech served as the rate of syllable output for each subject.

Thus the base rate and syllable output for each subject were determined.

Experiment - Part-2.

The second part of the experiment consisted of sessions with 3 segments.

- (A) Assessing the number of blocks and syllable output before the introduction of highlighting stimulus by reading a passage for a duration of 10 minutes.
- (B) Highlighting the behaviour i.e., fluency or dysfluency, while reading, for a duration of 10 minutes.

The behaviour to be highlighted was determined by the experimenter before the experiment i.e., whether the subject receives highlighting of fluency or dysfluency.

It was decided to highlighten the fluency and dysfluency in alternate

(A) Assessing the number of blocks and syllable output without the highlighting stimulus in reading.

These experimental sessions were also conducted in the same room as in the experiment-1.

Experiment - Part-2A

The subject was given the following instructions by the experimenter!

"I am going to give you a book and will show you a chapter when I say start,you please start reading as you normally do until I ask you to stop".

Then the subject was given the book with a particular chapter to read. The subject read the chapter for 10 minutes. This was recorded using the instrumental set up as in experiment Part-1.

The behaviour to be highlighted was determined by the experimenter before the experiment i.e., whether the subject receives highlighting of fluency or dysfluency.

It was decided to highlighten the fluency and dysfluency in alternate cases.

(A) Assessing the number of blocks and syllable output without the highlighting stimulus in reading.

These experimental sessions were also conducted in the same room as in the experiment-!.

Experiment - Part-2A

The subject waa given the following instructions by the experimenter:

"I am going to give you a book and will show you a chapter when I say start. you please start reading as you normally do until I ask you to stop".

Then the subject was given the book with a particular chapter to read. The subject read the chapter for 10 minutes. This was recorded using the instrumental set up as in experiment Part-1.

Experiment Part-2B

, After ten minutes of reading (experiment - Part-2A) the subject was given the following instruction by the experimenter, depending upon the condition for which he was receiving highlighting.

(a) For the subjects who received highlighting of dysfluency:-

" I am going to show you a chapter in this book when I say start you please start reading. As you read I will say look (or nodi) whenever you stutter. You need not stop reading as I say look, this only to make you aware of your stuttering".

(b) For those who received highlighting of fluency:"I am going to show you a chapter in this book, when I say start,you please start reading as you do normally. If you read well without any stuttering I will tell you look (or nodi) to inform you that you have read well for 5 seconds. If you stutter before a period of 5 second is over I will not say look. But you need not stop reading or look up when I say look".

After necessary instruction each subject was given the book for reading, meanwhile the experimenter performed the following task.-

(a) For the subjects whose dysfluencies were highlighted:

Whenever the dysfluencies occurred the experimenter uttered the word look for nodi. Thus highlighting the occurrence of the blocks.

Simultaneously he also noted down the number of times the highlighting stimulus was presented on a sheet of paper. This session was for a period of 10 minutes.

The reading was recorded as in experiment Part-1.

(b) For those subjects whose fluency was highlighted:

Whenever the subject was fluent for 5 seconds continuously the experimenter presented the highlighting stimulus "look" (or nodi). The period of 5 seconds was noted by using a watch by the experimenter.

Simultaneously, the experimenter noted down the number of times the highlighting stimulus was presented.

This session was for 10 minutes. And the reading was recorded using the same set up as in the experiment Part-1. Thus the experiment Part-2B was conducted.

Experimental Session 2-A:

After the experiment Part-2B, 2-A was conducted. In this session the instruction and procedures used were same as in 2-A.

This was also for a period of 10 minutes and the recording of the reading was also done, as described in experiment Part-1.

Thus each subject underwent experiment Part-2A, 2-B and 2-A, each of them being for a period of ten minutes with either fluency or dysfluency getting highlighted.

All the 6 subjects underwent experiment Part-2 five times with an interval of 24 hours between 2 successive experimental sessions either getting fluency highlighted (subject 1,3 and 5) or dysfluency being highlighted (subject 2,4 & 6) in experiment part-2B.

Subject No.6:

The subject No.6 however was made to speak spontaneously on topics of his own interest throughout the experiment part-2 as he showed very few stuttering during reading. Therefore

instead of highlighting dysfluency in reading dysfluency in spontaneous speech was highlighted. Except for this change no other modification was made in the experiment.

Experiment Part-3:

The instructions and the procedures used in this part of the experiment was same as in the part-1 i.e. the subject was asked to read a passage from the book for a period of 15 minutes and to speak on a topic of his choice for a period of 15 minutes.

Both speaking and reading were recorded.

All the six subjects underwent this experiment.

	*Experiment Part-1		* Experiment Part-2			* Experiment Part-3	
	spontaneous speech	Reading	A	B	C	Spontaneous speech	Reading
Number of sessions	3	3	5	5	5	3	3
Duration	15 min.	15 min.	10min.	10min.	10min.	15min.	15 min
Presence of highlighting stimulus	--		-	+		-	--

Analysis of the data:

All the recorded speech samples (spontaneous speech and reading) were analysed by 2 post graduate students in Speech and Hearing to determine number of blocks. The samples were transcribed to determine the syllable output.

To find the significance of difference in terms of number of blocks and syllable output between experiment Part-1 and experiment-3, the data were analysed using Wilcoxon's matched pairs signed rank test. The following comparison was made to find out the effect of highlighting of fluency and dysfluency.

1. Experiment Part-1 Vs Experiment Part-3
2. 2-A Vs 2-B
3. 2-B Vs 2-A
4. 2-A Vs 2-A

CHAPTER - IV

RESULTS AND DISCUSSION

In the present study 3 subjects received highlighting fluency in reading, 2 subjects received highlighting of dysfluency in reading. Additionally one subject received highlighting of dysfluency in spontaneous speech. The effect of the treatment have been analysed for the number of blocks in spontaneous speech and in reading? and the syllable output both for spontaneous speech and reading immediately before and after highlighting and 24 hours and beyond after highlighting.

Table-1 and Table-2 show the mean number of blocks and mean syllable output respectively, for each subject in experiment part-1, 2 and 3. The tables 3 and 4 show the significance of the test data shown in the tables 1 and 2 and the Tables A,B, C,D,E and F. The graphs 1-a, 1-b, 2-a, 2-b, 3-a, 3-b, 4-a, 4-b, 5-a, 5-b, 6-a and 6-b show the number of blocks and syllable output in subjects, 1,2,3,4,5 and 6 respectively.

Subject-1 received highlighting of fluency in reading. Table-1 and 2 show the means number of blocks and mean the syllable output per minute in experiment Part-1, Experiment Part-2, experiment-3.

TABLE-1 Showing mean number of stuttering blocks per minute in each part of the experiment for all the subject.

Subject	Condition	Experiment part-1		Experiment part-2			Experiment Part - 2	
		spontane- our speech	Reading	A	B	C	Spontane- our speech	Reading
1	Highlighting fluency in reading	5.6	5.9	4.22	2.54	4.16	7.0	2.6
3	Highlighting fluency in reading	5.1	4.0	3.2	2.54	3.5	4.9	4.3
5	Highlighting fluency in reading	6.4	6.3	3.24	2.62	4.08	6.1	4.2
2	Highlighting Dys- fluency in reading	6.3	2.9	4.8	4.8	4.56	9.3	3.1
4	Highlighting dys- fluency in reading	2.8	7.7	1.8	1.22	1.58	2.2	5.6
6	Highlighting dys- fluency in sponta- neous speech	5.4	3.2	7.26	4.62	5.5	4.5	2.2

TABLE-2 showing mean number of syllable output in each part of the experiment for all the subjects

Subject condition	Experiment part-1		Experiment part -2			Experiment part-3	
	Spontaneous speech	Reading	A	B	A'	Spontaneous speech	Reading
1 Highlighting fluency in reading	125.5	212.1	238.62	239.16	240.6	142.7	257.3
3 Highlighting fluency in reading	97.5	147.2	236.36	250.64	238.24	114.4	264.7
5 Highlighting fluency in reading	112.3	168.6	225.24	244.4	244.82	123.7	262.9
2 Highlighting dys-fluency in reading	66.5	137.0	150.64	148.06	151.14	74.2	159.4
4 Highlighting dys-fluency in reading	136.8	274.5	294.76	286.7	289.5	143.4	321.6
6 Highlighting dys-fluency in spontaneous speech	145.5	207.8	122	139.26	145	175.5	221.6

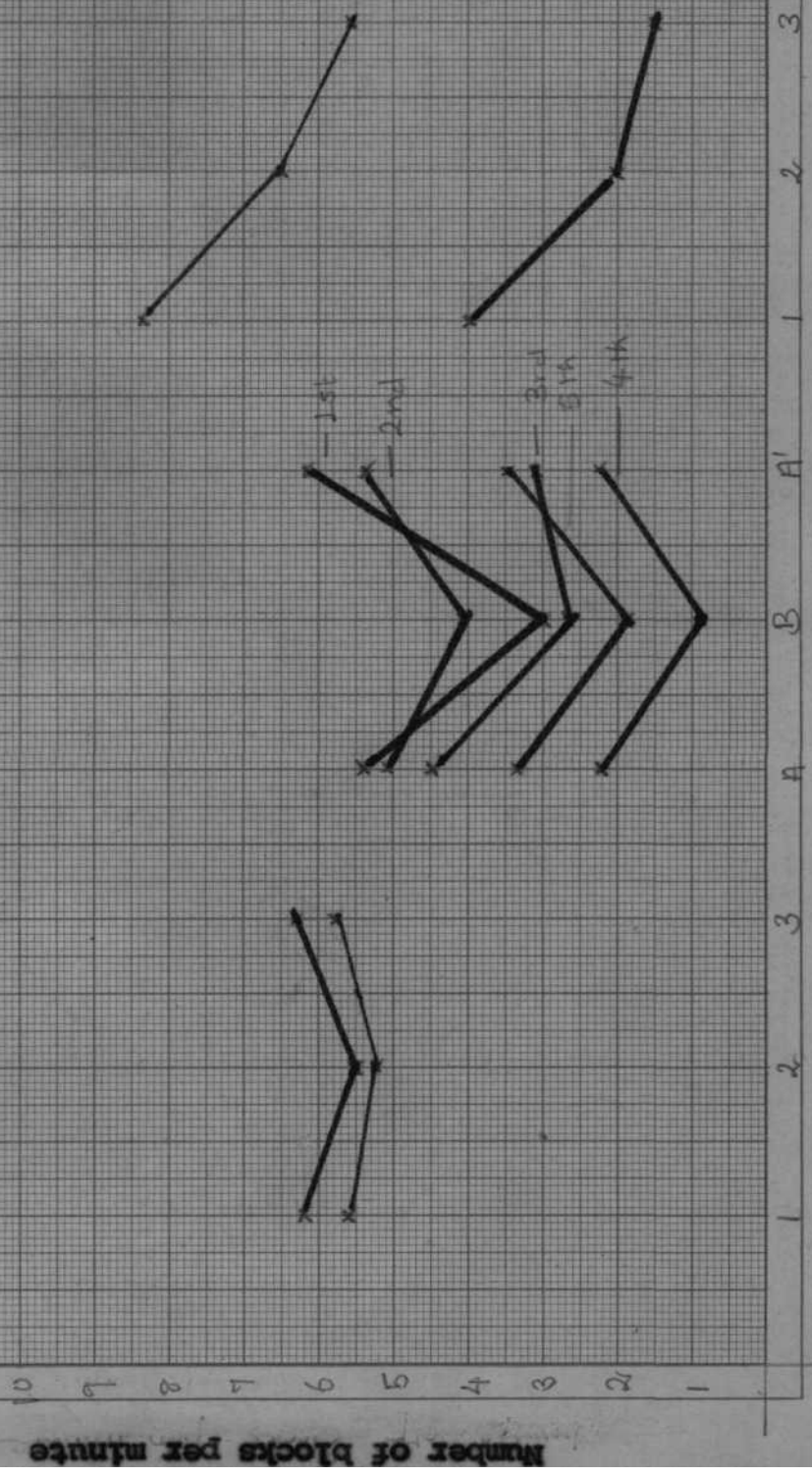
TABLE-3 Showing the significance of difference of the number of blocks in each part of the experiment.

