ROBERTSON

FACTORS INFLUENCING PERSISTENCE AND RECOVERY IN STUTTERING: THE ROLE OF INTELLIGENCE, SELF-ESTEEM AND BULLYING.

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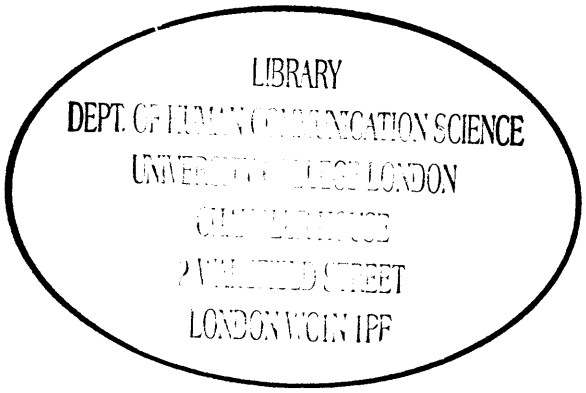

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II. ACKNOWLEDGEMENTS

I would like to thank my supervisor Steve Davis for all his invaluable help and advice during the undertaking of this project. I also wish to thank Peter Howell and Dino Petrides for their additional support. Many thanks go to the young people who participated in this study, for their time and support of the research at UCL into the disorder of stuttering.

III. ABSTRACT

Early research has shown that people who stutter tend to be of lower than average intelligence and are more likely to be bullied than their peers who do not stutter. Their self-esteem, however, is close to average. Studies have not looked at all of these factors in the same group of individuals. Consequently, this study investigated intelligence, self-esteem and experiences of being bullied in a sample of 29 young people who stutter. Participants were divided into a persistent and a recovered group as it was hypothesised that earlier findings might be more apparent with speakers who persist with their stutter. The Raven's Standard Progressive Matrices (Raven, Raven & Court, 2004), Harter's (1985, 1988) self-perception profiles and a newly-designed bullying questionnaire were used to assess intelligence, self-esteem and experiences of being bullied, respectively. It was found that the intelligence and self-esteem (when measured by competency alone in particular skill domains) for both groups were not significantly below the average for fluent people. However, it was found that the incidence of bullying reported to be experienced by both groups was much higher than estimates for bullying in school children in general (not necessarily with fluency problems). No difference was found in intelligence or experiences of being bullied between the persistent and recovered groups. However, the self-esteem of the recovered group was significantly lower than that of the persistent group, when measured by the mean discrepancy between competence and importance scores in particular skill domains. These findings are discussed for their significance in relation to the treatment and support provided for young people who stutter.

WORD COUNT: 10,167.

IV. INTRODUCTION

(i) Stuttering

Stuttering (also termed stammering or dysfluency) is a disturbance in the normal fluency and time patterning of speech that is inappropriate for the individual's age (American Psychiatric Association, 2000). Onset may occur at any time during childhood, between the beginning of multi-word appearances (around 18 months) and puberty (11 or 12 years), however it is most likely to occur between the ages of two and five years (Andrews, Craig, Feyer, Hoddinott, Howie & Neilson, 1983). Stuttering appears to develop without any obvious cause. Andrews et al. (1983) termed the developmental form 'idiopathic' stuttering and contrasted it with acquired stuttering, which can begin in a fluent speaker after an obvious cause such as brain damage.

The diagnostic features of stuttering, as set out in the DSM-IV-TR (American Psychiatric Association, 2000), include frequent repetitions or prolongations of sounds or syllables, interjections, broken words (e.g. pauses within words), audible or silent blocking (filled or unfilled pauses in speech), circumlocutions (word substitutions to avoid problematic words), words produced with an excess of physical tension and monosyllabic whole-word repetitions (all under Criterion A). Stuttering is also diagnosed if the disturbance of fluency interferes with academic or occupational achievement or with social communication (Criterion B), or if a speech-motor or sensory deficit is present, the speech difficulties are in excess of those usually associated with these problems (Criterion C). Stuttering is therefore more than just a speech disorder, and can influence affective behaviours too.

