Howell

A Study into the Predictors for Stuttering:

Investigating the EXPLAN Model

and

Language-Based Theories.
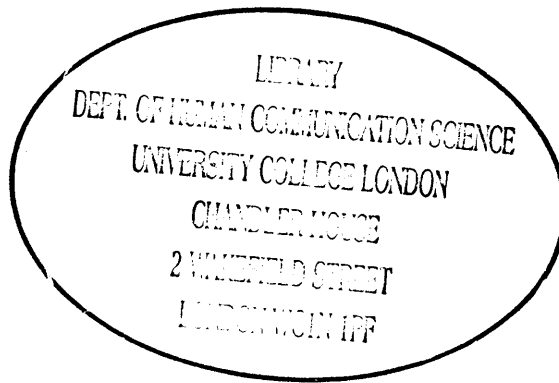
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Abstract

Spontaneous speech samples from children at different ages who have either persisted in stuttering or recovered were analysed. The first part of the study considered the validity of the EXPLAN model proposed by Howell (2004) by replicating previous work. The findings were mainly in agreement with previous studies. However, the findings suggest a possible development change in stuttering behaviour around age 10-12 years which is not accounted for in the current stalling/advancing part of EXPLAN. The relationship between grammatical type and fluency is uncertain in children. To further elucidate this relationship parts two, three and four examined a variety of approaches as to what linguistic factors might predict fluency. The conclusion emphasizes the need to consider an integrated approach to the study of developmental stuttering, including EXPLAN and language-based theories. Further research into dysfluency should include specific grammatical word types such as numerals as well as an investigation into whether dysfluency on a function word affects the following content word.

Introduction

Since 1998, October 22 has been designated International Stuttering Awareness Day in order to raise public awareness of the disorder of stuttering. Stuttering, or stammering[1] as it is also termed, is a disorder of fluency characterised by various behaviours which interfere with the forward flow of speech. These behaviours include overt features such as whole and/or part word repetitions, prolongations, and blocking which may be combined with secondary behaviours such as eye blinks, head nods and other escape behaviours (Guitar, 2006). Covert symptoms such as substitution or avoidance of difficult words or avoidance of specific communication situations may develop over time and are used as coping strategies by the person who stutters.

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[1] The two terms are used interchangeably. 'Stammering' is the term used more frequently in the U.K., while 'stuttering' is predominantly used in the U.S.

While all individuals are dysfluent to some extent, the frequency and severity of the dysfluency sets the person who stutters apart from a person with normal dysfluency. In the past, portrayals of people who stutter have been rather superficial and have focused mainly on the overt features ignoring the negative emotions of fear, anxiety and loss of control which often accompany the disorder. Public knowledge is often limited as to the negative impact of stuttering upon areas such as mental health, social interaction, education and employment which can affect an individual (RCSLT, 2006). Awareness days, and research aid in raising the profile of the disorder, as does the inclusion of affected individuals in the media, as has been seen recently with Tourette Syndrome.

Stuttering can be either developmental or acquired. While acquired stuttering may be associated with a specific event, either neurogenic, pharmacological, psychogenic or physiological, e.g. cerebral vascular infarction (CVA) (RCSLT, 2005), the cause of developmental stuttering is yet unknown although research in the area is rife. While most researchers agree that developmental stuttering is multidimensional and caused by an interaction of individual predisposing factors such as social, linguistic and psychological factors together with an individual's environment (e.g. Shapiro, 1999; Guitar, 1998) there is a group of researchers who believe that multifactorial theories of early stuttering are wrong both from empirical and logical perspectives and that no more than one theory, if any, can be correct (e.g. Onslow, 2006). Evidence for a genetic basis for stuttering is increasing and current research suggests that genetics are involved in around fifty percent of cases (Yairi, 2005).

Andrews et al. (1983) studied prevalence and found that at any given time around one percent of school children are stuttering and various studies have recorded an incidence of five percent in school aged children (e.g. Mansson, 2000). These figures are widely accepted. Although there are no accurate recordings of the number of adults who stutter, it is suggested that stuttering rates decrease after puberty to less than one percent in the adult population (Bloodstein, 1987; Andrews et al., 1983). This difference between prevalence and incidence suggests that stuttering can be either transient or persistent. Current research suggests that of the 5 percent of children who stutter one third will resolve within 18 months and the remaining third will resolve within three years post-onset (Ambrose & Yairi, 1999).

A range of factors are thought to be related to persistence of stuttering: gender (females more likely to recover), family history of persistent stuttering, additional speech and language problems, length of time since onset and stuttering that is episodic is more likely to resolve (Yairi et al., 1996; Ambrose, Cox, and Yairi, 1997; Yairi, and Ambrose, 1999). Persistence is not related to the type or severity of stuttering at onset.

While stuttering research is exploring ways to improve the diagnosis and treatment of stuttering and its causes, the main emphasis is being placed on developing ways of identifying those children who will recover spontaneously and those who will persist in stuttering if left untreated. In particular, those treating children who stutter, the speech and language therapists, are faced with a dilemma when a young child enters their clinic and presents with a stutter. Currently, debate surrounds the amount of time and resources that should be put into providing therapy to a group of clients where around two thirds will recover unaided (e.g. Roberta Lees, 2003). It is not only a question of offering a cost effective service but also an ethical issue regarding the correctness of entering a child into therapy and focusing their attention on the dysfluent speech when this may not be an area of worry for the child. Rather than helping the child, the therapist may worsen a problem which would otherwise have resolved itself and cause the parents to experience increased anxiety which will affect their interaction with their child negatively.

Onset of stuttering is most likely to occur between the ages of two and five years (Andrews et al., 1983), the fourth year being the most likely (Haege, 1995) which is a period of intense speech and language acquisition for a young child, and the development of syntax. Eighteen months is the earliest time that stuttering is reported (Bloodstein, 1995) and this time coincides with grammatical development and the combining of words to express meaning. This incipient stuttering, that is stuttering in very young children, is characterised by repetitions of single syllable words in sentence-initial positions and part-word repetitions occurring on pronouns and conjunctions rather than on nouns, verbs, adjectives or adverbs (Guitar, 2006; Bloodstein, 1995; Bloodstein and Gantwerk, 1967). The spatial location of stuttering, at the beginning of utterances or syntactic constituents and at the beginning of words, have led researchers to hypothesise an involvement of linguistic planning and

preparation at this early stage of stuttering (Bernstein Ratner, 1997; Bloodstein, 2006).

Specific linguistic factors have been proposed to play a role in stuttering in adults such as Brown's factors (1945). He found that dysfluency is more likely to occur on content words that start with a consonant, are long and are produced at the beginning of a sentence. Research with children found support only for the word-length effect as a predictor for stuttering (Dworzynski, Howell, and Natke, 2003).

While some researchers, such as Bloodstein, propose that stuttering is purely a language disorder, other researchers maintain that the problem is neurological affecting the planning, organisation and initiation of movements, including speech (e.g. Webster, 1995). Speech is a rapid process, the average person produces around 167 words per minute (Darley, 1940). In comparison, the average person types only around 40 words per minute. Although our hands are generally considered to be invaluable diverse tools with the ability to carry out very fine motor tasks, the speed and precision at which our articulators work is truly astounding and it is surprising that we do not make more errors than we do. Errors including slips of the tongue and Spoonerisms, e.g. "can I sew you another sheet" (can I show you another seat), are examples of how we all make errors when the motor execution and language processing mechanisms are out of synchrony. In Spoonerisms it appears that the brain is rushing ahead of the articulators and plans laid down regarding what we are going to say interferes with what we are saying at the moment. A current view of stuttering suggests that the opposite may be happening in stuttering where the articulators are forced to backtrack and repeat a word that has already been said because the plan for the next word has not yet been prepared and is not ready to be executed. The EXPLAN model proposed by Howell and Au-Yeung, in 2002, maintains that linguistic planning and motor programming and execution are independent processes which must function synchronously in order for speech to be fluent. The acronyms in the model originates from these two terms, execution and planning, and suggests that linguistic processes work in parallel with motor processes to generate a plan and execute it.

At the core of this model is the differentiation between function words and content words. Function words comprise a closed class of words that have little lexical

meaning but do express grammatical relationships with other words. Function words are often short and used frequently. Function words include determiners, articles, pronouns, prepositions, conjunctions, auxiliary verbs and modal verbs. Content words, in comparison, comprise an open class of words with new words constantly being added and include nouns, verbs, adjectives, adverbs and interjections. The semantic content of sentences is borne mostly by nouns which are of pivotal importance in English and along with verbs they are a dominant part of speech (Algeo, 1995). In order to formulate their theory of stuttering, Howell and Au-Yeung segmented speech into units known as phonological words. Historically, the term 'phonological word'[2] was introduced by Dixon in 1977 (cited in Hall and Kleinhenz, 1999) and Selkirk (1984), was one of the first linguists to use the concept in her analyses. A phonological word, PW, consists of a single content word, which is the nucleus, and which can be surrounded by optional function words either preceding or following the nucleus. The phrase 'I woke up', is a single PW with 'woke' as the nucleus and one function word (pronoun 'I') preceding the nucleus and one following it (preposition 'up'). In theory a PW can have any number of initial and final function words though this is limited to a small number in practice.

Howell et al. proposed that there are two basic patterns of stuttering within a PW, either dysfluency on the function word preceding the content word, e.g. "He he he fell over" or dysfluency on the content word, e.g. "He fffffffell over". While the first type of dysfluency is often seen in normally-dysfluent children (Clark & Clark, 1977), the second type of dysfluency rarely occurs in normally-dysfluent children (Howell, Au-Yeung & Sackin, 1999). Importantly, stuttering on function words which follow the content word, e.g. "he fell over over", is rarely seen in either dysfluent children or normally-dysfluent children (Au-Yeung, Howell & Pilgrim, 1998). According to EXPLAN this is because stuttering, whether it occurs on the function word or the content word, results from a difficulty in producing the content word. This may explain why a function word following a content word in a PW is rarely stuttered – the difficult word has already been produced. Hence, Howell et al. put forward an argument that stuttering of function words before their content word in PWs in young

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[2] 'Phonological word' is also known as 'prosodic word'.
may surround the content word.

speakers is used as a delaying tactic, what they term as 'stalling', when the forthcoming content word is not prepared for articulation. Johnson et al. (1959) compiled a list of eight types of stuttering events which the researcher fitted into two categories based on their visible features. Stalling dysfluencies included whole word repetitions, phrase repetitions, and interjections which include filled or silent pauses. In this category, complete words are produced or pauses occur which allow extra time before the next item is produced. Observation of the second category of words, however, reveals that only the initial part of the word is produced. This is taken to indicate that the full plan is not available to the speaker. They termed this type of dysfluency behaviour, advancing, which includes part-word repetitions, prolongations, abandonment, revisions and within-word breaks, also known as blocks. In conclusion, stalling dysfluencies occur on function words to delay the execution of an unfinished plan for a content word, while advancing dysfluencies occur on content words when only part of the plan for that word is ready.

In addition to these findings, Howell et al., highlighted the dynamic nature of stuttering by showing that the proportion of function word to content word dysfluencies changes across ages for individuals who persist in stuttering. Such children and adults will start to attempt the content word when it is only partly prepared for execution rather than stall which will cause them to stutter on the content word. The content word dysfluency appears to be firmly established by age 10-12 for children who will persist in stuttering (Howell, Au-Yeung, Charles, Davis, Thomas, Reed, Sackin & Williams, 2000).

The importance of function words and content words is apparent in other language disorders such as agrammatism following a CVA. Agrammatism is a term used to describe the disordered speech produced by people following damage to a part of the brain often called Broca's area. This type of diffuse brain damage can often be seen after a stroke following which the person has aphasia. This type of aphasia is characterised by decreased verbal output, increased effort in speaking and agrammatic speech (Love & Webb, 2001). Agrammatic speech, or telegraphic speech, features the reduction or omission of certain vocabulary elements such as function words and inflectional morphemes (Caplan, 1985) although content words, particularly nouns,

may be produced frequently. The telegraphic nature of the verbal output may be increased by frequent pausing and word finding difficulties.