Subject	Condition	Experiment Part-1 Vs Experiment Part-3		Experiment Part - 2		
				A Vs B	B Vs A'	A Vs A'
		Sponta- neous speech	Reading.			
1	Highlighting Fluency in reading	-	+	+	+	-
3	Highlighting Fluency in reading	-		-	+	-
5	Highlighting Fluency in reading	-	-	+	+	+
2	Highlighting Dys- fluency in reading	+	-	-	-	-
4	Highlighting Dys- fluency in reading	+	+	+	+	-
6	Highlighting Dys- fluency in sponta- neous speech	+	+	+	+	+

TABLE-4 showing significance of syllable output difference in each part of the experiment

Subject	Condition	Experiment Part-1 Vs Experiment		Experiment part - 3		
		Spontaneous speech	Reading	A vs B	B Vs A'	A Vs A'
1	Highlighting fluency in reading	+	+	-	-	-
3	Highlighting fluency in reading	+	+	+	+	-
5	Highlighting fluency in reading	+	+	-	-	-
2	Highlighting dysfluency in reading	+	+	-	-	-
4	Highlighting dysfluency in reading	+	+	+	-	-
6	Highlighting dysfluency in spontaneous speech	+	+	+	-	+

Graph showing number of blocks in difference parts of experiment and in difference session for subject-1



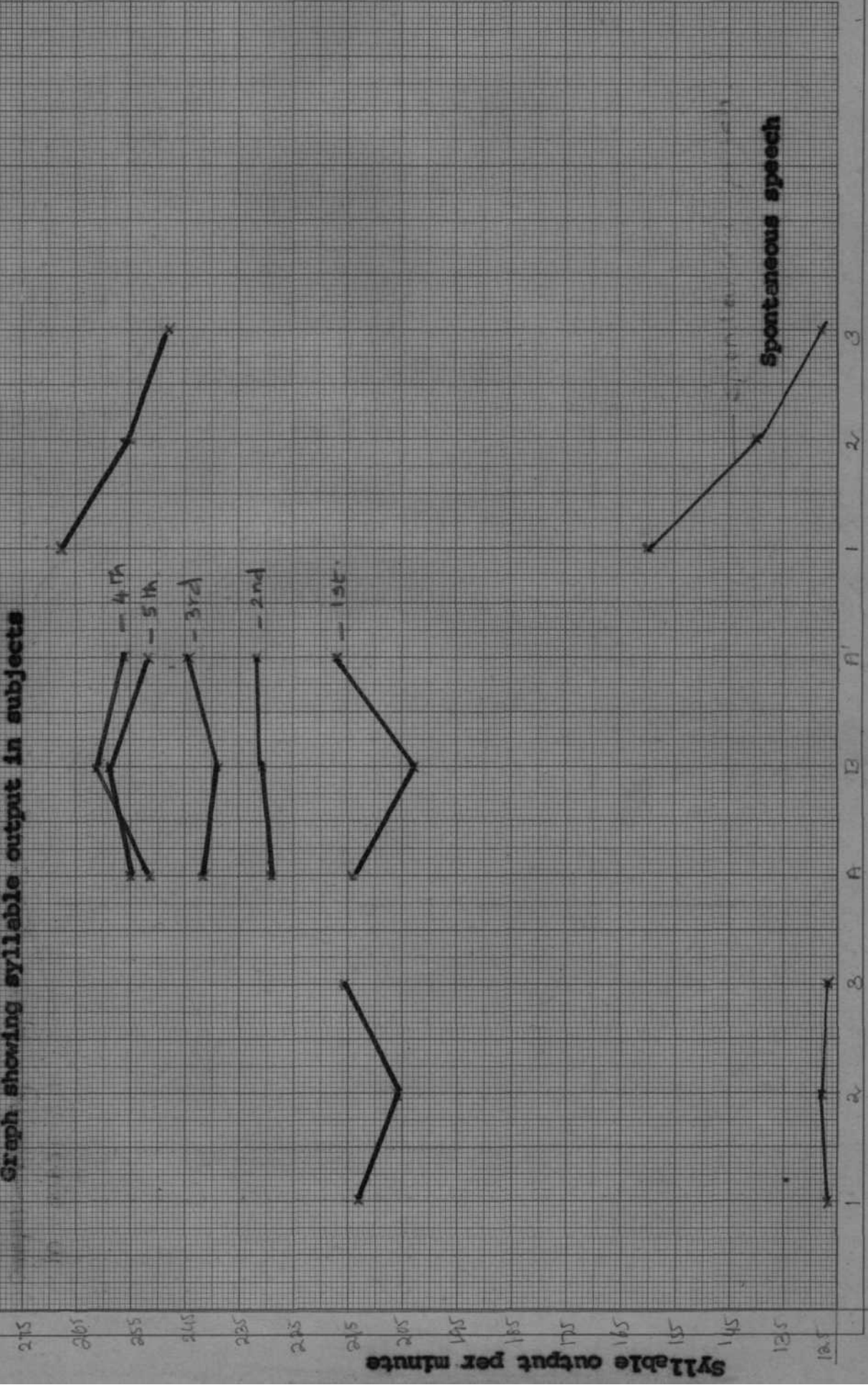
PART 3

PART 2

PART 1

Number of blocks per minute

Graph showing syllable output in subjects



The inspection of the table shows that there is a decrease in number of blocks when fluency is highlighted, as the mean of experiment part-2B is 2.54 and the mean of experiment part-2-A is 4.22. However, the withdrawal of highlighting stimulus in experiment part-2-A' is showing an increase in number of blocks which is almost equal to the condition before the introduction of highlighting stimuli i.e. experiment part-2A.

Further, the subject is showing decrease in mean number of blocks in reading in experiment part-3. It is interesting to note that the subject is showing an increase in number of blocks in spontaneous speech in experiment part-3, when compared to experiment part-1 in spontaneous speech. The syllable output is remained almost same even when the fluency highlighted in experiment part-2B, when compared to experiment part-2-A. And the subject is showing almost same number of syllable output even after the withdrawal of the highlighting stimulus in experiment part-2-A'. But the subject is showing a considerable increase in syllable output both in spontaneous speech and reading in experiment-Part-3.

The statistical analysis, using Wilcoxon, matched pair signed rank test, is indicating (table 3 & 4) that there is no significant change in number of blocks in spontaneous speech

when the base rate is compared with the number of blocks in experiment Part-3 i.e highlighting of fluency has no after effect on the number of blocks or stuttering in spontaneous speech. However, the same subject is showing a significant decrease in number of blocks when fluency is highlighted during reading. Similarly the subject is showing a significant decreases in number of stuttering blocks when highlighting stimulus is made contingent upon fluency (in experiment part 2-B).

Thus it can be stated that the highlighting when made contingent shows a significant reduction in number of blocks.

Thus the hypotheses 1-a(I), 1-b(I), 1-b(II) are rejected but 1-a(II) is accepted. Thus the highlighting of fluency can be considered to be effective both with respect to syllable output in reading and spontaneous speech as well as number of blocks in reading i.e. It is possible find a reduction in number of blocks and an increase in syllable output when fluency is highlighted in reading.

Further, as there is reduction in number of blocks in 2-B the hypothesis should be rejected, as highlighting of fluency reduces the number of blocks. However when this hypothesis is verified with reference to the results of experiment-3 i.e. after the withdrawl of the highlighting stimuli to examine the after

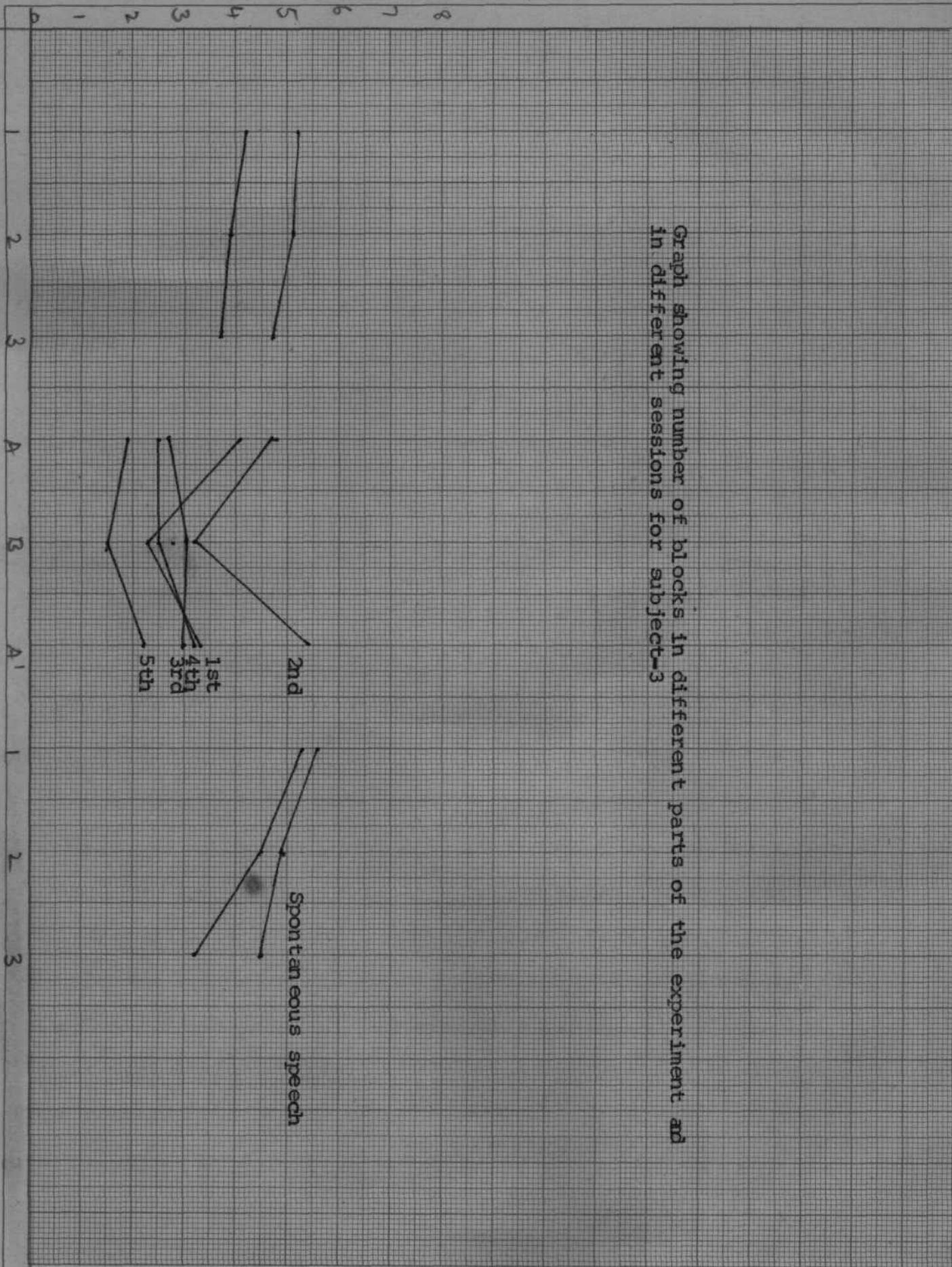
effects of the highlighting stimuli no significant difference is seen in spontaneous speech. But a thorough examination of the results of experiment-3 and the graph-1 representing the same indicates that the sudden upshooting in the number of blocks in session-1 is masking the definite reduction in stuttering shown in session2 and 3 of the experiment part-3. This can be explained on the basis of the "operant extinction curve" which has the tendency first to go up and next to steeply fall. Thus it can be considered that the highlighting of fluency has after effect also i.e., to reduce the number of blocks and to increase the syllable output.