An explanation for the loss of function words in agrammatism may be found within the EXPLAN model. The diffuse damage to the brain caused by the CVA may result in a masking effect at the neural level (Howell, in press). Function words are few and are uttered frequently which means that they may require only a small amount of neural activation in order to be produced. Content words, however, are larger in quantity and uttered infrequently which will require a higher level of neural activation to result in production. The masking effect which is acting at the neural level may therefore act like a cloud covering in a mountain range allowing only words with high activation levels to protrude like peaks through the clouds and be uttered. Hence function words are more likely to be lost and content words retained resulting in agrammatic speech.

Stuttering has been shown to be a dynamic disorder which tends to become more complex over time as an individual's response to it changes and coping strategies start to interfere with lifestyle and tension and covert features increase. The stutter itself appears to change too with a shift from stalling to advancing dysfluencies in those that persist. The reply to a dynamic disorder should be dynamic research which crosses boundaries between disorders and disciplines. Ongoing cross-linguistic research promises to provide valuable information regarding the linguistic factors involved in stuttering (e.g. Au-Yeung, Vallejo Gomez & Howell, 2003; Dworzynski, Howell, Au-Yeung & Rommel, 2004) while cross-disciplinary research into identifying genes underlying stuttering is progressing (e.g. Ambrose, Cox &Yairi, 1997).

The present study aimed to investigate further the claims made by the EXPLAN model by analysing the occurrence of stalling and advancing dysfluencies and the proposed exchange that happens between the two types of behaviours across ages. Researchers, such as Onslow, make an important point when they state that theories are critical but need careful scrutiny because if a theory is wrong, the resulting therapy may also be wrong. Hence, the validity of the EXPLAN model and its use of the PW unit as a predictor of stuttering loci is tested here. In particular, the model is compared with a syntactic hypothesis which proposes that stuttering is affected by syntactic boundaries rather than PW boundaries. A range of different structures are examined

with regards to loci of stuttering, differences between persistent and recovered groups and between ages. Firstly, final NP phrases are examined with regards to the effect of PWs on stuttering rates. Certain syntactic structures such as canonical word order and the sub-sequences which can occur in this linear structure have been shown to be important in language disorders such as agrammatism (Caplan, 1985) and it is investigated here whether such sequences may be important in predicting dysfluency. Finally, while Brown identified linguistic factors to predict stuttering in adults, the evidence for children is still unclear. Hence, the occurrence of specific function word sequences before content words and their differential involvement in dysfluencies is investigated here. The PW hypothesis would predict that the number of function words in the prior sequence but not the grammatical types in the sequence should affect dysfluency rate. The syntactic hypothesis, however, predicts that they should. Hence, the main concern of the present study is why dysfluency occurs on certain words, and in particular the degree to which linguistic and motor factors affect dysfluency.

Methodology

1. Participants

Three individuals, with English as their first language, participated in the present study. Initially, screening procedures were carried out by a speech and language therapist at a specialist clinic to establish that each child was stuttering. The stuttering was then assessed using the Stuttering Severity Instrument SSI-3 (Riley, 1994) and an appropriate plan of intervention was implemented. Reassessment at age 12 revealed that their stutter had persisted.

The data collected was longitudinal and recordings made at two separate ages were included for each participant: (Child 1) 8 years 10 months and 15 years 4 months; (Child 2) 10 years 2 months and 18 years; and (Child 3) 10 years 10 months and 15 years 7 months. All three participants were male. A total of six data files were used.

1.1. Additional data

The data collected for this study were added to data recently collected by a colleague, Sharif (2006), in order to carry out appropriate analyses. The numerical data of the frequencies of occurrences was employed. Previously, this researcher was unable to investigate all her hypotheses due to limited occurrences of certain features within her body of data. Every effort had been made to ensure that reliability had been maintained in rating and analysing the samples through personal communication with the researcher. It is felt that more information was gained through combining the two sets of data because more detailed age and stutter type comparisons between the persistent and recovered group could be performed

The additional data were obtained from sixteen individuals; eight of whom recovered from stuttering and eight who persisted. Recordings were made at three different ages: 8-10, 10-12, and more than 12 years old. A total of 48 data files were obtained from this group which in addition to the other six files gives a total of 54 data files. The participants were divided into three age groups (1) 8-10 years, (2) 10-12 years, and (3) 12+ years in order to carry out age comparisons.

2. Speech Material

Computer files containing transcriptions of spontaneous speech samples of durations varying from 2 minutes 22 seconds to 4 minutes 20 seconds (average: 2 mins 40 secs) were obtained from the Speech Team at the UCL Psychology Department. The recordings contained self-formulated monologues (describing a favourite computer game, the trip to the clinic this morning, a favourite football team etc.) and consisted mainly of the individuals speaking about topics familiar to them with minimal prompts from the researcher.

3. Transcription

The Speech Filing System (SFS) software, developed by Mark Huckvale at UCL, was used to analyse the data. Initially, the data were annotated orthographically and all words were classified as either function or content words, and coded as either fluent or dysfluent. PW boundaries were marked and stuttering episodes were noted, based on Johnson et al.'s stuttering events. These events allowed stalling and advancing dysfluencies to be differentiated (the events making up these classes are indicated next):

Stalling dysfluencies:	Advancing dysfluencies:
1. silent pauses	4. Part word repetitions
2. filled pauses	5. Prolongations
3. whole word repetitions	6. Within word breaks
	7. Revision/abandonment

A separate category (8) dysfluency on the final function word in a PW was included in this analysis to investigate the stalling strategy further. Johnson et al.'s 'idea abandonment' and 'phrase revision' were collapsed into one category because they both involve PWs which are not complete and are problematic to consider as dysfluencies. Interjections such as 'erm' were excluded from the analysis as were untranscribable utterances which made up an average of three utterances per participant.

Part 1

The majority of the claims regarding stalling and advancing dysfluencies made by the EXPLAN model were tested in this part of the study across ages and groups of persistent and recovered stutterers. The following claims were tested:

1. The complimentarity of function and content words, which is the basis of the EXPLAN model, predicts that if dysfluency occurs on an initial function word in a PW, i.e. the one preceding the content word, dysfluency will not occur on the following content word. Stalling dysfluency should prevent advancing dysfluency (Howell et al., 1999).

2. As the model states that the purpose of stalling dysfluencies is to delay the production of an unavailable content word, the prediction follows that there should be few or no dysfluencies on function words following a content word within a PW.

3. Advancing dysfluencies should occur more frequently on content words as a result of an unfinished plan being executed.

4. Stalling dysfluencies should occur more frequently on function words as a delaying tactics while the following content word is planned and executed.

5. Howell et al. (1999) state that function word stuttering should decrease for both persistent and recovering groups as the individuals get older. For the persistent group there should be an increase in content word stuttering as advancing dysfluency replaces stalling. This effect should be evident by age 10-12 years (Howell et al., 2000).

1.1. Method

The speech samples were segmented into PWs as described by Au-Yeung et al. (1998). The EXPLAN model states that only PWs with function words in pre-content word positions can be implemented for stalling. Hence, PWs without a function word preceding the content word were excluded from this analysis. Each word was then coded as either fluent or dysfluent and the type of dysfluency behaviour was noted. All dysfluencies occurring on a single word were noted. For instance, a silent pause may occur prior to a word which is then also repeated twice hereby producing two

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dysfluencies on the same word. Previously, such multiple dysfluencies have been ignored and the word coded simply as dysfluent. It is argued here that all dysfluencies provide information about the process which underlies production of words and should be included in the analyses. One type of dysfluent event, (7) revision/abandonment, was excluded from the statistical analyses because there were too few cases although observations of occurrences were made. Some samples contained none of these events while others contained up to three.

1.2. Results

1.2.1. Present data

The sample contained 941 PWs of which 467 PWs started with a function word (49.6%) and were analysed here. Of the 467 PWs 60% were produced fluently while 82.5% of PWs starting with a content word were produced fluently.

Individual stuttering rates were calculated by dividing the number of stuttered words by the total number of words. Overall stuttering rates ranged from 11.2 to 32.2 % with an average of 18.3%. Individual stuttering rates for the two word types were calculated. The percentage of stuttering on function words ranged from 10.3 to 23% with an average stuttering rate of 16.9%. For content words the stuttering rate ranged from 8.3 to 41% with an average of 18.8 %.

Table 1. Stuttering rates and percentages across two age groups, young and old, for the three participants in the present study.

	Overall		Function words		Content words	
	Young	Old	Young	Old	Young	Old
Participant 1	19.4%	19.4%	23%	16%	16.3%	21.5%
Participant 2	32.2%	11.4%	23%	11.3%	40.9%	11.4%
Participant 3	16.3%	11.2%	18.3%	10.3%	14%	8.3%

1.2.1.1. Complimentarity

In the complete sample of 941 PWs, there were five instances of lack of complimentarity. In these cases, the content word was produced dysfluently although stalling dysfluency had occurred on the preceding function word. These occurrences make up a percentage of 0.53%.

1.2.2. Combined Data

Sharif's data were included for the following analyses.

1.2.2.1. Dysfluency on function words following content words.

Dysfluency of any function words following the content word in the PW were tallied and the total was six for the persistent group, four of which were by the same individual, and seven for the recovered group. For the persistent group that is 0.44% of dysfluencies and for the recovered group it is 0.83% of dysfluencies.

1.2.2.2. Stalling and Advancing dysfluencies

The distribution of the two types of dysfluency behaviours on function and content words was examined for the three age groups and the groups of persistent and recovered children. Two separate analyses were done because Sharif's data contained what appeared to be a disproportionate amount of prolongations compared to the present data set. In order to account for any effects of the amount of prolongations and any possible outliers they were included in one analysis, advancing$_{prolong}$, and excluded in the second analysis, advancing$_{noprolong}$.

Chi-square analyses were carried out for each age group in the persistent and recovered groups to examine the association between word type, function word and content word, and dysfluency behaviour, advancing and stalling. The results for the two data sets are displayed in table 2.

Table 2. Significance levels for the associations between word type and dysfluency behaviour for the persistent and recovered group across the two types of advancing.

	Advancing$_{prolong}$	Advancing$_{noprolong}$
Persistent 8-10 yrs	$p < 0.001$	$p < 0.001$
Persistent 10-12 yrs	$p < 0.001$	$p < 0.001$
Persistent 12+ yrs	$p < 0.05$	$p = 0.267$
Recovered 8-10 yrs	$p < 0.005$	$p = 0.287$
Recovered 10-12 yrs	$p < 0.03$	$p < 0.05$
Recovered 12+ yrs	$p = 0.584$	$p = 0.130$

The results indicate that there is an association between word type and dyfluency behaviour for the three groups in the persistent group with 8-10 years and 10-12 years reaching the 1% significance level and 12+ years reaching the 5% significance level. For the recovered group, 8-10 years reaches the 1% significance level, while 10-12 years reaches the 5% significance level. For 12+ years, when recovery would have happened, no association was found between word type and dysfluency behaviour.

1.2.2.3. Dysfluency Behaviour Exchange

A multivariate analysis of variance, MANOVA, was carried out to test the main effects of the independent variables, age group, persistent/recovered group and word type and to determine whether there were any interactions among the independent variables. The analyses were again carried out separately for advancing$_{prolong}$ and advancing$_{noprolong}$.

Similar results and the same significance levels were obtained for advancing$_{prolong}$ and advancing$_{noprolong}$ so the values for the analysis including the prolongations will be reported here. Wilk's Lambda indicates that there was a significant effect of group (F = 4.82, p<0.001) and of word type (F = 13.96, p<0.001) but no effect of age. No interaction effects were found.

In order to determine which variables affected the results figures were produced for each type of dysfluency behaviour. Figures 1-6 illustrate the change in frequency of the six dysfluency behaviours across ages for the persistent and the recovered groups.