Subject-3 recieved highlighting of fluency in reading Table-1 and 2 show the mean number of blocks and mean syllable output per minute in experiment part-1, 2 and 3.

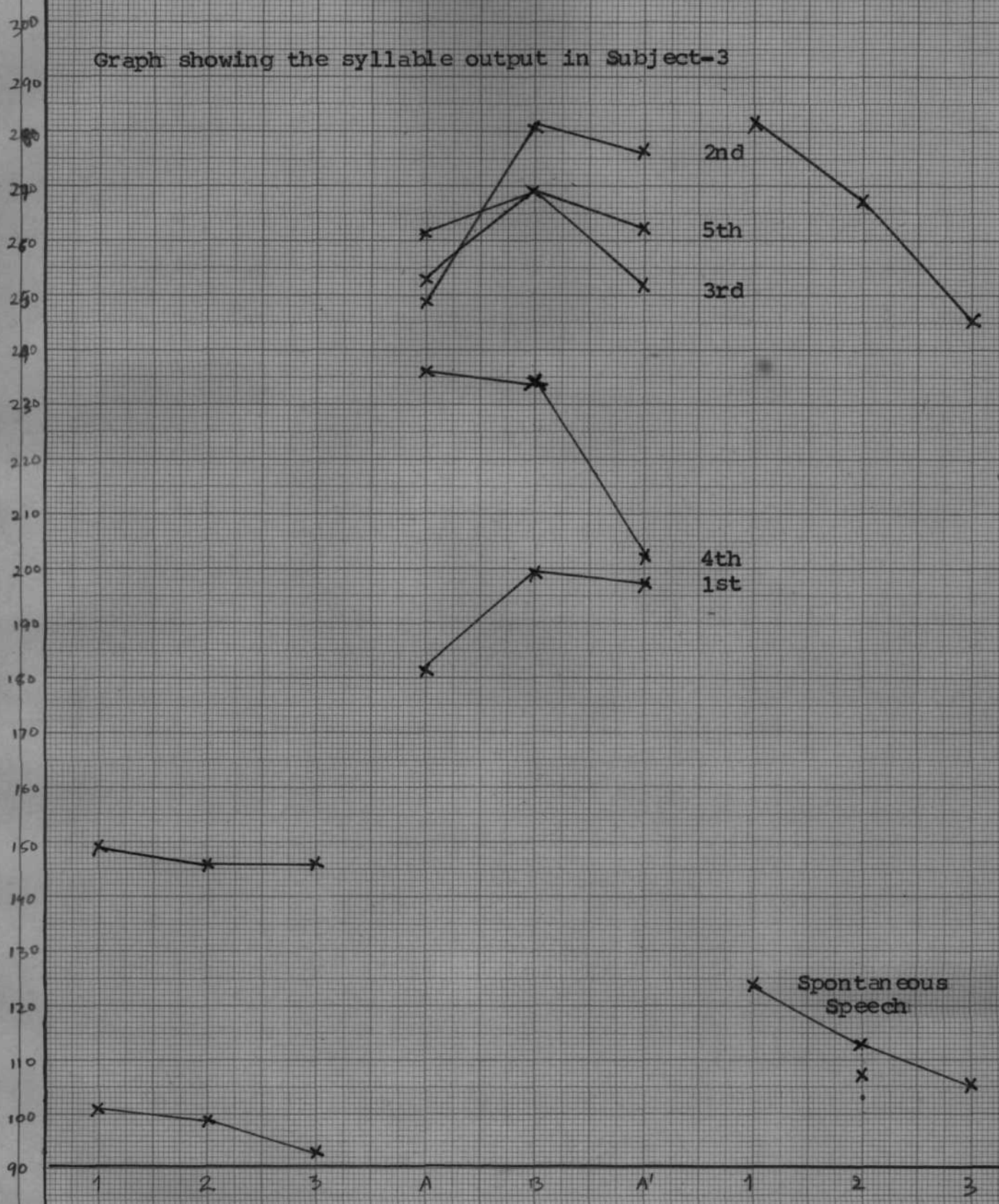
From table-1 it can be male out that there is evident decrease in number of blocks when the highlighting stimulus is presented (i.e. experiment part-2-B). The mean number of blocks have shown a decrease from 3.2 (in 2.A) to 2.54 (in 2.B) The number of blocks have again increased to 3.5 in 2-A' when the highlighting stimulus is with drawn.

Number of blocks

Graph showing number of blocks in different parts of the experiment and in different sessions for subject-3



Graph showing the syllable output in Subject-3



Inspection of the results of Experiment-Part-1 and Experiment-Part-3 reveals that there is a decrease in number of blocks in spontaneous speech but the mean number of blocks have increased in reading. The mean number of blocks have reduced from 5.1 to 4.9 and the number of blocks in reading have shown an increase from 4.0 to 4.3.

The syllable output is increasing in 2.B with the introduction of the highlighting stimulus. The syllable output in 2-A is 236.36 and has increased to 250.64 in 2-B. But it again is reducing i.e; 238.24 in 2-A' with the withdrawal of the highlighting stimulus.

The difference in syllable output is much evident in reading when experiment part-1 and part-3 are compared. The part-1 syllable output is 147.2 in reading become and 264.7 in part-3. The increase in syllable output for spontaneous speech is too present, but not as much as in reading. Here the syllable output has increased from 97.5 to 114.4.

The statistical analysis of this data has shown as presented in table 3 and 4 that there is no significant difference in number of blocks between experiment-part-2-A and experiment-part-2-B. But the difference between part-2-B and part-2-A' is significant.

Again the difference between part-2-A and 2-A' has shown no significant difference. In terms of syllable output the difference between part-2-A and part-2-B is significant as well as the differences between part-2-B and 2-A'.

But difference between 2-A and 2-A' is not significant. The difference in syllable output in spontaneous speech as well as reading between experiment part-1 and experiment-part-3 are significant and the difference of number of block is not significant both for spontaneous speech as well as reading.

Thus the hypotheses 1-a(I), 1-a(II) are accepted and hypotheses 1-b(I) and 1-b(II) are rejected. Thus the highlighting of fluency is effective in increasing the number syllable output but having no significant effect on number of blocks. However the detail analysis of the data shows that there is a shooting in the number of blocks in the first session and steep fall in the total number of blocks in the sessions 2 and 3. This phenomena can be explained using "the operant extinction curve proposed by Azrin & Holz 1961))

In this case the statistical insignificance of the differences between number of blocks between experiment-1 and experiment-3 has forced the acceptance of the hypotheses 1-a(I), 1-a(II) but the typical operant extinction response is evident from the

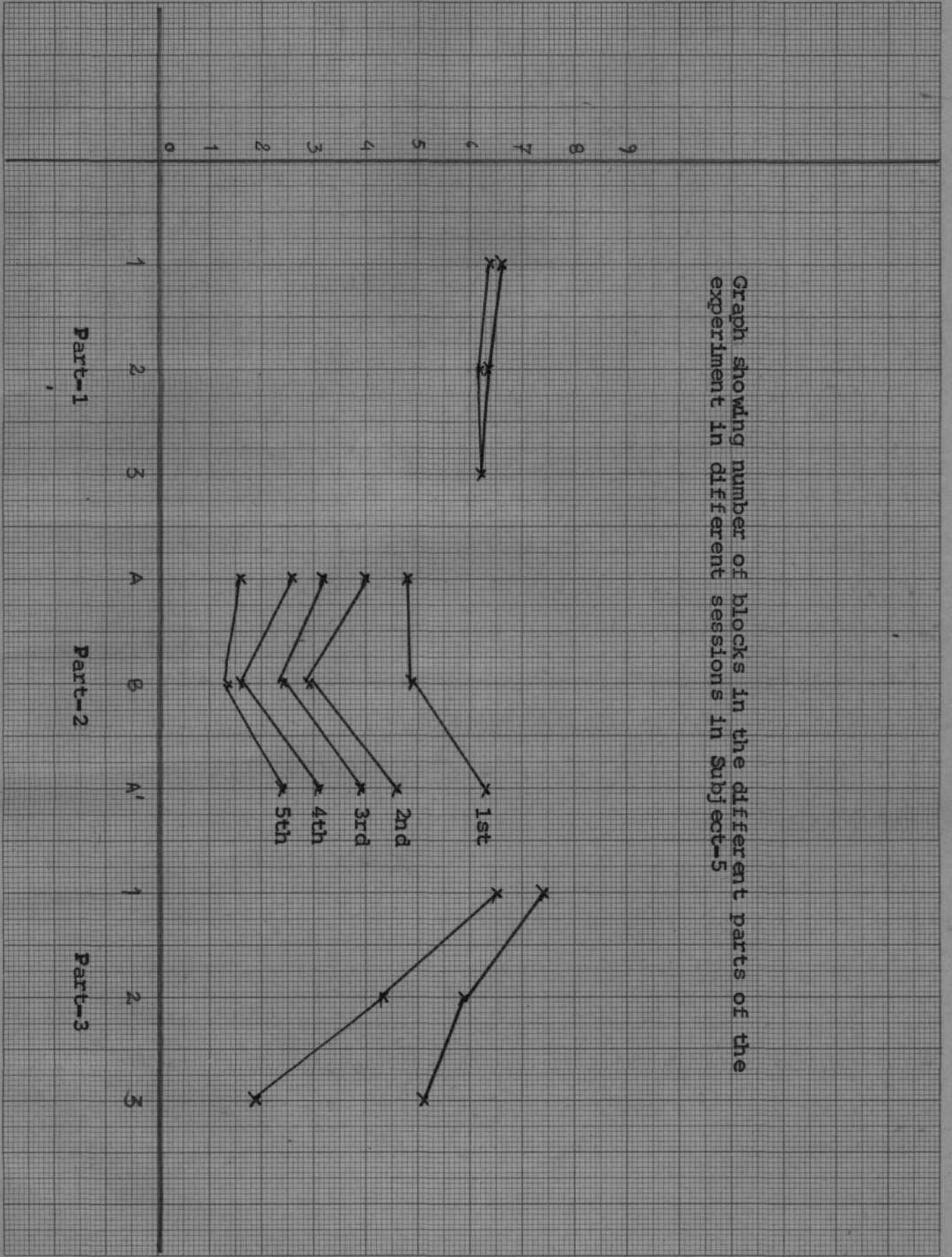
date of experiment Part-3. Thus the statistical insignificance can be explained. Therefore it can be considered that highlighting of fluency has the effect i.e., of reducing number of blocks in reading and increasing the syllable output.

Fluency was highlighted in reading for subject-5.

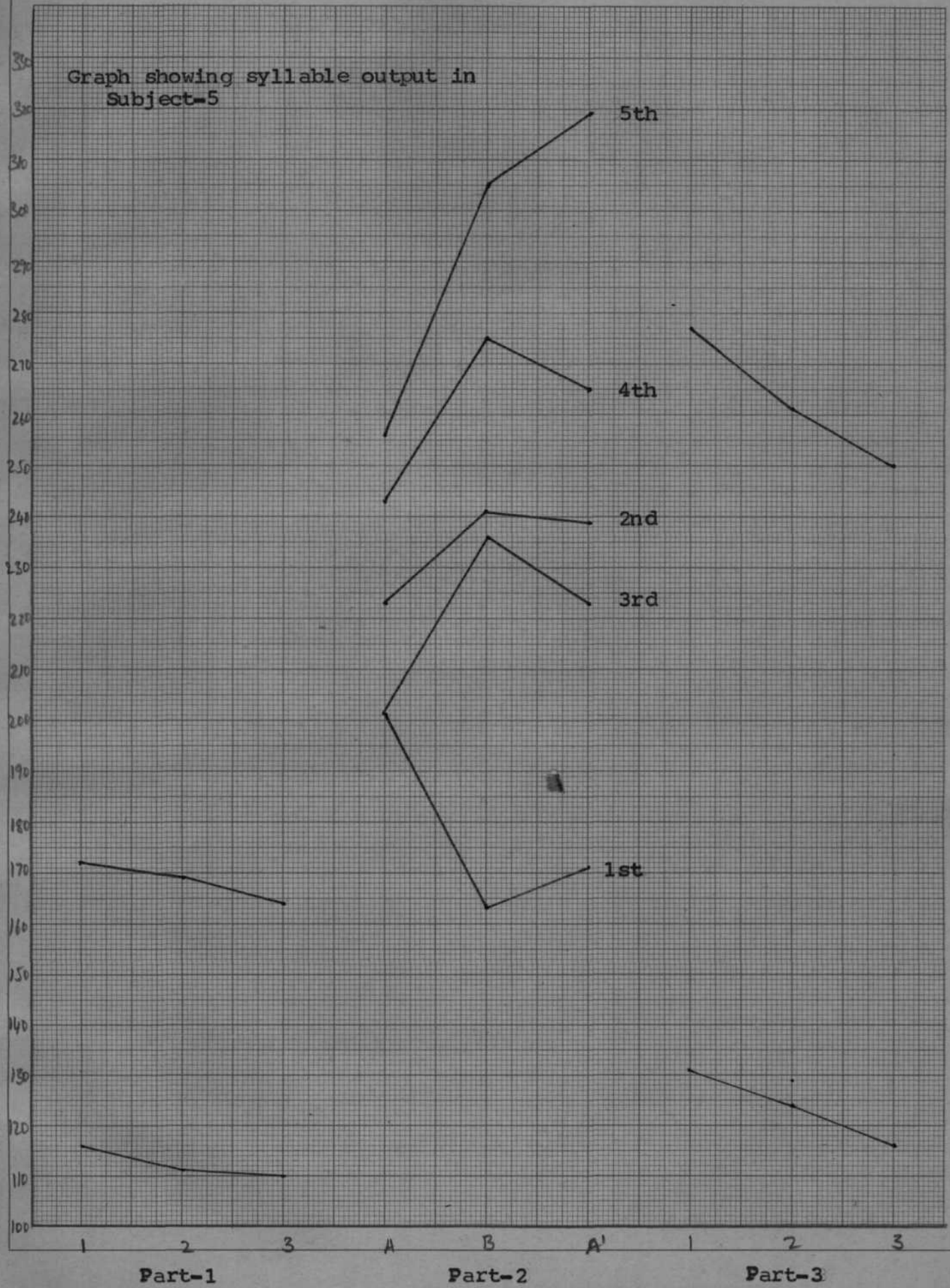
The table-1 indicates that introduction of the highlighting stimulus had an effect on the number of blocks, which reduced from 3.24 (In 2.A) to 2.62 (In 2-B). The withdrawal of the stimulus has again increased the number of blocks to 4.08. The number of blocks have shown reduction when experiment part-1 and experiment part-3 are compared. In spontaneous speech the number of blocks have reduced to 6.1 (in experiment part-3) from 6.4 (experiment part-1). The number of blocks in reading also have decreased from 6.3 (in experiment part-1) to 4.2 (experiment part-3).

The syllable output has increased in 2-B with the introduction of highlighting stimulus (table-2). The mean number of syllables uttered per minutes in 2-A is 225.24 whereas in 2-B it is 244.4. There is negligible difference between 2-B and 2-A? 2-A' being 244.82. Difference in syllable output between experiment part-a and experiment part-3 in reading is much greater than in spontaneous speech. The syllable output

Graph showing number of blocks in the different parts of the experiment in different sessions in Subject-5



Graph showing syllable output in Subject-5



has increased from 112.3 (in experiment part-1) to 123.7 (in experiment part-3) for spontaneous speech and the syllable output 168.6 (experiment part-1) has increased to 262.9 (in experiment part-3) in reading. Statistical analysis and the study of table-1 show that there is a difference in number of blocks between A and B, B and A' as well as A and A' and they are significant. However, the difference between experiment-1 and experiment-3 is not significant both for reading as well as spontaneous speech.

Surprisingly enough exactly the opposite is the result for syllable output. The difference, in syllable output between A and B, B and A' and A and A' are not significant. But the difference between experiment part-1 and experiment part-3 is significant for both spontaneous speech and reading.

thus in this case the hypotheses 1-a(I) and 1-a(II) are accepted, and 1-b(I) and 1-b(II) are rejected, indicating that the highlighting is effective in increasing syllable output in both reading and in spontaneous speech but no significant effect on the mean number of blocks.

This case too has shown a similar finding of up shooting in the number blocks in the session which has contributed for

the statistical insignificance of the difference. Therefore, even the results of subject-5 can be explained on the basis of operant extinction response curve and it can be stated that highlighting of fluency has the effect on occurrence of blocks in stutterers i.e, the highlighting of fluency reduces number of blocks in stutterers.

In conclusion it can be stated that, the subjects, 1,3 and 5 have shown reduction in number of blocks when the fluency, at least for a duration of 5 secs, is highlighted. Further, the reduction in number of blocks are also observed in the post experimental (experiment-3). However this reduction has not been found to be significant as there is sudden increase in number of blocks in the first session of the experiment-3, which can be explained on the basis of "operant extinction curve".

The increase in syllable output has observed both in the experimental condition (experiment-2) and post experimental condition (experiment-3) in all the 3 subjects. Thus decrease in number of blocks and increase in syllable output is seen when fluency is highlighted in stutterers.

Dysfluency in reading was highlighted in case of subject-2. The analysis of the results with this case indicates a minimal difference between experiment part-2A, 2-B and z-A' both with