Silent Pause

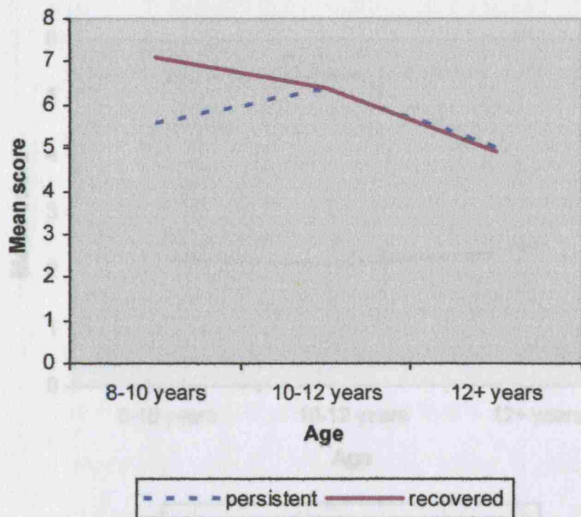**Figure 1.** Mean score for silent pauses across the three age groups and the two groups, persistent and recovered.

Filled Pause
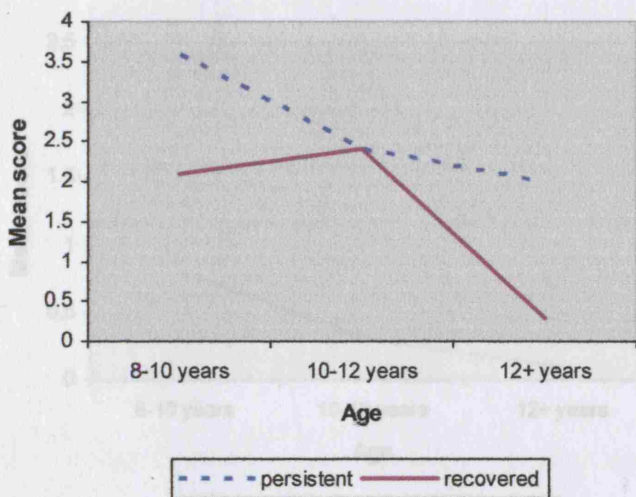
Figure 2. Mean score for filled pauses across the three age groups and the two groups, persistent and recovered.

Word repetitions

Figure 3. Mean score for word repetitions across the three age groups and the two groups, persistent and recovered.

Prolongations

Mean score (y-axis: 0, 1, 2, 3, 4, 5, 6)

Age (x-axis: 8-10 years, 10-12 years, 12+ years)

- - - persistent ——— recovered

Figure 4. Mean score for prolongations across the three age groups and the two groups, persistent and recovered.

Within word breaks

Mean score (y-axis: 0, 0.5, 1, 1.5, 2, 2.5)

Age (x-axis: 8-10 years, 10-12 years, 12+ years)

- - - persistent ——— recovered
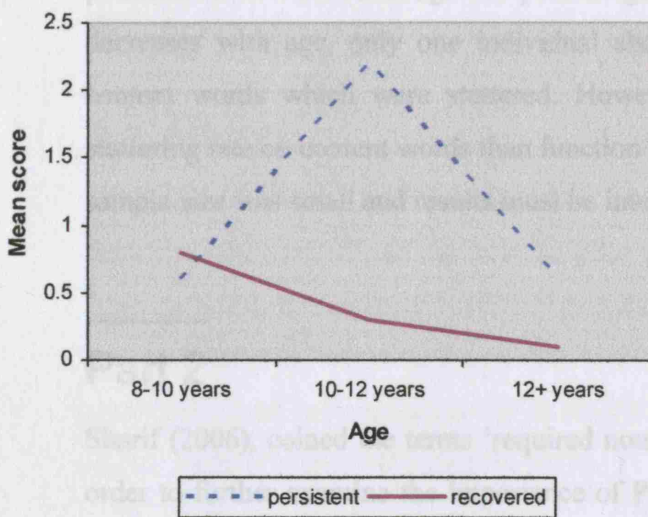
Figure 5. Mean score for within word breaks across the three age groups and the two groups, persistent and recovered.

Part word repetitions

Mean score (y-axis: 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5)

Age (x-axis: 8-10 years, 10-12 years, 12+ years)

- - - persistent ——— recovered

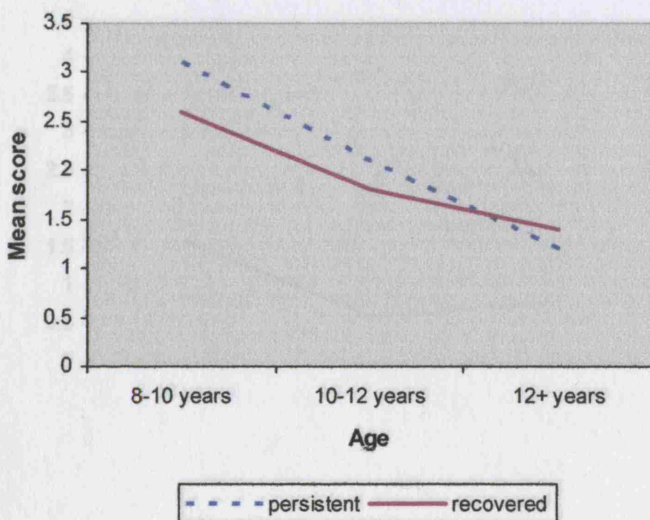**Figure 6.** Mean score for part word repetitions across the three age groups and the two groups, persistent and recovered.

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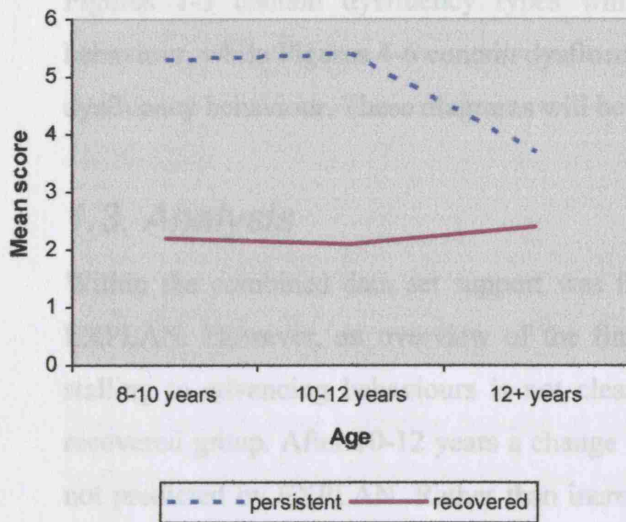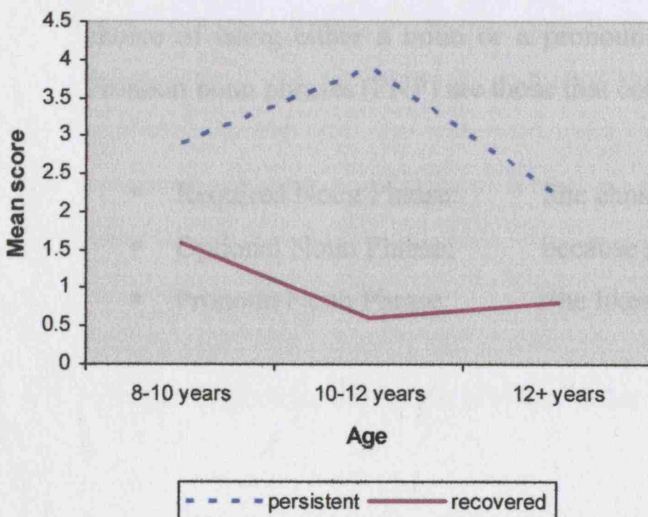Figures 1-3 contain dysfluency types which belong to the stalling dysfluency behaviour, while Figures 4-6 contain dysfluency types which belong to the advancing dysfluency behaviour. These diagrams will be discussed further later.

1.3. Analysis

Within the combined data set support was found for the stalling/advancing part of EXPLAN. However, an overview of the findings suggests that the transition from stalling to advancing behaviours is not clear-cut neither for the persistent nor the recovered group. After 10-12 years a change in advancing behaviour occurs which is not predicted by EXPLAN. Rather than increasing in the persistent group advancing behaviours decrease after this age while there is a slight increase in the recovered group. The present data indicates that overall stuttering rate decreases with age for persistent stutterers. Although the percentage of function words which are stuttered decreases with age, only one individual showed an increase in the percentage of content words which were stuttered. However, two individuals showed a higher stuttering rate on content words than function words in the older category. The current sample size was small and results must be interpreted cautiously.

Part 2

Sharif (2006), coined the terms 'required noun phrase' and 'optional noun phrase' in order to further examine the importance of PWs in stuttering. Required noun phrase (RNP) refers to a noun phrase where context dictates that the noun phrase must consist of noun, with or without a determiner, but not a pronoun, e.g. the first time a person's name is mentioned. Optional noun phrases (OPN) presents the speaker with a choice of using either a noun or a pronoun as they are both syntactically correct. Pronoun noun phrases (PNP) are those that contain a pronoun.

- Required Noun Phrase: She chose $_{RNP}$[Jim]
- Optional Noun Phrase: because she liked $_{ONP}$[the man] / $_{ONP}$[him]
- Pronoun Noun Phrase: She liked $_{PNP}$[him]

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Within an utterance, the choice of noun phrase used will have an impact upon the number of PWs and hence the opportunities for stuttering. An utterance containing a RNP, such as "he kissed the girl" contains two PWs, while the PNP "he kissed her" contains one.

- He kissed the girl   = $_{PW}$[he kissed] $_{PW}$[the girl]
- He kissed her   = $_{PW}$[he kissed her]

Both utterances have syntactic boundaries after 'kissed', but if PWs are involved in stuttering, RNPs and ONPs provide the speaker with two function words in pre-content word positions and two content words upon which stuttering could occur, while PNPs contain only one content word and one function word preceding it. According to the EXPLAN model, stuttering should not occur on the pronoun in the PNP as its position is post-content word and can therefore not be used for stalling.

2.1. Method

Final object pronouns and final object noun phrases were located within the samples, their frequency tallied and the position of dysfluency noted, whether it occurred on a function word or a content word. It was hypothesised that stuttering would occur on the two function words 'he' and 'the' in RNPs and ONPs, while function word stuttering would only occur on 'he' in the PNPs. Therefore, stuttering rates should be higher for RNPs and ONPs than for PNPs.

2.2. Results

There was insufficient data to carry out age comparisons for the different phrase types so the data was collapsed across ages for the two groups, persistent and recovered. Inspection of the tables below indicates that the persistent group produced more stuttered phrases than the recovered group did. Also, a higher percentage of their produced phrases were dysfluent across all three phrase types. The results are most apparent for the RNPs although this may in part be due to the large number of frequencies. With the inclusion of Sharif's (2006) data there was enough cases to do a cross-group comparison A chi square test was performed on the data below to test whether an association exists between group and fluency. There was an association

between phrase type and fluency (X^2=20.01, df=2, p<0.001) for the persistent group but no association for the recovered group.

Table 3. Frequency data and percentages for fluency on the three phrase types for the persistent and recovered group.

	Persistent				Recovered			
	Fluent		**Dysfluent**		**Fluent**		**Dysfluent**	
	Freq	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*
RNP	21	24 %	68	76 %	59	58 %	42	42 %
ONP	22	59 %	15	41 %	13	65 %	7	35 %
PNP	14	61 %	9	39 %	6	75 %	2	25 %

RNP=Required noun phrase; ONP=Optional noun phrase; PNP=Pronoun noun phrase

The persistent group had more dysfluency on both types of words, particularly for the RNPs.

Table 4. Frequency data and percentages for fluency on the two word types occurring in the different phrases for the two groups.

	Persistent				Recovered			
	Dysfluent		**Percentage**		**Dysfluent**		**Percentage**	
	FW	*CW*	*FW*	*CW*	*FW*	*CW*	*FW*	*CW*
RNP	42	46	48 %	52 %	23	21	52 %	48 %
ONP	7	15	32 %	68 %	6	6	50 %	50 %
PNP	6	3	67 %	33 %	0	2	0 %	100 %

RNP=Required noun phrase; ONP=Optional noun phrase; PNP=Pronoun noun phrase; FW=Function word; CW=Content word

2.3. Analysis

The high incidence of RNP phrases and few ONP and PNP phrases in the study makes interpretation of the results difficult and any conclusions drawn must be tentative. Support was found for the importance of PWs in predicting stuttering. This support was provided by the high percentage of dyfluency on the RNP phrases in the persistent group but not in the recovered group and the relatively low percentage of

dysfluency on the PNP phrases. For the persistent group, the higher rate of dysfluency on content words in RNPs could be due to the increased number of content words in these phrases. However, it may also suggest that only one function word is available for stalling in PNPs while the two PWs in RNPs provide two opportunities for stalling. Further investigation is needed to determine this.