SYLLABLE OUTPUT IN SUBJECT-2

SYLLABLE OUTPUT

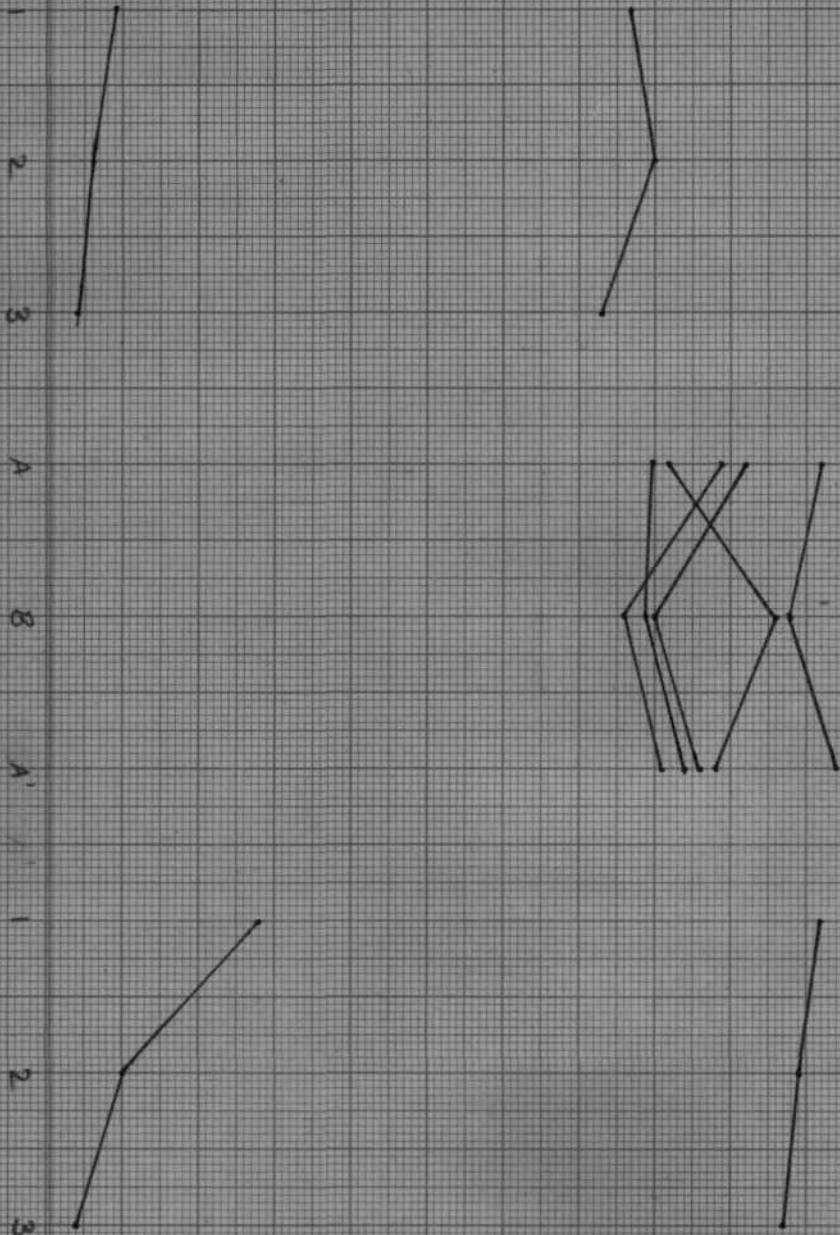
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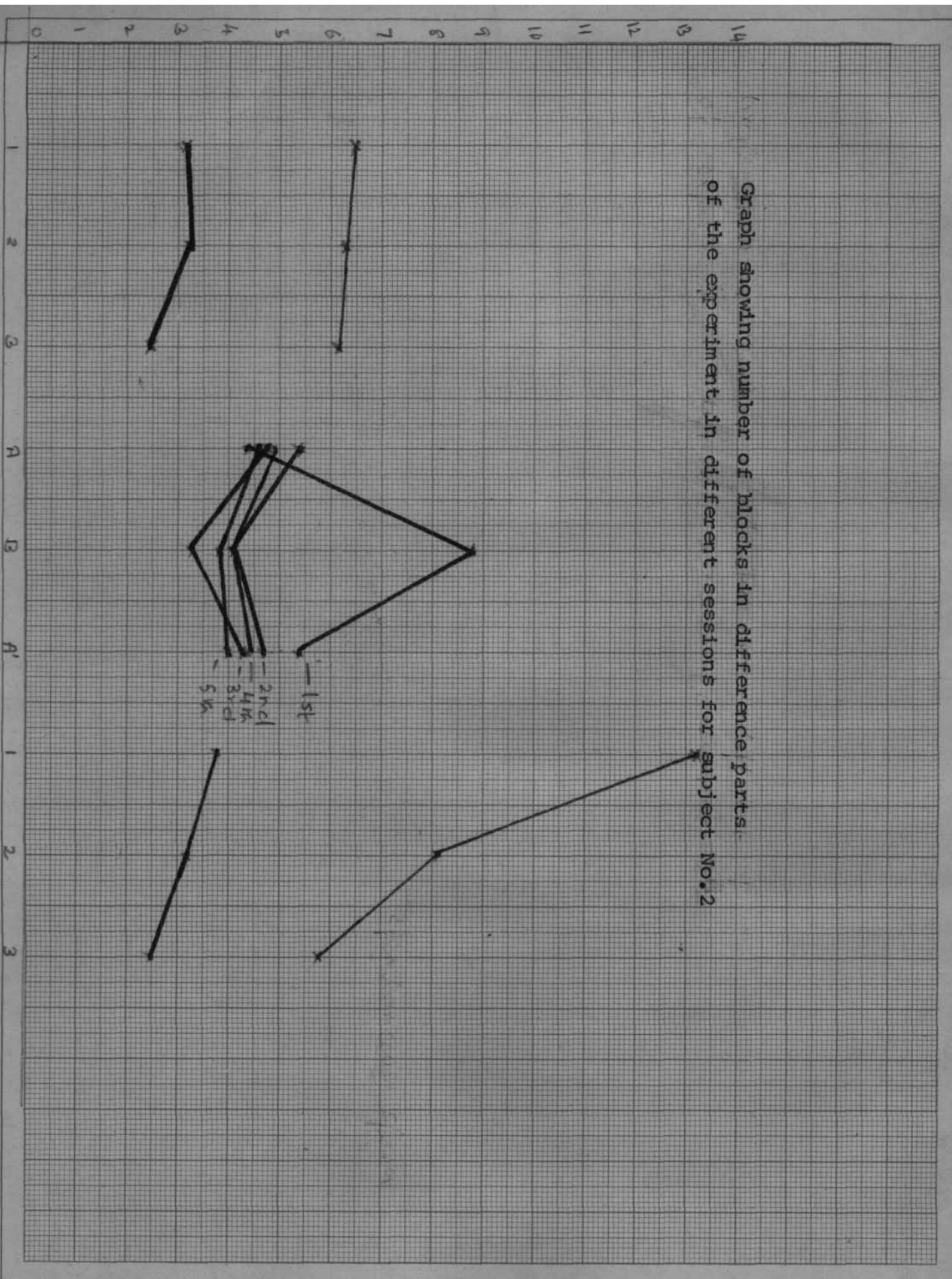
4 8

4

1 2 3



Graph showing number of blocks in difference parts of the experiment in different sessions for subject No. 2



respect to number of blocks and syllable output. The syllable output in 2-A is 150.64, in 2-B it is 148.06 and in 2-A' 151.14. The number of blocks in 2-A and 2-B are exactly same i.e. 4.8 and in 2-A', it is 2.56 as depicted in the table-1 and II and graphic representation in graphs 2a and b.

The number of blocks have shown an increase both in spontaneous speech and in reading in part-3, when experiment-part-1 and experiment part-3 are compared. In spite of this, the syllable output has shown an increase both in reading and spontaneous speech in experiment-3. The syllable output has increased from 66.5 to 74.2 in spontaneous speech and from 274.5 to 321.6 in reading.

The statistical analysis reveals no significant difference between 2-A and 2-B, 2-B and 2-A' and 2-A and 2-A' in term of number of blocks and syllable output. Only the number of blocks in reading shows no significant difference when experiment part-1 and experiment part-3 are compared.

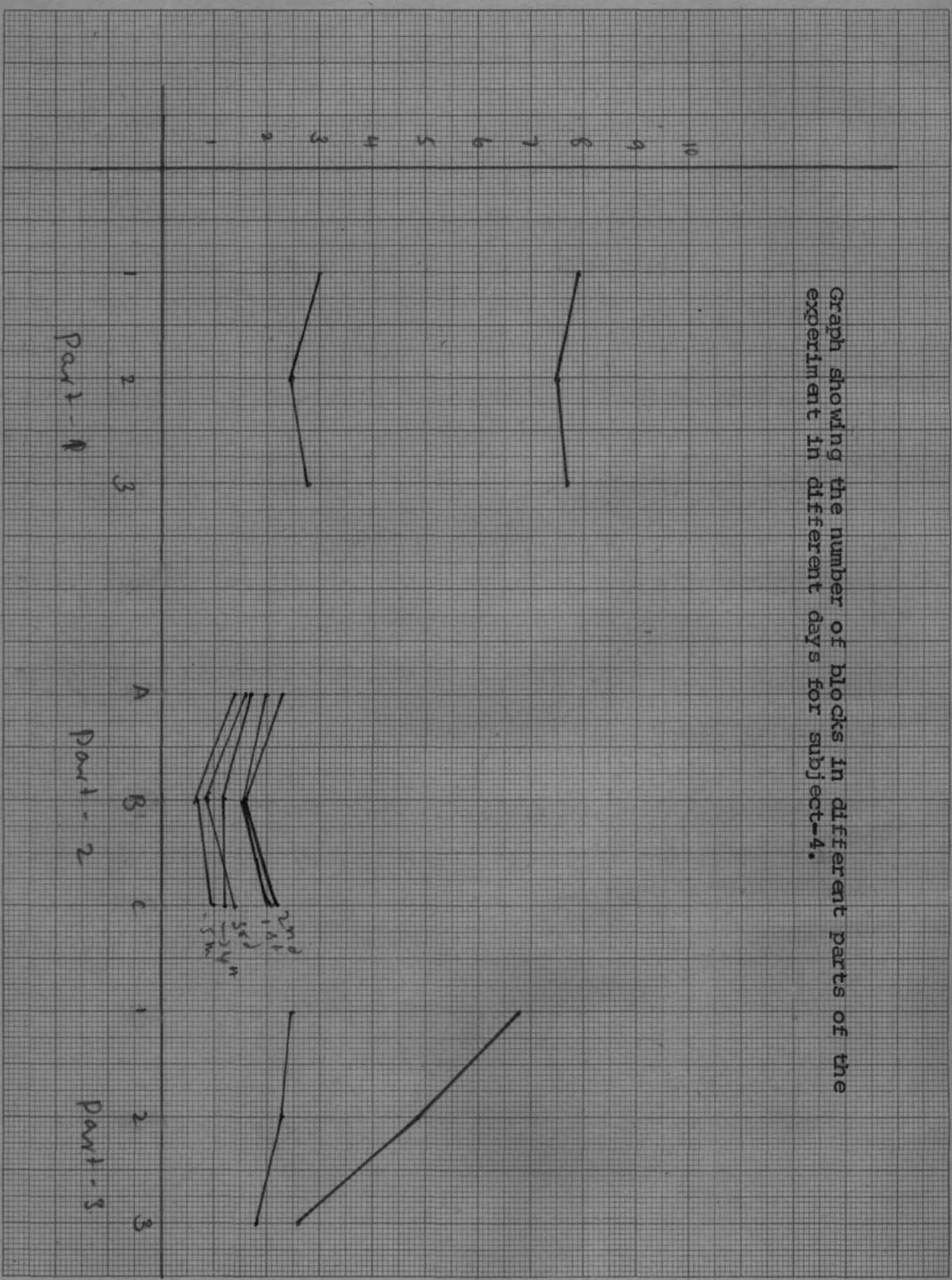
The difference in number of blocks in spontaneous speech is significant. The difference in syllable output is significant both for the spontaneous speech and reading as shown in table 3 & 4 and graph 2-a and 2-b.

Thus the hypotheses 2-a(I) is accepted and 2-a(II), 2-b(I), 2-b(II) are all rejected i.e., the highlighting of dysfluency has effect on the number of blocks and on the syllable out put in this subject both immediately after the highlighting of dysfluency and after 24 hours and beyond of highlighting. Therefore/ it can be stated that there is after effect of highlighting of dysfluency in reading on spontaneous speech and reading in stutterers.