Part 3

Caplan (1985) found that individuals with agrammatism produce mainly syntactic structures with an underlying canonical word order. English is deemed to be a canonical language with an S-V-O word order where the Subject is followed by the Verb which is followed by the Object (Love & Swinney, 1998). As these individuals produce mainly content words, most of their output consisted of sequences of the string N-V-N and sub-sequences N-V and V-N. Caplan argued that production of N-N sequences are also common, either as a result of perseveration or as a method of relaying a possessive relation between the two nouns. However, sequences with a verb following another verb, V-V, are rarely found in agrammatic speech, except when they are part of separate syntactic structures, e.g. when a N-V sequence is produced before a V-N sequence.

It can be argued that if dysfluencies are affected by syntactic organisation, rather than by PWs, then differences would be expected between those sequences of content words that can occur within the same syntactic constituent (N-V, V-N, N-N) versus those that occur between different syntactic constituents (V-V). The PW hypothesis states that there should be no difference between these as all content words belong to separate PWs. According to the syntactic hypothesis, it would be expected that V-V should lead to more dysfluencies on preceding function words and on the content words themselves as the two Vs straddle different major syntactic constituents.

3.1. Method

All words within the collapsed speech sample had been classified as either function or content words. For the purpose of this analysis, the content word category was expanded in order to include lexical words which may operate as either content words

or function words but that are actually verbs, i.e. the modal and auxiliary verbs. For each speech file, each content word was coded as either noun or verb, and the complete sequence of these words was transcribed. By sliding along the transcription, each sequence of two content words following each other was classified as NN, NV, VN or VV and each sequence was coded depending on which word was fluent and which was dysfluent. This coding system was used: fluent (FF), partly dysfluent (FD) or (DF), or dysfluent (DD). An example would be:

- The boy ki-kicked the fffffffffootball through the big window
  N   V   N   N   N
- Word sequence: NV – VN – NN – NN
- Fluency sequence: FD – DD – DF – FF

The frequency of each of the four word sequences was then tallied and the results were analysed.

3.1.1. Utterances

Only the present data were available for additional analysis with regards to utterances. The syntactic hypothesis hypothesises that any sequence which crosses utterance boundaries may show an increased rate of dysfluency because each word belongs to a separate syntactic constituent. EXPLAN, on the other hand, hypothesises that there will be no difference in dysfluency between sequences that cross utterances or those that do not because they both belong to different PWs.

The term 'utterance' does not have a precise linguistic definition. Phonetically it is a unit of speech bounded by silences such as a breath or a pause. In dialogue, each turn by a speaker may be considered an utterance. In the present study, however, the data is in the form of monologues and silences may occur due to dysfluencies rather than prosody. Hence, the definition of an utterance here has been based partly on what Crystal (1975) terms 'terminal intonation' which allows discrimination of separate utterances at a perceptive level. Human perception is highly sensitive to voluntary variation of the fundamental frequency ('t Hart, Collier & Cohen, 1990). Furthermore, the parsing of utterances is also based on the content of the utterance and grammatical cues such as conjunctions. This method is by no means flawless and residual

problems do remain such as subjective interpretation of intonation and grammatical cues. An objective definition is still needed for the unit we call 'utterance'.

3.2. Results

The average frequency with which each type of sequence was produced was calculated for the persistent and the recovered group. The results were collapsed across the ages as they were very similar and the same pattern was evident for each age group. Within the persistent group the average distribution was as follows: 39.7% N-Ns, 22.3% N-Vs, 22.3% V-Ns, and 15% VVs. For the recovered group the results were: 49.3% N-Ns, 20% N-Vs, 22% V-Ns, and 8% V-Vs. The frequency of each word sequence being produced fluently or dysfluently is shown in Table 5 for the persistent group and in Table 6 for the recovered group. The persistent group showed least dysfluency on the V-V sequence, an average of 26%, and most dysfluency on the V-N sequence, average 40%. The recovered group, on the other hand, showed most dysfluency on the V-V sequence with an average of 20% and least dysfluency on the N-N sequence with a 15% average although this was very similar to the 16% average for V-N and N-V sequences.

Table 5. Frequency of fluency of noun-verb sequences for the three age groups in the persistent group.

	NN		NV		VN		VV	
	Fluent	*Dysfl*	*Fluent*	*Dysfl*	*Fluent*	*Dysfl*	*Fluent*	*Dysfl*
8-10	59 %	41 %	66 %	34 %	57 %	43 %	74 %	26 %
10-12	64 %	36 %	60 %	40 %	59 %	41 %	67 %	33 %
12+	69 %	31 %	74 %	26 %	65 %	35 %	81 %	19 %

A chi-square analysis was carried out on this data to test the association between word sequence and dyfluency for each age group. There was an association between word type and dysfluency (X^2=7.65, df=3, p<0.05) for the persistent 8-10 years group and for the persistent 12+ years group (X^2=12.08, df=3, p<0.01). No association was found for the persistent 10-12 years group or any of the recovered age groups.

Table 6. Frequency of fluency of noun-verb sequences for the three age groups in the recovered group.

	NN		NV		VN		VV	
	Fluent	*Dysfl*	*Fluent*	*Dysfl*	*Fluent*	*Dysfl*	*Fluent*	*Dysfl*
8-10	85 %	15 %	75 %	25 %	82 %	18 %	78 %	22 %
10-12	88 %	12 %	87 %	13 %	88 %	12 %	84 %	16 %
12+	81 %	19 %	90 %	10 %	83 %	17 %	79 %	21 %

The age groups were collapsed across each dysfluency sequence and inspection of Figures 7 and 8 indicate that the persistent group produced more dysfluencies across all word sequences. Both groups produced a majority of fluent (FF) sequences with relatively few dysfluent sequences, the minority of which was the completely dysfluent sequence (DD).
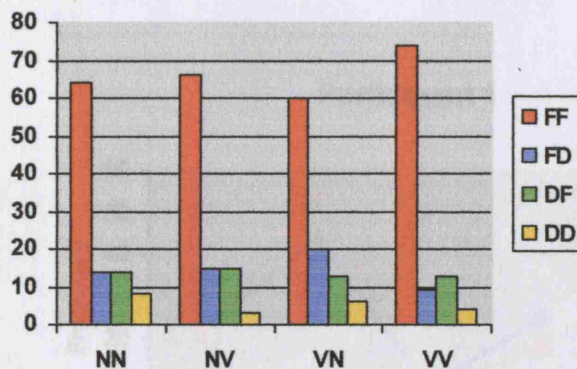
Figure 7. Mean percentages for the word sequences and dysfluency sequences for the persistent group.
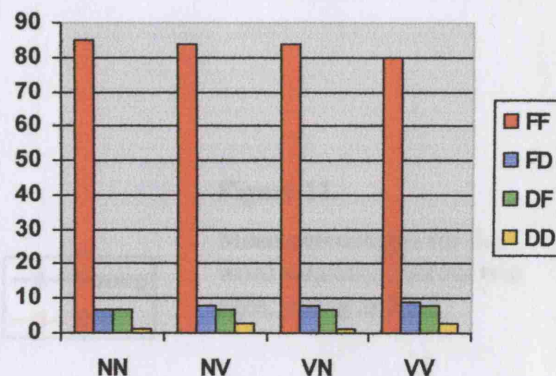
Figure 8. Mean percentages for the word sequences and dysfluency sequences for the recovered group.

3.2.1. Cross-utterances

All the sequences occurring across utterances were tallied for the present data and displayed in Firgure 9. The number of dysfluent sequences produced is shown in Figure 10.

Cross-Utterance Frequency   **Cross-Utterance Dysfluency**

Legend:
- N-N
- N-V
- V-N
- V-V
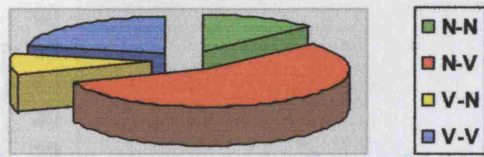
Figure 9. Mean percentages for the word sequences for the persistent group.
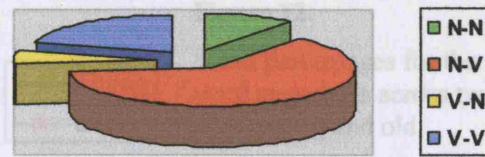
Figure 10. Mean percentages for the word sequences for the recovered group.

There appears to be an equal relationship between the percentage of sequences in the sample and the frequency at which the sequence is stuttered. No sequence appears to produce more stuttering than any other sequence.

In order to investigate any age differences, the mean score for each word sequence was converted into a percentage of the total number of word sequences for each participant and is displayed in Figures 11-13.
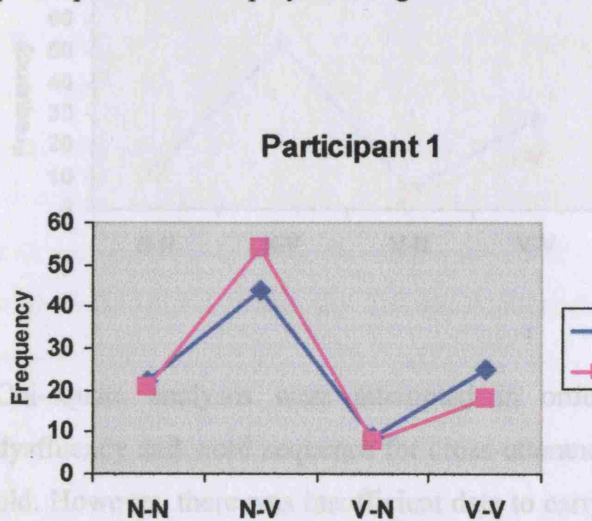
Participant 1

Figure 11.

Mean percentages for the word sequences across two ages, young and old.

The same pattern of sequences occurring across utterances is evident for each participant with little change across age. All three participants show few N-N and V-N sequences, and a disproportionately large percentage of N-V sequences occurring at utterance boundaries.

25

Participant 2

All three participants show the same trend of increasing the percentage of N-V sequences being produced and decreasing the percentage of V-V sequences with increasing age. N-N and V-N percentages, however, remain almost the same.

Participant 3

Chi-square analyses were attempted in order to test the association between dysfluency and word sequence for cross-utterances in the two age groups, young and old. However, there was insufficient data to carry out this analysis. In particular, N-N and V-N sequences occurred infrequently in cross-utterance positions. The data was then collapsed across the two age groups and no association was found.

3.3. Analysis

No significance was found for utterance boundaries in predicting stuttering. The content word sequences, on the other hand, provided interesting results particularly with regards to the V-V sequence. The syntactic hypothesis stated that V-V sequences should produce more dysfluencies because V-Vs often belong to separate syntactic

constituents and pose particular problems to agrammatic speakers. However, persistent speakers produced on average a larger percentage of V-Vs fluently than did recovered speakers. Although this suggests that the syntactic hypothesis may be rejected it is not clear how syntactic constituents interact with the change from stalling to advancing behaviours in persistent stutterers and more research is needed in this area.

Part 4

Howell (in press) presented research by Caramazza and Berndt (1985) which showed a list of function words omitted by agrammatic speakers in order from hard to easy. This list corresponded well with the list of function words stutterers find difficult as provided by Brown (1937). Based on Howell's theory of masking in agrammatism, agrammatic individuals omit the words the speakers who stutter find easiest due to produce due to a gradiation in activation of function words. The lowest levels of activation are needed for articles, auxiliaries and prepositions, which are most commonly lost in agrammatic aphasia, while higher levels of activation are needed for conjunctions and pronouns. PW hypothesis predicts that the number of function words preceding nouns and verbs may be differentially involved in dysfluencies but that their grammatical types do not affect dysfluency rate. The syntactic hypothesis, on the other hand, predicts that the grammatical type of the function words preceding the content word should affect the dysfluency rate.

4.1. Method

In the present data, function words and content words were coded as fluent or dysfluent and content words were divided into nouns or verbs including modal verbs and auxiliary verbs in the verb category as in part 3. The number of words preceding each content word was tallied and the frequency of each number noted. Furthermore, the grammatical type of the function word in the position preceding the content word was noted and the frequency of each word tallied. It was also noted how often a content word preceded another content word and how often it was produced dysfluently.

4.2. Results

The frequencies of each grammatical type of function word preceding either a noun or a verb in PWs and the frequency of dysfluencies are displayed in Table 7. Also included is the frequency with which a content word preceded another content word and how often the second content word was produced dysfluently.

For function words the percentage of dysfluency on the content word ranged from 18 to 33 % when preceding a noun and from 10 to 23%, excluding determiners, when preceding a verb. Only two determiners preceded verbs in this sample which would skew the results if included. For content words the percentage of dysfluency on the second content word was 21% when it was a noun and 14% when it was a verb.

Table 7. Frequency of different grammatical types of words preceding a noun or verb within a PW and the fluency behaviour of the content word.

	Pronoun		Determiner		Conjunction		Preposition		CW	
	Fl	*Dysfl*	*Fl*	*Dysfl*	*Fl*	*Dysfl*	*Fl*	*Dysfl*	*Fl*	*Dysfl*
Noun	4	2	98	21	18	5	33	11	229	59
Verb	178	19	1	1	34	4	23	7	190	32

CW=content word

A chi-square analysis found no association between the grammatical type of word preceding a content word in a PW and the rate of stuttering.

The relationship between the number of words preceding a content word and the likelihood of that content word being produced fluently is displayed in Figures 14 and 15. Both nouns and verbs are most likely to be preceded by a content word. Single function words occur more frequently in this position than do two, three or four consecutive function words. No obvious relationship is evident between preceding number of words or type of words. When a series of chi-square tests were run, none of them were significant.

28

Nouns

300
250
200
150
100
50
0

1 CW   1 FW   2 FW   3 FW   4 FW
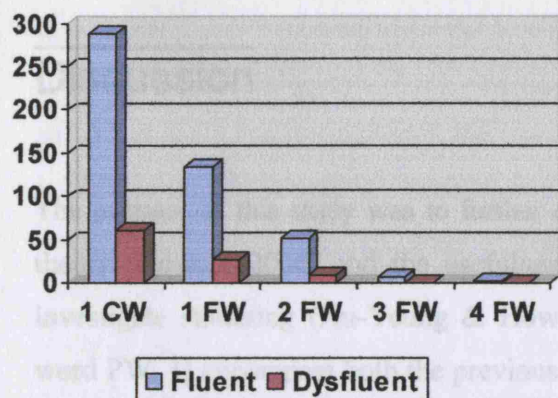
☐ Fluent ☐ Dysfluent

Figure 15.

Number and type of words preceding nouns which are produced fluently or dysfluently.

Verbs

250
200
150
100
50
0

1 CW   1 FW   2 FW   3 FW   4 FW
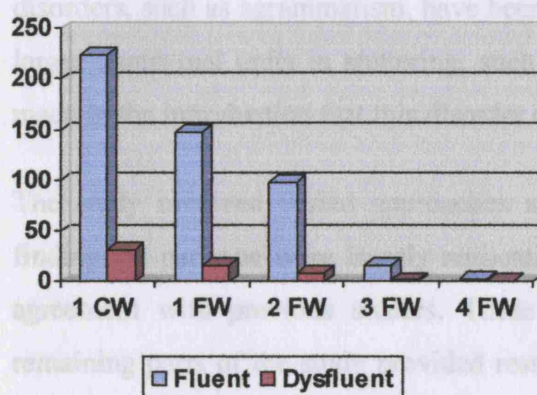
☐ Fluent ☐ Dysfluent

Figure 16.

Number and type of words preceding verbs which are produced fluently or dysfluently.

4.3. Analysis

There does not appear to be a relationship between the type of grammatical word preceding nouns and verbs and dysfluency on these content words This finding supports the PW as a contextual unit for examining stuttering rather than a larger syntactic unit since the function word/content word division appears to be more important than grammatical types of individual words. However, tbe frequency of certain words was limited in the sample and stronger correlations could be drawn from a larger sample. No evidence was found to suggest that the number of function words preceding a content word is related to fluency. However, future research should investigate whether the position of the function word in a sequence of function words preceding a content word in a PW is related to dysfluency. For instance, stalling may only be effective if it occurs on the function word immediately preceding the content word.

Discussion

The purpose of this study was to further examine the claims made by the EXPLAN theory (Howell, 2004) and the usefulness of the PW unit as a contextual unit to investigate stuttering (Au-Yeung & Howell, 1998; Au-Yeung et al., 1998). Multi-word PW, 1) encompass both the previous and current word being produced, 2) allow for different segmentations of verbal output than syntactic units do and 3) suggests a single locus of difficulty – the content word. Findings from other speech and language disorders, such as agrammatism, have been employed to investigate the importance of larger contextual units in stuttering, such as syntactic structures though a case was made in the introduction that this disorder could usefully be examined using PW.

The study involved varied approaches as to what might predict dysfluency. The findings in part one were largely replications of previous work and were mainly in agreement with previous studies. These findings will be summarised next. The remaining parts of the study provided results that require further investigation rather than producing clear-cut conclusions that either supported EXPLAN or did not.

The findings reported in part one are in agreement with previous studies that have examined the relationship between word type and fluency and how it changes with age. Significant support for the notion of stalling and advancing that is central to EXPLAN was found in the present study. The presence of only a few isolated cases of dysfluent function words following content words in PWs indicated that stalling dysfluencies are a way of gaining time to complete the plan for the following content word and therefore the function word can not be positioned after the content word. Complimentarity was also supported with few cases of dysfluent content words following dysfluent function words indicating that stalling dysfluencies produce enough time for the content word to be planned and executed fluently. Hence, stalling prevents advancing dysfluencies.

Overall, for both persistent and recovered groups there was a strong association between word type and dysfluency behaviour, indicating support for the stalling/advancing part of EXPLAN theory. However, the strength of the association

did diminish over age and the recovered 12+ years group showed no significant association between word type and dysfluency behaviour. The persistent group produced more dysfluencies than the recovered group at all test occasions. According to EXPLAN, stuttering on function words, stalling, should decrease for both the persistent and the recovered group at later ages while there should be an increase in content word stuttering for the persistent group as advancing dysfluency replaces stalling. Although evidence was found for this exchange taking place in the persistent group and a decrease in all dysfluency behaviours for the recovered group examination of the separate dysfluency behaviours revealed that it was not a clear-cut trend. For the persistent group advancing behaviours, particularly part word repetitions and within word breaks, increased until age 10-12 years but then decreased at age 12+ years. Furthermore, the use of silent pauses remained high for the persistent group indicating that this type of dysfluency behaviour does not disappear early on by being replaced with advancing dysfluencies. Rather, this group may maintain this behaviour because it is widely accepted in society. While word repetitions and, to a certain extent, filled pauses, are more obvious signs of dysfluency, individuals may adapt to their stutter using these less visible strategies. An alternative explanation would be that something significant occurs at the age between ten and twelve years both for the persistent and the recovered group. The results indicate that not only is there a sudden change in advancing behaviours for the persistent group around 10-12 years, but the reverse pattern is seen in the recovered group creating what approximates a mirror image. The recovered group shows a decrease in advancing behaviours at age 10-12 years, as would be expected, but these behaviours then increase by age 12+ years for part word repetitions in particular but also for prolongations. This is not a strong trend but it may be worth investigating further as it could suggest that dichotomous developments in the individual advancing behaviours around the age of 10-12 years could aid in the prediction of who will persist and who will recover.

It would also be expected that stuttering on content words would increase as advancing dysfluency replaced stalling dysfluency on function words while stuttering on function words decrease and that this effect should be obvious by 10-12 years (Howell et al., 2000). Although dysfluency rates on function words did decrease for the three participants in the current study, dysfluency rate on content words only

increased for one participant. However, three participants are too few to draw conclusions from and participant (2) did show a disproportionately high frequency of stuttering.

For the three types of noun phrases investigated, required, optional and pronoun noun phrases, a significant association between phrase type and fluency was found for the persistent group but not for the recovered group. This result reflected a higher rate of dysfluency on required noun phrases than on pronoun noun phrases hereby supporting the use of PWs as a contextual unit for predicting stuttering. Required noun phrases potentially contain two content words and two function words, i.e. two PWs, while pronoun noun phrases contain one content word and one function word preceding and one following the content word, i.e. one PW. As the two phrases are syntactically similar the cause of the findings may be the differing PW structures. In future studies it will be necessary to be more specific about what noun phrases are included in order to test the predictions of EXPLAN carefully, e.g. only those including a determiner and a noun,

- 'he kicked the boy' [$_{PW}$ [det verb] $_{PW}$ [det noun]]

rather than those containing only a noun,

- 'he kicked Jim' [$_{PW}$ [det verb] $_{PW}$ [noun]]

An interesting finding which should be investigated further is that no dysfluencies occurred on the second determiner 'the' in the second PW. According to the EXPLAN model there should be as much chance of dysfluency appearing on either function words as they are part of separate PWs and could both be used for stalling the content word. Indeed, previous research suggests that dysfluencies are more likely to occur early on in utterances which would implicate a larger syntactic unit than the PW (Bloodstein and Grossman, 1981).

Following from research in the field of aphasia, it was argued that if dysfluencies are affected by syntactic organisation, rather than by PWs, then differences would be expected between those sequences of content words that can occur within the same syntactic constituent (N-V, V-N, N-N) versus those that occur between different syntactic constituents (V-V). Strong support was found for the PW hypothesis in that

the persistent group produced V-V more fluently than the other sequences. Although, V-Vs are more likely to come from separate syntactic constituents, these sequences do not appear to present the persistent stutterers with particular difficulties and their fluency on them improves with age. The recovered group, on the other hand, produced more dysfluency on the V-V sequences than any other sequences. An association was found between word type and dysfluency for the 8-10 years and 12+ years persistent group, but no association for the 10-12 year olds in this group. Again, as was found previously, this age group presents with different results to other ages suggesting a developmental change occurring here.

Upon examination of sequences which occur across boundaries it was found that N-V sequences occurred at a much higher frequency than any other sequence. However, N-V sequences were not stuttered more frequently than any other sequence suggesting that utterance boundaries are not a predictor of stuttering.

Finally, a large amount of research has shown that linguistic factors such as word length, initial sound, content words vs function words, position within sentence, and linguistic stress increase stuttering rates in adults (Bloodstein, 2006). However, only initial position in a sentence has been shown to have an impact on stuttering rates in young children. Clearly more research was needed into the language-based hypothesis about the nature of early stuttering and the final part of the present study investigated the effect of the grammatical type of the function word preceding the content word and the likelihood of that content word being produced dysfluently. Furthermore, the association between the number of function words preceding a content word and dysfluency rates was examined.

Nouns are more likely to be preceded by another content word than a function word, while verbs are more likely to be preceded by function words, particularly pronouns. Nouns preceded by function words had a higher rate of dysfluency than verbs did. Although no significant association was found between grammatical type of function word and dysfluency rate for either nouns or verbs the limited size of the data set suggests that further investigation should be done. Furthermore, there was a general trend for nouns and verbs to mainly be preceded by other content words, then by one function word, then two, then three and very rarely by four. There was no association

between the number of preceding function words and dysfluency rates on the content words which could suggest a number of things. Firstly, this gives us actual information regarding the number of function words which generally occur before a content word in PWs. Secondly, the reason why the number of preceding content words is not important may be because stalling dysfluency must occur at a certain point in the PW which is not related to the number of function words. Hence, in order to provide the speaker with additional time to plan and execute the content word, stallings may have to occur on the function word immediately preceding the content word. Alternatively, depending on how much of the plan for the PW is generated before the first function word is executed, stallings may be produced on the initial function word because this would provide the speaker with additional time before the content word had to be executed. Future research should investigate these hypotheses by examining which function word in a sequence of function words preceding a content word is most likely to produce stalling behaviours.