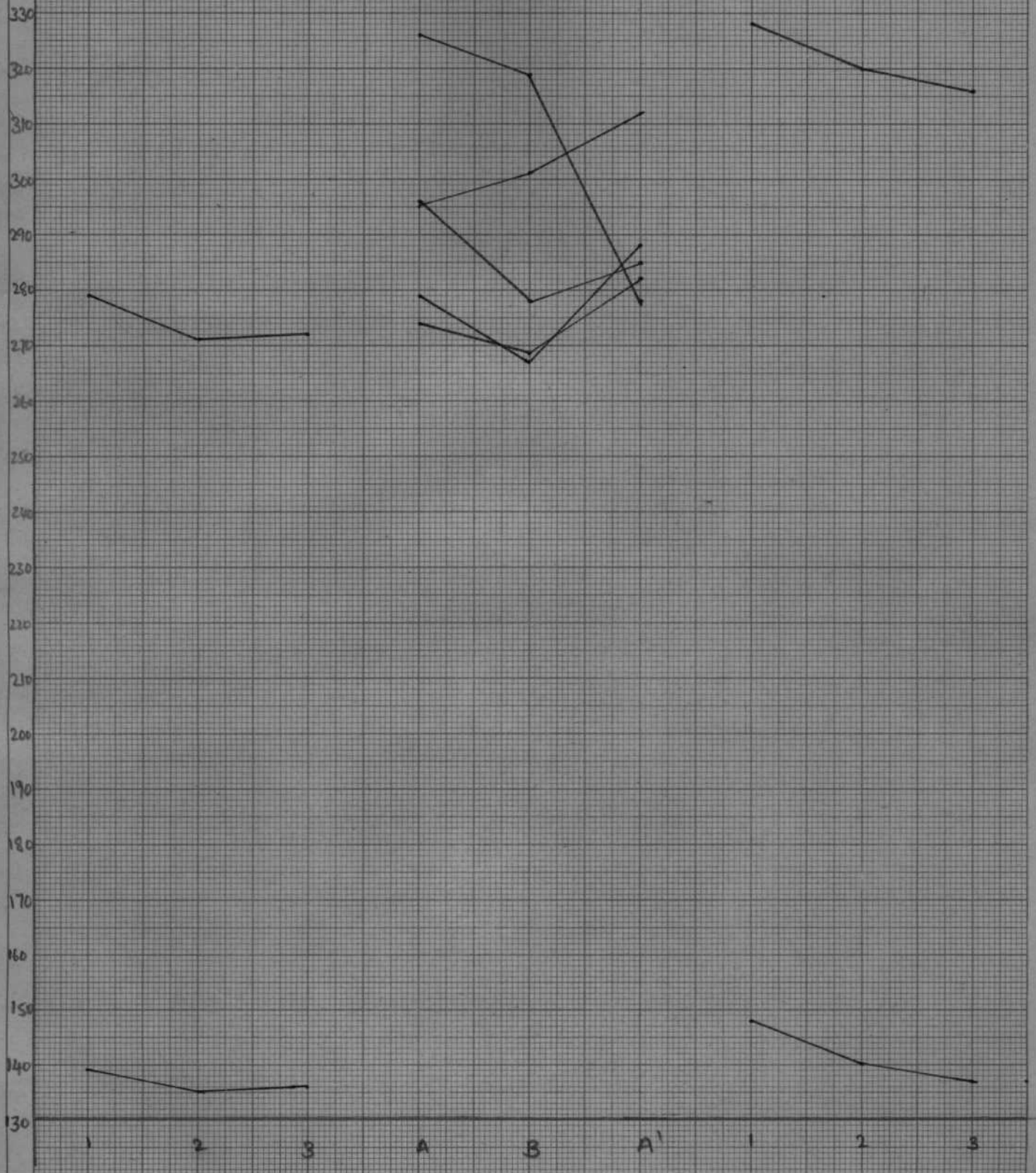
Subject-4:

Subject-4 received highlighting of dysfluency in reading. The results again indicated a decrease in the number of blocks with the introduction of highlighting stimulus in 2-B. The mean number of blocks in 2-A is 1.8 which is reduced to 1.22 in 2-B. Again it has increased to 1.58 in A' with the withdrawal of the highlighting stimulus. There is a decrease in the number of blocks in experiment-3 when compared to experiment-1 both in spontaneous speech and reading (Graph 4-a,4-b). There is a decrease in the syllable output in the experiment 2-B when the highlighting stimulus is introduced. The syllable output in experiment 2-A is 294.76 which reduced to 286.7 in 2-B and against in 2-A' it increases 289.5. There is increase in syllable output in spontaneous speech as well as in reading

Graph showing the number of blocks in different parts of the experiment in different days for subject-4.



SYLLABLE OUTPUT OF SUBJECT-4



when experiment part-1 and part-3 are compared. The syllable output in spontaneous speech increases from 136.8 to 143.4 and also in reading it increases from 274.5 to 321.6.

The statistical analysis shows a significant difference in number of blocks between 2-A and 2-B, and 2-B and 2-A'. The difference between 2-A and 2-A' is not significant. There is a significant difference in number of blocks between experiment 1 and experiment-3 in reading but in spontaneous speech it remains unaffected. With regards to syllable output there is a significant difference between A and B only. The difference between B and A' and A and A' are not significant which is indicated in the Table 3 and 4.

The difference between experiment-1 and experiment-3 show a significant increase in syllable output. Therefore the hypotheses 2-a(I), 2-a(II), 2-b(I), 2-b(II) are rejected with reference to the above case. In words, the highlighting of dysfluency during reading. In this stutter, has reduced the number of blocks and increased the syllable output.

Thus both the cases who received highlighting of dysfluency, during reading, have rejected the hypotheses that there will no significant effect on number of blocks and syllable output

When the syllfluency is highlighted, i.e., both the stutters have been shown decrease in number of block and increase in syllable output.

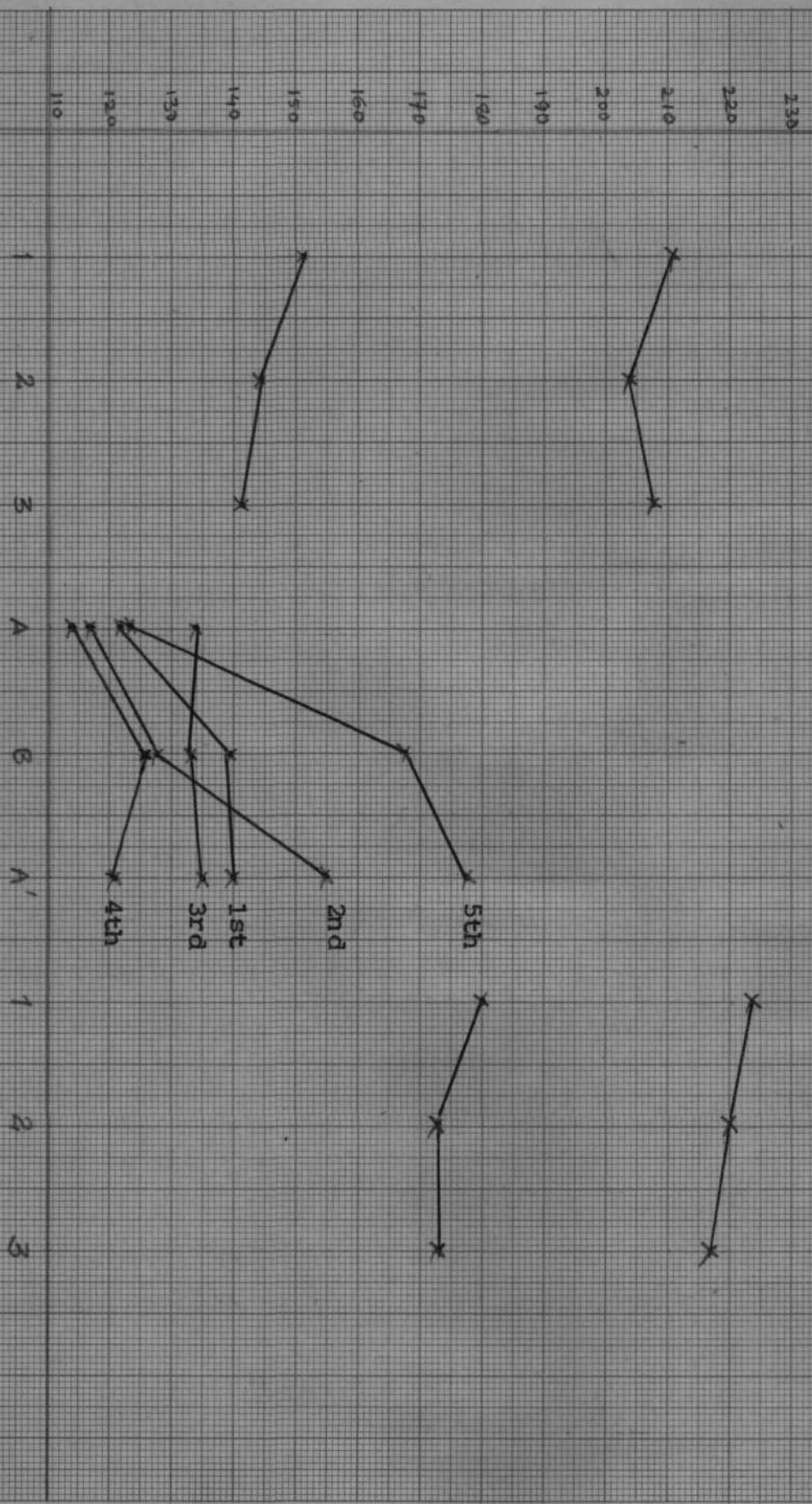
Subject-5

In subject-6 dysfluency in spontaneous speech was highlighted and not in reading. The results show that the introduction of the highlighting causes a reduction in number of blocks. This is evident from the data; i.e., 7.26 blocks in 2-A has come down to 4.62 blocks in 2-B and 5.5 in 2-A'. A comparison of results of experiment-1 and experiment-3 shows a decrease in number of blocks both in reading and in spontaneous speech. Thus, 8.4 blocks in spontaneous speeches have reduced to 4.5 and 3.2 blocks in reading have decreased to 2.2.

The syllable output, however, has increased both in 2-B as well as in 2-A' compared to 2-A. There is also an increase in syllable output in both reading and spontaneous speech in experiment-3 when compared to experiment-1.