It is difficult to draw any firm conclusions from null results. Although this analysis did not reveal any significant results, it would be premature to suggest that linguistic factors are not involved in stuttering in children. Further analyses should be done to investigate whether there is a relationship between the grammatical types of both the function word and content words produced dysfluently. Also a reverse analysis should be carried out to investigate whether a function word produced dysfluently has an effect on the following content word. The PW hypothesis suggests that it should not have an effect because of complimentarity but it should be examined whether complimentarity is involved with any type of function word and content word.

A high rate of dysfluencies on specific grammatical types indicates that further research into grammatical types could be potentially productive. An incidental discovery was that numerals were often produced dysfluently in the present data set. Numerals from one to ten are all mono-syllabic, except seven. They are also high frequency words which are acquired early on in language development. Together these factors should be considered both from the position of a PW and a syntactic hypothesis. Other linguistic factors include verbs, regular and irregular, and verb phrases which contain different numbers of complements. Verbs have been found to be particularly difficult to produce by many individuals with aphasia and in order to

investigate the syntactic hypothesis further these should be included in future analyses.

One potential limitation of the present study is that our sample size was relatively small. Therefore, the statistical differences we were able to detect were only those that represented large effect sizes. It is likely that had the sample been larger, between-group differences would have been evident, for instance, for the three types of noun phrases, RNP, ONP and PNP. Future studies into these phrase types may consider more task-driven data collection to ensure that structures investigated, such as the pronoun noun phrases, are produced.

Although spontaneous monologue speech samples provide us with valuable information regarding a child's fluency when actively engaged in language formulation under pressure of speech motor timing constraints, it is not a flawless procedure. As Dworzynski et al. (2003) pointed out the target word is not known by the listener, monologue is an artificial communication situation for a child and , as mentioned previously, structures of specific interest may not be produced in the sample. Furthermore, research has shown that stutterers can predict which words they will stutter on when reading a passage aloud (Guitar, 2006) and might alter their spoken output to avoid such words.

The dysfluencies observed in the clinic may not be representative of all situations and the artificiality of the situation may affect output and therefore analysis. Evidence has been put forward for conditions under which stuttering is reduced or absent (e.g. Bloodstein, 1950). For instance, feeling relaxed and speaking slowly may reduce stuttering while being in an environment with increased communicative pressure, such as a classroom full of other students, may increase stuttering. Hence, a relaxed one-to-one session with a familiar therapist may see the child producing less dysfluencies than they would in many other situations. Furthermore, in this study valuable information regarding production of functions words in PWs was lost because verbal output was produced which resembled lists. One participant produced a large amount of utterances of the type "going out shopping today, spending the money, get some new clothes..." rather than "I am going out shopping today and spending the money. I am going to get some new clothes..." His utterances therefore contained no pronouns,

auxiliaries and conjunctions which may not be representative of the kind of verbal output he would produce outside the clinic.

The combination of data from different researchers is generally an advantage but it may present as a weakness when the tabulated results are examined rather than the complete speech samples. A complete re-examination of Sharif's fiftyfour sound files and additional data sets would have been immensely time consuming, and current time constraints meant that this was not possible. This means that inter-rater reliability, which is a basic requirement for replication of research in science, may have been compromised to a small extent. However, if these factors can be controlled for, large databases of speech samples and analyses are invaluable to stuttering research. Yaruss (in Guitar, 2006), for instance, has called for national databases to be made available with data collected in a consistent fashion. Larger bodies of data will also allow for more powerful statistical analyses. The chi-square test, which was used frequently here, is a test of rather low power especially with small sample sizes.

Research has mainly focused on PWs starting with function words in order to test the advancing/stalling part of EXPLAN theory. However, this has meant that PWs starting with content words have been excluded from further investigation. In the present study, this meant that approximately 50% of the data was not analysed. One area for investigation should include whether a content word is more likely to be produced fluently if there is no function word preceding it as was indicated in the present study. Also, whether there is an effect of types of content words on fluency rates. Informal observations of the present data suggested that certain content words, such as numerals, were particularly vulnerable to dysfluency.

Howell and Au-Yeung's (2002) EXPLAN theory was explicitly developed to account for the increased incidence of dysfluencies on function words in early development. Recently, Howell (in press) proposed a model of serial order of speech which attempts to account for dysfluent speech produced by both fluent, dysfluent and agrammatic speakers. This type of model provides an interesting addition to a field which is sometimes rather rigid and inflexible. Research which embraces different speech and language disorders is more likely to be comprehensive and may find that different theories supplement each other rather than subtract from each other. Language is

undoubtedly involved in stuttering as evident by the fact that young children rarely stutter on one-word utterances and syntactic speech must often by elicited to hear a child stutter (Melnick, Conture & Ohde, 2003).

Locus of dysfluency and interactions of the different factors involved in dysfluency do not appear to be clear cut and no single theory is yet able to account for all the features found in developmental stuttering. Although research into the causes, diagnosis and treatment of stuttering are crucial to the individuals involved, prediction of recovery or persistence, is imperative in particular to 'solve' the speech and language therapist's dilemma regarding when and who to treat.

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```
  (ERM)
  /for
  :MORNING N {within-wd break}
[ (ERM) {revise}
  /I
  :had V
  :cornflakes N
  /for
  :breakfast N
[ /and
  (ERM) {filled pause}
  :went V
  :downstairs V
  /got V
  :dressed V
[ (ERM)
  /I {filled pause}
  :put V
  /these
  :clothes N
  /on
  :yeah N
[ /and
  /then
  /I {silent pause}
  :went V
  (ERM)
  /in {filled pause}
  /a
  :train N
[ {A}
  {O}
  {E}
  /I {within-wd break}
  :was V
  /at
  (ERM)
  :VAUXHALL N {filled pause}
  /I
  :think V
[ :nyeah N
  :Vauxhall N
[ /the
  :second N
  /one
  /I
  :think V
  :yeah N
[ /and
  /I {silent pause}
  :WENT V {rephrase}
  (ERM)
```

[indicates utterance break; capital letters denote dysfluency; V=verbs; N=nouns; / denotes function words; : denotes content words

```
[ /I
  :stopped V
  /at
  :S S STOCKWELL N {part wd rep} {silent pause}
[ /I
  :went V
  /to
  /ANOTHER N {silent pause}
  :train N
  /that
  :took V
  /me
  /to
  :King's N
  :Cross N
[ {A A}
  (ERM)
  /I {within-wd break}
  :stopped V
  :there V
[ :got V
  /some
  :sweets N
[ /and
  /then
  :WENT V {silent pause}
  :here V
[ (ERM)
  :soon V
  /as
  /I
  (ERM)
  :COME V (filled pause}
  /here
  /my
  /MY {silent pause} {word rep}
  :Mum N {rephrase}
  /my
  :Mummy
  :wanted V
  /some
  :COFFEE N {silent pause}
  /so
  /she
  :got V
  /some
[ /and
  /then
  /THEN {silent pause} {word rep}
  /we
  :went V
  :inside V
[ /and
  /we
  {untranscribable sounds like beg of 'just'}
  (ERM)
  :FIRST V {filled pause}
  /we
  (ERM)
  (ERM)
  :PUT V {filled pause}
```

```
/the
:stickers N
/on
/our
:names N
:yeah N
[ :played V
/a
:game N
/WITH {silent pause}
/A
(ERM)
/A {filled pause} {word rep}
:green   N
:BAG N {silent pause}
[ :yeah N
{untranscribable}
[ /what
/I
{untranscribable}
(ERM)
/Y-YOU {within-wd break} {filled pause}
:throw V
/the
:green N
:BAG N {silent pause}
/at
(ERM)
[ /you
:have V
/to
:SAY V {silent pause}
/a
:name N
[ /and
(ERM)
(ERM)
/TO {filled pause}
(ERM)
:yeah N
:SAY V {filled pause}
/a
:name N
[ :yeah N
/and
/WE {silent pause}
:did V
/some
:work N
/after
/that
[ /we
:looked V
/on
/the
:board N
:yeah N
[ :did V
/some
:work N
[ /and
```

```
      /we
      :played V
      :another N
      :game N
      :ladders N
[ /you
  /have V
  /to
  (ERM)
  (ERM)
  :HAVE V {filled pause}
  /a
  :race N
  /I
  :think V
[ /you
  /have V
  /to
  (ERM)
  :JUMP V {filled pause}
  /over
  /their
  :legs N
[ (ERM)
  (ERM)
  :RUN V {filled pause}
  :back V
[ /AN
  {N}
  /AN-ND {part wd rep}
  :jump V
  /over
  /their
  :LEGS N {silent pause}
[ /AND AND {word rep}
  /into
  /your
  :place N
[ :team N
  :B N
  :won V
  (ERM)
  :yeah
[ /AND AND {filled pause} {word rep}
  /I
  :was V
  /in
  (ERM)
  :TEAM N {filled pause}
  :A N
[ /then
  /we
  :have V
  /a (unfinished)
[ /we
  :just V
  /about V
  /to
  :have V
  /some
  :work N
```

```
[ /then
  /she
  :said V
  (ERM)
  :LETS V {filled pause}
  :play V
  /another N
  :game N
[ /so
  (ERM)
  /WE {filled pause}
  :played V
  :AN-ANOTHER N {part wd rep}
  :game N
[ :time N
  :bomb N
  :yeah N
[ /AND AND {word rep}
  /I IF {part wd rep}
  :ANO-E {another within wd break}
  /you
  /are V
  :not V
  :allowed V
  /to
  :throw V
  /the
  (ERM)
  :TIME N {filled pause}
  :bomb N
[ /IF IF {word rep}
  /you
  /IF {silent pause}
  /you
  :do V
  /I
  /do V
  :not V
  :know
  /what
  :happens V
[ :yeah N
  /and
  /Y-YOU {silent pause} {within-wd break}
  :are V
  :just V
  :not V
  :allowed V
  /to
  :do V
  /that
[ /you
  :just V
  /have V
  /to
  (ERM)
  :TAG V {filled pause}
  (ERM)
  /THE {filled pause}
  :time N
  :bomb N
```

```
      /O-ON {part-wd rep}
      /the
      (ERM)
      /THE {word rep} {filled pause}
      (ERM)
    : SHOULDER N {silent pause}
      (ERM)
      /AND {filled pause}
      /THE-THE {word rep}
      :soldier N
      (frustration)
[   :yeah N
      /and
      :yeah N
      /AND AND {filled pause} {word rep >1}
      /THE {silent pause}
      :time N
      :bomb N
      :is V
      /the
      (ERM)
      :GREEN N {filled pause}
      :bag N
[   :yeah N
      (ERM)
[   /and
      {untranscribable}
      /AND {word rep} {silent pause}
      /when
      /the
      (ERM)
      :TIME N {filled pause}
      :is V
      /up
[   /and
      /she
      :said V
      :bang N
[   (ERM)
      /the
      :person N
      /with
      /the
      (ERM)
      :GREEN N {filled pause}
      :bag N
      :is V
      :out V?
[   /and
      /the
      :last N
      /ONE {silent pause}
      /HAS V {silent pause}
      :not V
      /been V
      :blowened V
      /up
      :yet V
      :IS V {silent pause}
      /the
      :winner N
```

```
[ /and
  /that
  :is V
  /all V
  /we
  :did V
[ :pardon N
[ :yeah N
  /it
  :is V
  :nice N
[ :pets N
  :no N
[ :yeah N
  {untranscribable}
[ /and
  /my
  (ERM)
  /MY {filled pause} {word rep}
  :favourite N
  :A{U block}-MAL N {within-wd break}
  :IS IS V {word rep}
  /a
  (ERM)
  :HAMSTER N {filled pause}
  (MM)
[ /we
  :used V
  /to
  :doV
  /in
  (ERM)
  :FORM N {filled pause}
  :two N
[ /but
  (ERM ERM)
  /I{U block} IT {part wd rep} (filled pasue}
  :escaped V
  (ERM)
  /FROM {filled pause}
  {untranscribable}
  :form N
  :sixes N
[ /they
  (ERM)
  /THEY {word rep} {filled pause}
  :put V
  /it
  :open N
  /and
  /it
  :escaped V
[ /and
  /we
  /can V
  :not V
  /we {phrase rep}
  /can V
  :not V
  :find V
  /it
```

```
[ /then
  /we
  :found V
  /it
[ :Frank N
  :put V
  /it
  :back V
[ :escaped V
  :again V
[ /AN AN AND {part wd rep}
  :ever V
  /since
  /we
  /do V
  :not V
  :know V
  /where
  /it
  :is V
  :then V
[ /could V
  /have V
  :been V
  :hurt N
[ :now V
  /can V
  :not V
  :see V
  /it
[ :yeah N
  /AN AND {part wd rep}
  /we
  /might V
  (ERM)
  :HAVE V {filled pause}
  :another N
  /one
  /in
  :form N
  :three N
[ /but
  /it
  :is V
  :just V
  {untranscribable}
  /it {phrase rep}
  :is V
  :just V
  (ERM)
  /A {filled pause}
  :little N
  :cage N
  /at
  /the
  :top N
  /of
  /the
  :C{U block}-CEILING N {part wd rep}
[ :is V
  /a
```

```
    (ERM)
    /A (word rep} {filled pause}
    :spider N
    :plants N
[ /it
  :is V
  :just V
  :one N
[ :is V
  :not V
  /a
  :animal N
  :is V
  :just V
  /a
  :SPI N {within-wd break}
  :plant N
```

```
[ (ERM)
  :talk V
  /about
  :Arsenal N
  :yeah N
[ (ER)
  :second N
  (ER)
  :PREMIER N {filled pause}
  :league N
  :yeah N
[ (ER)
  /IN {filled pause}
  /the
  :quarter N
  :finals N
  /of
  /the
  :FA N
  : Cup N
[ /cause
  /we
  :beat V
  :Chelsea N
[ /IN {silent pause}
  /the
  :sixth N
  :round N
  :THREE {silent pause}
  :one
[ /a
  :quite V
  :good N
  :match N
[ :yeah N
  /cause
  :like V
  /THE {silent pause}
  :goal N
  :was V
  :quite
  :good N
[ :especially V
  {untranscribable}
  :S N {unfinished}
  :scored V
  :again V
  (ERM)
[ :Hasselback's N
  :GOAL N {silent pause}
  :was V
  :quite V
  :good N
  /I-IN {prolongation} {silent pause}
  :top N
  :corner N
[ /then
```

```
  /I
  :think V
  /that
  (ERM)
  :WILTORD N {silent pause}
  :played V
  :good N
[ /he
  :scored V
  :FEW N {silent pause}  goals N
  :yeah N
[ /we
  /are V
  :facing V
  (ER)
  :BOLTON N {silent pause}
  /AND {silent pause
  :Blackburn N
  /IN {silent pause}
  /the
  :FA N
  :Cup N
  :next V
  (MM)
[ /cause
  /I
  /do V
  :not V
  :think V
  /that
  /NO-ONE {silent pause}
  :else V
  /CAN V {silent pause}
  :like V
  :BEAT V {silent pause}
  :Arsenal N
[ /except
  /from
  :KIND-KINDA V {part wd rep}
  :like V
  :LIVERPOOL N {silent pause}
  /and
  /THAT {silent pause}
  :is V
  /it
  :probably V
  :nyeah N
[ :SE-
  /we
  :are V
  :SECOND N {part wd rep}
  /in
  /the
  :premier N
  :league N
  /under
  :Man United
[ /who
  :have V
  :just V
  :WON V {silent pause}
```

```
    /it
    :already V
[  /cause
   /they
   :got V
   :like V
   :C-ERTAIN N {silent pause} {within wd break}
   :amount N
[  :seventythree N
   :points N
   /something
   {untranscribable}
   :not V
   :sixtythree N
   :points N
   /and N
   /we
   /have V
   :got V
   :fifty N
[  /so
   :like V
   /THEY {silent pause}
   /should V
   :actually V
   :win V
   /it
[  /but
   :STILL V {silent pause}
   /I
   :think V
   /WE {silent pause}
   /could V
   :win V
   :CHAMPION'S N {silent pause}
   :League N
   /or
   :FA N
   :Cup N
[  /we
   :are V
   :quite V
   :good N
[  /that
   :is V
   /it
[  /my
   :best N
   :player N
   :is V
   (ER)
   :{untranscribable name} N {silent pause}
   :HARNEREY N {silent pause}
   /or
   :BERGKAMP N {silent pause}
[  /they
   :are V
   :good N
   :players N
[  /cause
   :like V
```

```
  :HARLEY N {silent pause}
  :is V
  :fast V
[ /and
  /he
  :just V
  :come V
  /he
  :SCORED V {prolongation}
  :like V
  /SOMETHING {silent pause}
  :like V
  :SIXTY N {silent pause}
  :goals N
  /SINCE {silent pause}
  /he
  /has V
  :been V
  :there V
[ /and
  :Bergkamp N
  /had V
  :been V
  :there V
  /for
  /a
  :long N
  :time N
[ :about V
  :SIX N {silent pause}
  :SEVEN N {silent pause}
  :seasons N
[ /and
  /he
  :scored V
  :QUITE V {silent pause}
  /a
  /lot
  /of
  :goals N
[ /and
  /he
  :like V {unfinished}
[ /we
  /had V
  :won V
  /the
  :double N
  /in
  :NINTY N {silent pause}
  :EIGHT N {silent pause}
[ /he
  :was V
  {K-} {rephrase}
  /he
  :scored V
  :TWENTY N {silent pause}
  :one N
  :goals N
[ /that
  :kinda V
```

```
:like V
:HELPED V {silent pause}
/us
[ :helped V
:Arsenal N
/to
:win V
:DOUBLE N {silent pause}
{untranscribable}
:quite V
:good N
[ :yeah N
/that
:is V
/it
[ /and
/I
:hate V
(ERM)
:BARBORAYO N {silent pause}
/FROM {silent pause}
:Chelsea
[ /he
:is V
/a
:fauler N
[ /cause
/when
/they
{F} {rephrase}
/when
/they
:played V
:Chelsea N
/in
/the
:SIXTH N {silent pause}
:round N
/of
:FA N {silent pause}
:Cup N
/HE {silent pause}
/was V
:starting V
:DIRTY N {silent pause}
:fauls N
[ :{untranscribable name} N
:LJUNGBERG N {silent pause}
/AN AND {part wd rep}
:Bergkamp N
/for
:sure N
[ :fauler N
```

Appendix 3   Child 2 - age: young

```
[ (ERM)
/I I I {word rep >1}
/have V
:had V
[ (ERM)
```

```
    :TWENTYFOUR N {filled pause} {within wd break}
    :goldfishes N
    /and
    :no {rephrase}
[ /I
    /have V
    :had
    :twelve N
    :THIRTEEN N {prolongation}
    :GOLDFISHES N {within wd break}
[ /and
    :TE {unfinished}
    :E E ELEFEN N {part wd rep}
    :ELEVEN N {word rep}
    /of
    /them
    /have V
    :died V
[ /AN AND {part wd rep}
    /I
    /have V
    :got V
    :TWO N {silent pause}
    :left V
[ /A A AND {part wd rep}
    /I
    /did V
    :have V
    :three N
[ /and
    /I
    :F-WENT V {prolongation}
    /to
    /this
    :CA-ARNIVAL N {silent pause} {part wd rep}
    /WHERE WHERE {wd rep}
    /it
    :is V
    :SE-EVENTY N {part wd rep}
    :P (pence) N
    /a
    :go N
[ /you
    :{unfinished sho probably shot}
    (ERM)
    /you {rephrase}
    (ERM)
    :SHOT V {filled pause}
    :darts N
    /at
    :CARDS N {silent pause}
[ /A AND AND {part wd rep}
    /I
    :won V
    :three N
    :times N
    /on
    /it
[ /and
    /I
    :GOT V {silent pause}
```

```
  :home N
[ /AN
  /AN
  /AND {part wd rep}
  /I
  :SET V {prolongation} {within wd break}
  /my
  :TANK N {within wd break}
  /up
[ {WHA unfinished}
  {untranscribable}
  /I
  /have V
  :had V
  :QUITE V {within wd break}
  /a
  /lot
  :KINDS N {silent pause}
[ /but
  /and {rephrase}
  /it
  :is V
  :NOT V {within wd break}
  :VERY V {within wd break}
  :big N
[ /and
  :guess V
  :RECENTLY  V {within wd break}
  /I
  :got V
  /A {silent pause}
  :proper N
  :TANK N {silent pause}
  :pump N
  :stones N
  (ERM)
  :FILTER N {filled pause}
  :heater N
  /and
  :TRO-OKEL (tropical?) N {within wd break}
  :fish N
[ /and
  /I
  /have V
  :got V
  :FOURTEEN N {silent pause}
  :fish N
[ /I
  /have V
  :got V
  :TWO N {silent pause}
  :goldfish N
  :TWO N {prolongation}
  :LOACH N {filled pause}
  /but
  :ONE N {within wd break}
  :died V
[ (ERM)
  :TWO N {silent pause}
  :HEAD N  {prolongation}
  /and
```

```
      :tails N
[ /and
  (counting under his breath)
  /and
  /I
  /have V
  :GOT V {silent pause}
  :eight N
  :GUPPIES N {silent pause}
[ /and
  /I
  /have V
  :had V
  /MY {silent pause}
  :(ti maybe meaning two) N
  :goldfish N
  /for
  /about V
  :two N
  :years N
  :now V
[ /AND AND {word rep}
  /I
  /AND {rephrase}
  /they
  :were V
  /about V
  :TWO N {silent pause}
  :centimeters N
  /WHEN {within wd break}
  /I
  :got V
  (ER) {rephrase}
  :about V
  :five N
  :centimeters N
  /WHEN {within wd break}
  /WHEN {word rep}
  /I
  :GOT V {within wd break}
  /them
[ /and
  :now V
  :ONE N {within wd break}
  /of
  /them
  :is V
  :about V
  :ten N
  :centimeters N
[ /and
  /it
  /has V (interrupted)
[ :yeah N
  /it
  /has V
  :grown V
[ /AND AND {word rep}
  /and
  :EVERY N {silent pause}
  :time N
```

```
/I
:FEED V {prolongation}
/all N?
/of
/them
/IT IT {word rep}
:AL ALWAYS V {part wd rep}
:eats V
/everything
```

```
[   (ERM)
    /MY {filled pause}
    :name N
    :is V
    /Matthew N
    :{untranscribable name} N
[   :come V
    /from
    :{untranscribable} N
[   (ER)
    /I {filled pause}
    /have V
    :just V
    :turned V
    :eighteen N
[   (ER)
    :TURNED V {filled pause}
    :eighteen N
    :last N
    :weekend N
[   :had
    /a
    :good N
    :party N
[   :good N
    :birthday N
[   :went V
    /out
    :celebrating V
    :all N
    :Friday N
[   :went V
    /out
    :celebrating
    :Saturday N
[   :went V
    /out
    :celebrating V
    :Sunday N
[   (ER)
    /SO {filled pause}
    /I
    /have V
    :just V
    :basically V
    :SOBERED V {silent pause}
    /up
    :today n
[   (ER)
    /I {filled pause}
    /HAVE V {prolongation F}
    :left V
    :COLLEGE N {silent pause}
    :now
[   /I
    :quit V
    :COLLEGE N {silent pause}
```

```
    :early N
[   /I   {prolongation}
    :joined V
    /the
    :Ministry N
    /of
    :Defence N
[   /I
    :am V
    /a
    :technical N
    :apprentice N
    /at
    :RF Henlow N
[   (ER)
    /I {filled pause}
    /have V
    :been V
    /up
    :there V
    /for
    :about V
    :SIX N {silent pause}
    :months N
    :now V
[   :totally V
    :enjoying V
    /it
    :best N
    :thing N
    /I
    /have V
    :ever V
    :done V
[   :earning V
    :loads N
    /of
    :money N
[  (ER)
    :GOING V {filled pause}
    /out
  N :shopping V
   :today
[   :spending V
    /the
    :money N
[   :get V
    /some
    :new N
    :clothes   N
    /and
    /that
[   /so
    /it
    /should  V
    :be V
    :GOOD N {silent pause}
    :day N
[   (ERM)
    :JUST V {filled pause}
    :last N
```