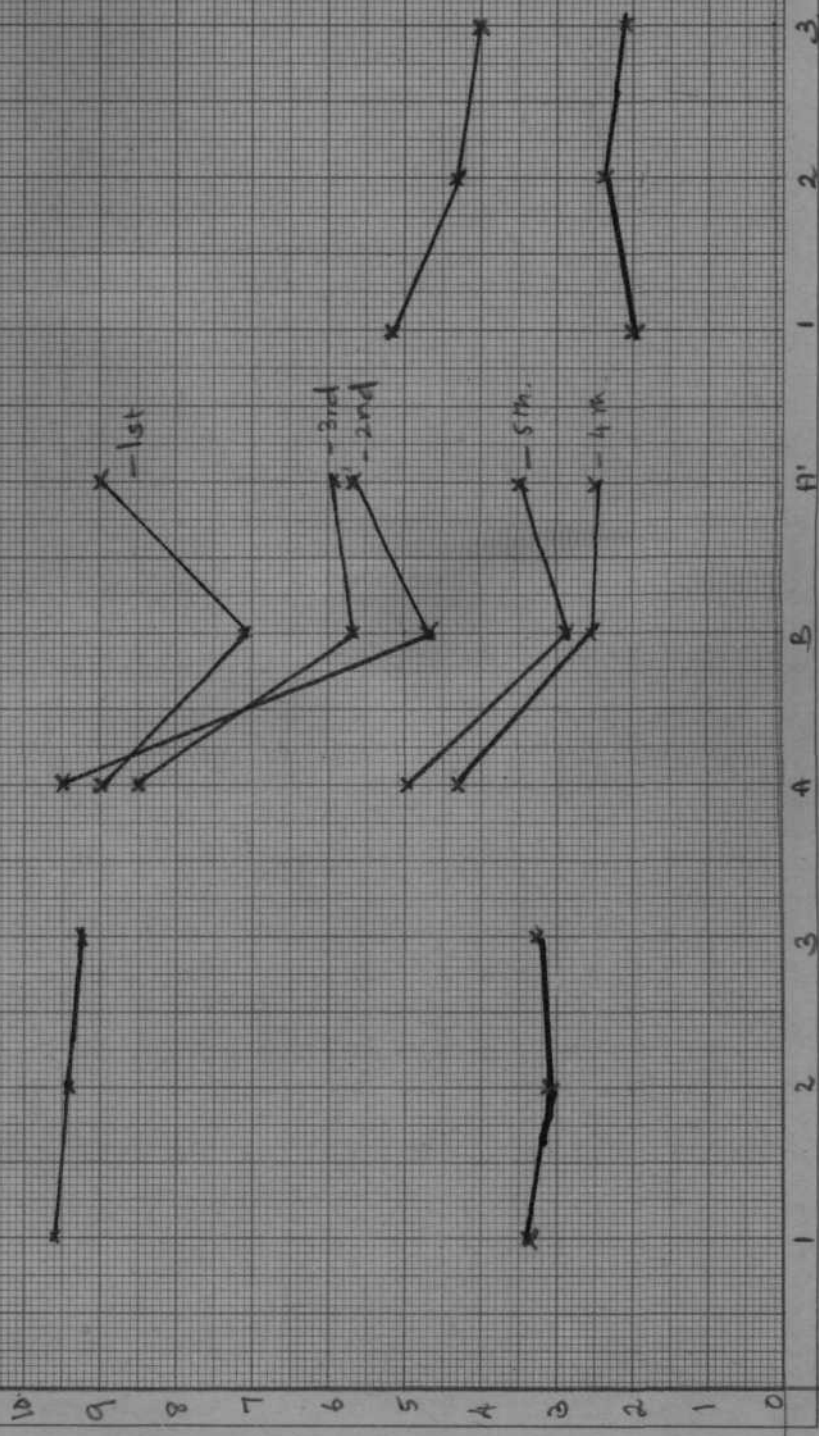
The statistical analysis shows a significant difference between experiment-1 and experiment-3 both with respect to

SYLLABLE OUTPUT OF SUBJECT-6



Number of blocks in subject number 6 in different parts of the experiment on different session

Handwritten notes:
 1st session: 10 blocks
 2nd session: 10 blocks
 3rd session: 10 blocks
 4th session: 10 blocks
 5th session: 10 blocks
 6th session: 10 blocks
 7th session: 10 blocks
 8th session: 10 blocks
 9th session: 10 blocks
 10th session: 10 blocks



number of blocks as well as syllable output in reading and spontaneous speech.

The difference between A and B, B and A' and A and A' are significant for number of blocks as shown in table 3 & 4. The difference between A and B and A and A' are significant for syllable output too, but the difference between B and A' is not significant. Comparison of experiment-1 and experiment-3 indicates that this subject has decrease in number of blocks both in spontaneous speech and reading and it is significant. The syllable output has increased significantly both in reading and spontaneous speech.

The hypothesis 2-a(I), 2-a(II), 2-b(I) and 2-b(II) with reference to the above subject, are rejected. Thus the highlighting of dysfluency in spontaneous speech has also shown reduction in number of block both in spontaneous speech and reading. Thus all the three subject have reduction in number of blocks and increase in syllable output where the dysfluency. Therefore based on the results of this group is highlighted i.e., the subjects whose dysfluencies have been highlighted it can be stated that the highlighting of dysfluency reduces the number of blocks and increase the syllable output in stutterers.

Though the syllable output increased significantly in both the groups and in both reading as well as spontaneous speech, group-1 subjects in general show with greater increase in the syllable output in reading than the group-2 subjects.

The subject 1, 2, 3, 4 and 5 show greater increase in the syllable output in reading than in spontaneous speech. Only subject-6 who had received highlighting of dysfluency in spontaneous speech show a greater increase in the syllable output in spontaneous speech than in reading. This may be because the spontaneous speech was used for highlighting.

It is only the subject-6 who shows a reduction of blocks in B and again increase in A'; but still the number of blocks in A' being less than A. And all these differences are statistically significant. Moreover the number of blocks have reduced significantly both in reading as well as spontaneous speech. This result indicates a residual effect of highlighting and is beneficial in terms of reducing the stuttering.

Thus highlighting fluency and dysfluency have shown reduction in the number of blocks and increase in syllable output. Therefore highlighting either fluency or dysfluency can be used as therapy to reduce the number of blocks in stutterers.

An attempt was made to note the possible differences in the effects of highlighting fluency and dysfluency. The inspection of the tables 1, 2, 3 and 4 and graphs 1-a, 1-b, 2-a, 2-b, 3-a, 3-b, 4-a, 4-b, 5-a, 5-b 6-a and 6-b it can be stated that the highlighting of dysfluency has shown a statistically significant reduction in the number of blocks. Whereas the highlighting of fluency has not shown such statistically significant reduction in number of blocks. This statistical insignificance has been explained on the basis of operant extinction curve. Without considering the statistical significance it can be stated that both fluency and dysfluency are effective in bringing about reduction in number of stuttering blocks. Thus the results of the present study are in agreement with the results of studies by Vijayalaxmi(1973) Basalingappa (1980), Srinivas (1981), Seigel and Martin(1968), Manning et al (1974), Martin, Kuhl and Haroldson (1972).

The reduction in the number of stuttering blocks and increase in the syllable output when the fluency/dysfluency was highlighted in the subjects of the present study can be explained based on the statement given by Vijayalaxmi (1973) who states that "the fluency of stutterers are potential carrier of their own reward such that increase in subjects attention to the response evokes the rewarding properly and thus fluency will be

increased or in other words stuttering will be decreased.

And further Seigel and Martin (1968) who have advanced the highlighting phenomena state that any stimulus which highlights decreases the dysfluencies. Further they try to explain by stating that it may be "that dysfluencies of normal adult speakers are potential carriers of their own punishment such that increase in the subjects attention to the response evokes the punishing properly (Seigel, 1970).

Many have recommended the procedures used to increase the fluency which concentrate fluency than to use the procedures to decrease dysfluencies. Man Riper and others (1976) have recommended such therapies, particularly in case of Children, as more useful.

In this regard Hegde (1977) states that there are positive reinforcement procedures that can be applied to desired behaviour as a result, "incompatible and undesirable behaviours might show a concomittant decrease in frequency. Neighter is stutterers speech restricted to dysfluencies. Indeed on an average stutterers are known to be fluent on better than 90% of the words they read (Bloodstein 1944). Fluency the target, in other words does exist about at a less than desired level.

Consequently, one need not resort to such time consuming procedures as shaping in order to manipulate fluency purely from a clinical stand point it would seem more appropriate to directly enhance the fluent behaviour of stutterers than to modify stuttering".

Thus highlighting of fluency/dysfluency is recommended useful economical therapeutic procedure in bringing about reduction in blocks in case of stutterers.

CHAPTER - V

SUMMARY AND CONCLUSION

Various researchers have tried to manipulate dysfluency and enhance fluency using various methods. Thus two different approaches have resulted (1) fluency enhancement (2) dysfluency modification. Studies by earlier researchers indicate , that the fluency can be enhanced by concomittant decrease in dysfluency by highlighting fluency. And others have manipulated dysfluencies.

The present study was conducted to verify the effects of highlighting of fluency and highlighting of dysfluency in different subjects.

The study consisted of six subjects who had visited All India Institute of Speech and Hearing and diagnosed as having moderate stuttering. One of the quiet rooms of department of speech pathology was selected for the purpose of the study where all the experiments were conducted.

For all the subjects the base rate for number of blocks and syllable output were determined in spontaneous speech and in reading by taking the average of 3 experimental (Part-1)

sessions, each lasting for 15 minutes of reading and speaking on any topic for 15 minutes. The subjects 1,3 and 5 were considered as belonging to group-1 and it was decided that the fluency at least for a duration of 5 sec, in these subjects will be highlighted during reading. The subjects 2,4 and 6 were considered as group-2 and the dysfluencies in these cases was highlighted. However, as the subject number-6 showed very few number of blocks in reading it was decided to highlight dysfluency in spontaneous speech.

In the experimental session during the first 10 minutes the subject read a passage without the presentation of highlighter. This was considered as

In the second 10 minutes (B), highlighting stimulus was presented concomittant on the blocks or for every 5 seconds of fluent speech depending upon whether the subject received highlighting of dysfluency or fluency respectively by the experimenter. The experimenter said the word look (or nodi) to highlight the fluency or dysfluency as required.

The third ten minutes (A) was similar to A when the highlighting stimulus was withdrawn.

Thus five experimental sessions of thirty minutes each were conducted with a gap of twentyfour hours between two successive sessions.

3 post experimental sessions (considered as experiment-3) were held to have the ratings post experimentally. These were similar to the pre-experimental sessions.

Using a tape recorder the spontaneous speeches and the readings during experiment 1, 2 and 3 were recorded. Thus the highlighting was done in reading for 5 subjects and in spontaneous speech for one subject. Three out of the 5 subjects received highlighting of fluency in reading, the other two received highlighting of dysfluency in reading. The one subject whose spontaneous speech was highlighted received the highlighting of dysfluency.

All the recordings were analysed with the help of 2 post graduate students in speech pathology as judges to obtain the number of blocks, in each of the sessions separately. The experimenter determined the syllable output per minute in each session. Thus the number of blocks and the syllable output were determined for all the subjects both in reading and spontaneous speech.

Further the mean number of blocks and mean syllable output for each subject in each session were determined. Using the

Wilcoxon matched pair signed rank test the statistical significance of the difference of the mean number of blocks and the syllable output between pre and post experimental condition and between 3 sessions of experiment-2 (A, B and A') were determined. The results warrant the following conclusions (1) Subject showed significant difference in terms of number of blocks in reading when fluency was highlighted.

(2) Subject-3 did not show any significant change in number of blocks when the fluency was highlighted.

(3) When the fluency was highlighted in subject-5 there was no significant difference in the number of blocks.

Thus all the 3 subjects did not show significant difference when fluency was highlighted in spontaneous speech and reading except for the subject-1 who showed a decrease in number of blocks

However, a deep inspection of the data indicates that the decrease in number of blocks shown in the last 2 sessions of experiment-3 has been masked by the upshooting of the number of blocks in session-1 which can be explained on the basis of operant extinction curve as proposed by Azrin and Holz (1963).

All the 3 subjects have shown an increase in the syllable output. Therefore it can be concluded that the highlighting of fluency in stutterers increases the syllable output and decreases the number of blocks.

All the 3 subjects i.e. of group-2 have shown significant decrease in number of stuttering blocks both in reading and spontaneous speech except for subject-2 who has shown no change in reading and slight increase in blocks in spontaneous speech. The insignificance of the difference and slight increase in number of stuttering blocks in subject-2 can be explained on the basis of operant extinction curve. And all the subjects have shown increase in number of syllable output both in spontaneous speech and in reading.

Therefore, it can be concluded that highlighting of dysfluency reduces the number of blocks and increases the syllable output in stutterers.

Thus based on the results of the present study it can be concluded that highlighting either fluency or dysfluency reduces number of blocks both in reading and spontaneous speech and can be used as a clinical procedure to treat stutterers.

Further research is indicated for the verification of the efficacy of the 2 approaches more accurately in a "compare and contrast" orientation.

Recommendation:

1. To find the long term effects of highlighting fluency and highlighting dysfluency as treatment for stuttering.
2. To repeat the study with a larger number of stutterers.
3. To make a comparative study of the effectiveness of the highlighting fluency and dysfluency.
4. To study the highlighting of fluency in spontaneous speech.
5. Auto highlighting (by the stutterer himself) of either fluency or dysfluency can be studied to note its effect on number of blocks and syllable output*

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APPENDIX

DETAILS OF THE SUBJECTS

SUBJECT-1

Name : Gangadhar

Number : 33152

Sex : Male

Age : 21 years

Severity of stuttering : Moderate

Previous therapy : Nil

Therapy given : Highlighting of fluency
in reading

Language used : English

Highlighting stimulus
used : Look

SUBJECT-2

Name : Manjunath

Number : 32983

Sex : Male

Age : 20 years

Severity of
stuttering : Moderate

Previous therapy : Nil

Therapy given : Highlighting of dysfluency
in reading

Language used : English

Highlighting stimu-: Look
lus used

SUBJECT-3

Name : Mallikarjuna

Number : 33942-4

Sex : Male

Age : 28 years

Severity of stuttering : Moderate

Previous therapy : Nil

Therapy given : Highlighting fluency in reading

Language used : Kannada

Highlighting stimulus used : Nodi

SUBJECT-4

Name	B.R.Prakash
Number	33032
Sex	Male
Age	27 years
Severity of stuttering	Moderate
Previous therapy	Nil
Therapy given	Highlighting dysfluency in reading
Languaged used	Kannada
Highlighting stimulus used	Nodi

SUBJECT-5

Name	D. NAGARAJA
Number	34824
Sex	Male
Age	30 years
Severity of stuttering	Moderate
Previous therapy	Nil
Therapy given	Highlighting fluency in reading
Language used	Kannada
Highlighting stimulus used	Nodi

SUBJECT-6

Name : Premanand

Number : 33172

Sex : Male

Age : 23 years

Severity of
stuttering : Moderate

Previous therapy : Nil

Therapy given : Highlighting dysfluency
in spontaneous speech

Language used : English

Highlighting
stimulus used : Look

DETAILS OF THE TABLES

TABLE-A

Following are the tables showing the number of block and syllable output
experiment in subject-1

Number of blocks per minute in spontaneous speech.

	<u>Experiment-1</u>	<u>Experiment-3</u>
1	5.8	8.4
2	5.3	6.7
3	5.9	5.8
Mean		

Number of blocks per minute in reading

	<u>Experiment-1</u>	<u>Experiment-3</u>
1	6.2	4.1
2	5.5	2.0
3	6.3	1.6
Mean		

Number of syllable output per minute in spontaneous speech

	<u>Experiment-1</u>	<u>Experiment-3</u>
1	127.1	159.6
2	128.3	141.1
3	126.9	127.5
Mean		

Number of syllable outputs in Reading

	<u>Experiment-1</u>	<u>Experiment-3</u>
1	214.4	268.4
2	206.1	254.9
3	215.8	248.6
Mean		

Number of blocks

	<u>Experiment-2</u>		
	A	B	C
1	5.5	3.1	6.2
2	5.3	4.1	5.5
3	4.6	2.7	3.2
4	2.3	0.9	2.4
5	3.4	1.9	3.5

Mean

Number of syllable outputs

	<u>Experiment-2</u>		
	A	B	C
1	214.6	202.7	217.4
2	229.5	231.7	232.0
3	242.6	240.5	245.1
4	252.0	261.3	256.2
5	254.4	254.6	252.4

TABLE-B

Number of blocks per minute in spontaneous speech

	Experiment-1	Experiment-3
1	6.5	13.2
2	6.3	8.1
3	6.1	6.9

Mean

Number of blocks ~~per~~ minute in reading

	Experiment-1	Experiment-3
1	3.1	3.7
2	3.2	3.1
3	2.5	2.5

Mean

Number of syllable outputs in spontaneous speech

	Experiment-1	Experiment-3
1	69.5	88.3
2	66.3	70.2
3	63.7	64.1

Mean

Number of syllable outputs in reading

	Experiment-1	Experiment-3
1	137.1	162.1
2	140.2	159.0
3	133.7	157.2

Number of blocks:

Experiment-2

	A	B	C
1	4.4	8.8	5.5
2	5.4	4.1	4.7
3	4.7	3.3	4.2
4	4.9	4.1	4.4
5	4.6	3.9	4.0
Mean			

Number of syllable outputs : Experiment-2

	A	B	C
1	142.3	156.7	149.1
2	152.3	140.1	146.0
3	149.6	135.9	141.7
4	150.6	149.2	154.4
5	162.1	158.4	164.5
Mean			

Table-C

Number of blocks per minute in spontaneous speech

	Experiment 1	Experiment 3
1	5.5	5.6
2	5.2	4.9
3	4.7	4.4
Mean		

Number of blocks per minute in Reading

	Experiment 1	Experiment 3
1	4.3	5.4
2	3.9	4.4
3	3.8	3.2
Mean		

Number of syllable outputs in spontaneous speech

	Experiment 1	Experiment 3
1	101.2	124.4
2	99.0	113.2
3	92.3	105.6
Mean		

Number of syllable outputs in Reading

	Experiment 1	Experiment 3
1	148.9	281.3
2	146.6	267.8
3	146.1	245.0
Mean		

Number of blocks	<u>Experiment 2</u>		
	A	B	A'
1	4.1	2.3	3.4
2	4.7	3.3	5.5
3	2.7	3.0	3.2
4	2.6	2.5	3.3
5	1.9	1.6	2.2
Mean			

Number of syllable outputs	<u>Experiment 2</u>		
	A	B	A'
1	181.7	198.4	197.2
2	249.7	280.0	276.5
3	261.4	270.4	252.8
4	236.4	234.0	202.3
5	252.6	269.9	262.4
Mean			

TABLE-D

Number of blocks per minute in spontaneous speech

	Experiment 1	Experiment 3
1	7.9	6.8
2	7.5	4.4
3	7.7	2.6
Mean		

Number of blocks per minute in Reading

	Experiment 1	Experiment 3
1	3.0	2.5
2	2.5	2.3
3	2.4	1.8
Mean		

Number of syllable outputs in spontaneous speech

	Experiment 1	Experiment 3
1	139.0	147.8
2	135.4	144.9
3	136.0	137.5
Mean		

Number of syllable outputs in Reading

	Experiment 1	Experiment 3
1	279.7	327.8
2	271.7	320.6
3	272.7	316.4
Mean		

Number of blocks

	<u>Experiment 2</u>		
	A	B	A'
1	2.0	1.6	2.1
2	2.3	1.6	2.3
3	1.6	0.9	1.3
4	1.7	1.2	1.2
5	1.4	0.8	1.0
Mean			

Number of syllable outputs Experiment 2

	A	B	A'
1	273.9	268.0	283.1
2	326.0	319.0	278.8
3	296.2	306.6	311.9
4	298.1	278.0	285.9
5	279.6	267.2	287.9
Mean			

TABLE-E

Number of blocks per minute in spontaneous speech

	Experiment 1	Experiment 3
1	6.6	7.4
2	6.3	5.9
3	6.2	5.1
Mean		

Number of blocks per minute in Reading

	Experiment 1	Experiment 3
1	6.4	6.5
2	6.2	4.3
3	6.2	1.9
Mean		

Number of syllable outputs in spontaneous speech

	Experiment 1	Experiment 3
1	115.5	131.4
2	111.3	124.1
3	110.1	115.6
Mean		

Number of syllable outputs in Reading

	Experiment 1	Experiment 3
1	172.1	276.8
2	169.0	261.5
3	164.7	250.4
Mean		

Number of blocks:

Experiment 2:

	A	B	A'
1	4.8	4.9	6.3
2	4.0	2.9	4.7
3	3.2	2.4	3.9
4	2.6	1.6	3.1
5	1.6	1.3	2.4
Mean			

Number of syllable outputs

Experiment 2:

	A	B	A'
1	201.5	24.14	171.3
2	223.1	236.1	239.6
3	201.9	275.3	22.40
4	243.7	163.4	265.4
5	256.0	305.8	323.8

TABLE-F

Number of blocks per minute in spontaneous speech

	Experiment 1	Experiment 3
1A	8.6	5.2
2B	8.4	4.3
3	8.2	4.0
Mean		

Number of blocks per minute in Reading:

	Experiment 1	Experiment 3
1	3.4	2.1
2	3.1	2.4
3	3.2	2.1
Mean		

Number of syllable outputs in spontaneous speech:

	Experiment 1	Experiment 3
1	151.3	180.2
2	144.2	178.4
3	141.0	172.9
Mean		

Number of syllable outputs in Reading:

	Experiment 1	Experiment 3
1	210.9	224.7
2	204.3	221.4
3	208.3	218.7
Mean		

Number of blocks:

Experiment 2:

	A	B	A'
1	9.0	7.1	9.0
2	9.5	4.7	5.6
3	8.5	5.7	5.9
4	4.3	2.6	2.5
5	5.0	2.9	4.5
Mean			

Number of syllable outputs

Experiment 2:

	A	B	C
1	121.8	139.2	139.8
2	117.1	128.2	155.3
3	134.6	133.7	135.7
4	113.5	126.3	116.1
5	123	168.9	178.1
Mean			