```
    :weekend N
    :bought V
    /myself
    /a
    :budgie N
    /as
    :well V
[   /my
    :family N
    :pet N
[   :Mum
    /and
    :Dad
    /been V
    :WANTING V {silent pause}
    /one
    /for
    :ages N
[   /so
    /I
    :thought V
    :just V
    :go V
    /out
    /and
    :get V
    /one
    (ERM)
[   :last N
    :weekend N
    :ALSO V {silent pause}
    /I
    :went V
    :shopping V
    /to
    :Stevenage N
[   :got V
    /myself
    :NEW N {silent pause}
    :clothes N
    /as
    :well V
[   :new N
    :bag N
[   :new N
    :pens N
    :pencils N
    /for
    :school N
[   :still V
    :doing V
    :college N
    :stuff N
    /as
    :well V
    /as
    /my
    :apprenticeship N
    /so
    :is V
    :not V
```

```
    /that
    :bad N
[   :still V
    :playing V
    :football N
    :SUNDAYS N {silent pause}
    (ER)
    :MORNINGS N {silent pause}
[   :playing V
    :football N
    :Sunday N
    :night N
[   :doing V
    :five N
    :aside V
    :side
    :now V
[   :Thursdays N
    :training V
[   :Fridays N
    :training
[   /so
    /that
    :is V
    /a
    :bit N
    /of
    /a
    :hectic N
    :week N
[   (ER)
    /MY {filled pause}
    :MUM MUM N {word rep)
    :Mum
    /and
    :Dad N
    :are V
    :okay V
    :still
[   (ERM)
    /I {silent pause}
    :bought V
    /myself
    /a
    :car N
[   /I
    /am V
    (ERM)
    :LEARNING V {silent pause}
    /to
    :drive V
    :now V
[   /I
    :failed V
    /my
    :test N
    :F-FOUR N {prolongation}
    :times N
[   /so
    /that
    :is V
```

```
/a
:bit N
/of
/an
:UNDERSTATEMENT N  {silent pause}
```

```
[ /then
  /I (ERM) I {filled pause} {word rep}
  /get V
  :washed V
  /and
  :dressed V
[ /and
  :get V
  /my
  (ERM)
  :BOOKS N {filled pause}
  :ready N
[ /and
  :make V
  :sure N
  /that
  /I
  /have V
 ·:got V
  /my
  :kit N
  /if
  /I
  :need V
  /it
  /for
  :games N
  /or
  :PE N
[ /and
  /then
  /I
  (ERM)
  :LEAVE V {silent pause}
  /the
  :door N
[ /and
  /I
  :go V
  /to
  /the
  (ER)
  :STATION N {filled pause}
  /down
  /the
  :road N
[ /and
  :wait V
  /FO F F F FOR {part wd rep}
  /the
  :train N
[ /and
  /THEN {silent pause}
  /I
  :take V
  /a
  :train N
```

```
(ERM)
/TOWARDS {filled pause}
:ISENTOWN N {silent pause}
[ /where
/I
:get V
/off
/and
:wait V
/for
/a
(ERM)
:DISTRICT N {filled pause}
:line N
:train N
/TO {silent pause}
:westcourt N
:park N
:station N
[ /and
/then
/I
:am V
/at
:school N
(ERM)
[ /MY {filled pause}
:school N
:is V
:Latymer N
[ /it
:is V
/in
:Hammersmith N
[ /it
:is V
/a
:private N
:school N
[ /I
:been V
:there V
/for
:about V
:SIX N {silent pause}
:five N
:years N
[ /and
(ERM)
/I {filled pause}
:am V
:currently V
:doing V
/my
(ERM)
:GCSEs N {filled pause}
[ /which
/I
/am V
:taking V
/in
```

```
    :MAY N {silent pause}
    /until
    :June N
[  (ERM)
    /I {filled pause}
    /am V
    :doing V
    (ERM)
    :HISTORY N {filled pause}
    :RS N {silent pause}
    /and
    :art N
[  /and
    /the
    :usual N
    :subsets N
[  /my
    :choice N
    /for
    :games N
    :is V
    :football N
    /and
    :table tennis N
    /for
    /the
    :rest N
    /the
    :summer N
[  /and
    /I {silent pause}
    :recently V
    :did V
    /my
    :mock N
    :examinations N
[  /where
    /I
    :got V
    :mostly V
    :Bs N
    /and
    :Cs N
[  /I
    /am V
    :H HOPING V {part wd rep}
    :HOPING V {word rep}
    /to
    :improve V
    /FOR {silent pause}
    /my
    :real N
    :exams N
[  (ERM)
    /I (ERM) I {filled pause} {word rep}
    :currently V
    :own V
    /a
    :hamster N
    :CALLED V {silent pause}
    :Barney N
```

```
[ /who
  /I
  /have V
  :had V
  /for
  :about V
  :TWO N {silent pause}
  /and
  /a
  :half N
  :years N
[ (ERM)
  /HE {filled pause}
  :is V
  /a
  :Russian
  :dwarf N
  :hamster N
[ /which
  :makes V
  /which [rephrase}
  :means V
  /that
  /he
  :is V
  :SMALLER N {silent pause}
  /than
  (ERM)
  :USUALLY V {filled pause}
  :hamsters N
[ /and
  /he
  :was V
  /a
  :baby N
  /from
  :two N
  :previous N
  :hamsters N
  /who
  /I
  :thought V
  :were
  :both N
  :male N
  /but
  /they
  :were V
  :not V
[ /and
  /then
  /THE THE {word rep}
  :female N
  :had V
  :babies N
[ /she
  :had V
  :about V
  :five N
  /I IN N IN {part wd rep}
  :total N
```

```
[ /I
  :kept V
  :three N
  /of
  :two N {rephrase}
  /of
  /them
[ /and
  :one N
  /of
  /them
  :died V
  :about V
  :half N
  /a
  :year N
  :ago V
[ :AN ANO NTHER N {part wd rep}
  /AN ANOTHER
  /one
  :IS IS V {word rep}
  :still V
  :alive N
[ (ERM)
  /he
  :RECENTLY V {silent pause} {rephrase}
  /he
  /has V
  /been V
  :sleeping V
  /a
  /lot
  :more N
  /than
  :usual N
[ /cause
  /he
  /is V
  :starting V
  /to
  :get V
  :old N
  :now V
[ /and
  /he
  :is V
  :older N
  /than
  :usual N
  /because
  /they
  :live V
  /for
  :about
  :two N
  :years N
  /and
  /he
  /has V
  :been V
  :alive N
```

```
    /for
    :about V
    :two N
    /and
    /a
    :half N
    :now V
[   /so
    /he
    /is V
    :getting V
    /a
    :bit N
    (ERM)
    :GRUMPY N {filled pause}
    /in
    /his
    :old N
    :age N
[   /and
    /he
    :used V
    /to
    :play V
    /on
    /his
    :wheel N
    :quite V
    /a
    /lot
[   /but
    :recently V
    /he
    /has
    :not V
    :been V
    /AT AT {word rep}
    :all V
    /because
    /he
    /has V
    :been V
    :too V
    :tired N
[   /cause
    /he
    /O O OF {part wd rep} {rephrase}
    /his
    :age N
```

```
[ /then
  /I (ERM) I {filled pause} {word rep}
  /get V
  :washed V
  /and
  :dressed V
[ /and
  :get V
  /my
  (ERM)
  :BOOKS N {filled pause}
  :ready N
[ /and
  :make V
  :sure N
  /that
  /I
  /have V
  :got V
  /my
  :kit N
  /if
  /I
  :need V
  /it
  /for
  :games N
  /or
  :PE N
[ /and
  /then
  /I
  (ERM)
  :LEAVE V {silent pause}
  /the
  :door N
[ /and
  /I
  :go V
  /to
  /the
  (ER)
  :STATION N {filled pause}
  /down
  /the
  :road N
[ /and
  :wait V
  /FO F F F FOR {part wd rep}
  /the
  :train N
[ /and
  /THEN {silent pause}
  /I
  :take V
  /a
  :train N
```

```
      (ERM)
      /TOWARDS {filled pause}
      :ISENTOWN N {silent pause}
[ /where
      /I
      :get V
      /off
      /and
      :wait V
      /for
      /a
      (ERM)
      :DISTRICT N {filled pause}
      :line N
      :train N
      /TO {silent pause}
      :westcourt N
      :park N
      :station N
[ /and
      /then
      /I
      :am V
      /at
      :school N
      (ERM)
[ /MY {filled pause}
      :school N
      :is V
      :Latymer N
[ /it
      :is V
      /in
      :Hammersmith N
[ /it
      :is V
      /a
      :private N
      :school N
[ /I
      :been V
      :there V
      /for
      :about V
      :SIX N {silent pause}
      :five N
      :years N
[ /and
      (ERM)
      /I {filled pause}
      :am V
      :currently V
      :doing V
      /my
      (ERM)
      :GCSEs N {filled pause}
[ /which
      /I
      /am V
      :taking V
      /in
```

```
     :MAY N {silent pause}
     /until
     :June N
[  (ERM)
     /I {filled pause}
     /am V
     :doing V
     (ERM)
     :HISTORY N {filled pause}
     :RS N {silent pause}
     /and
     :art N
[  /and
     /the
     :usual N
     :subsets N
[  /my
     :choice N
     /for
     :games N
     :is V
     :football N
     /and
     :table tennis N
     /for
     /the
     :rest N
     /the
     :summer N
[  /and
     /I {silent pause}
     :recently V
     :did V
     /my
     :mock N
     :examinations N
[  /where
     /I
     :got V
     :mostly V
     :Bs N
     /and
     :Cs N
[  /I
     /am V
     :H HOPING V {part wd rep}
     :HOPING V {word rep}
     /to
     :improve V
     /FOR {silent pause}
     /my
     :real N
     :exams N
[  (ERM)
     /I (ERM) I {filled pause} {word rep}
     :currently V
     :own V
     /a
     :hamster N
     :CALLED V {silent pause}
     :Barney N
```

```
[ /who
  /I
  /have V
  :had V
  /for
  :about V
  :TWO N {silent pause}
  /and
  /a
  :half N
  :years N
[ (ERM)
  /HE {filled pause}
  :is V
  /a
  :Russian
  :dwarf N
  :hamster N
[ /which
  :makes V
  /which [rephrase}
  :means V
  /that
  /he
  :is V
  :SMALLER N {silent pause}
  /than
  (ERM)
  :USUALLY V {filled pause}
  :hamsters N
[ /and
  /he
  :was V
  /a
  :baby N
  /from
  :two N
  :previous N
  :hamsters N
  /who
  /I
  :thought V
  :were
  :both N
  :male N
  /but
  /they
  :were V
  :not V
[ /and
  /then
  /THE THE {word rep}
  :female N
  :had V
  :babies N
[ /she
  :had V
  :about V
  :five N
  /I IN N IN {part wd rep}
  :total N
```

```
[ /I
  :kept V
  :three N
  /of
  :two N {rephrase}
  /of
  /them
[ /and
  :one N
  /of
  /them
  :died V
  :about V
  :half N
  /a
  :year N
  :ago V
[ :AN ANO NTHER N {part wd rep}
  /AN ANOTHER
  /one
  :IS IS V {word rep}
  :still V
  :alive N
[ (ERM)
  /he
  :RECENTLY V {silent pause} {rephrase}
  /he
  /has V
  /been V
  :sleeping V
  /a
  /lot
  :more N
  /than
  :usual N
[ /cause
  /he
  /is V
  :starting V
  /to
  :get V
  :old N
  :now V
[ /and
  /he
  :is V
  :older N
  /than
  :usual N
  /because
  /they
  :live V
  /for
  :about
  :two N
  :years N
  /and
  /he
  /has V
  :been V
  :alive N
```

```
  /for
  :about V
  :two N
  /and
  /a
  :half N
  :now V
[ /so
  /he
  /is V
  :getting V
  /a
  :bit N
  (ERM)
  :GRUMPY N {filled pause}
  /in
  /his
  :old N
  :age N
[ /and
  /he
  :used V
  /to
  :play V
  /on
  /his
  :wheel N
  :quite V
  /a
  /lot
[ /but
  :recently V
  /he
  /has
  :not V
  :been V
  /AT AT {word rep}
  :all V
  /because
  /he
  /has V
  :been V
  :too V
  :tired N
[ /cause
  /he
  /O O OF {part wd rep} {rephrase}
  /his
  :age N
```