Studies on school children in the United States, Europe, Africa, Australia and the West Indies have shown that the prevalence of stuttering throughout the school years is about 1% (Bloodstein, 1995). When cases of stuttering lasting longer than six months are examined, the percentage of people who have stuttered at some time in their lives is estimated at around 5% (Andrews et al., 1983).

(ii) Recovery

Longitudinal studies of early childhood stuttering have shown that recovery rates, without professional treatment, can range from 36% (Cooper, 1972) to around

89% (Yairi & Ambrose, 1992a). Some of this variability may be due to the fact that the studies reported were based on different age groups (Bloodstein, 1995).

Recovery rates following treatment are also relatively high; for example, Onslow, Andrews and Lincoln (1994) investigated how a group of children aged below five years of age showed an improvement in their fluency following a parent-conducted programme of verbal response-contingent stimulation. The authors found that all of the children achieved median percentage syllables stuttered scores below 1.0 for a 12-month post-treatment period. Lincoln and Onslow (1997) further reported that these children continued to present near-zero levels of stuttering at seven years post-treatment.

Craig, Hancock, Chang, McCready, Sheppley, McCaul, Costello, Harding, Kehren, Masel and Reilly (1996) investigated the effectiveness of three treatments (intensive smooth speech, intensive electromyography and home-based smooth speech) on children and adolescents (aged 9-14 years) who stuttered. The authors found that the treatment group's stuttering was decreased to an average of less than one percent syllables stuttered post-treatment, with a mean improvement in stuttering frequency of at least 85%. There was no significant difference between the effectiveness of the three treatments.

Against this background of reports of successful treatment, however, Kalinowski, Saltuklaroglu, Dayalu and Guntupalli (2005) conducted a survey of 101 speech and language therapists practicing in the North Carolina (USA) public school system, which assessed therapeutic efficacy in the management of stuttering. The therapists reported using a wide array of techniques known to reduce stuttering, treating a total of 2,036 children, yet the median reported recovery rate was only 13.9%. The authors therefore concluded that existing claims of therapeutic success may best be attributed to natural spontaneous recovery. However, it should be noted that 'recovery' in this study was defined as the complete removal of all overt and covert stuttering events, whereas the studies of Onslow et al. (1994), Lincoln and Onslow (1997) and Craig et al. (1996) maintained that a criterion of less than two percent syllables stuttered indicated that treatment was successful.

(iii) Persistence

Regardless of whether a person who stutters is treated or not, it is believed that around 1% of adults persist in their stuttering (Andrews & Harris, 1964). Factors that may influence persistence in stuttering include:

Gender: There is a substantial increase in the male-to-female ratio from around 2:1 at onset (Yairi & Ambrose, 1992b) to 5.5:1 in older children (Bloodstein, 1995). Therefore there appears to be higher persistence rates among boys than girls (Yairi & Ambrose, 1992a).

Age: The older the child, the less likely it appears to be that stuttering will develop (Bloodstein, 1995). However, a later age of onset appears to be indicative that the disorder will persist (Yairi, Ambrose, Paden & Throneburg, 1996). It should be noted that in the latter study, the majority of the persistent stuttering group were boys and it has been shown that boys begin stuttering an average of 5 months later than do girls (Yairi & Ambrose, 1992b). Thus age at onset and gender may interact as predictive factors for persistence in stuttering.

Heredity: Andrews et al. (1983) estimated that the incidence of stuttering among first-degree relatives of stutterers was more than three times that in the general population. There also appears to be a high degree of concordance of stuttering in identical twins (Bloodstein, 1995). Moreover, Yairi et al. (1996) found that persistence and recovery in stuttering tends to run in families; the children in the study who had persistent stuttering had significantly more stuttering relatives who were persistent than who had recovered, and the children who had recovered from stuttering had significantly more stuttering relatives who had recovered from stuttering than became persistent.

Overt speech characteristics: Recovery is more likely if simple and regular repetitions of syllables (if few in number) predominate than if speech is dominated by blocks (momentary occlusions of the airway) and prolongations (Van Riper, 1973). Indeed, if the child's speech contains a substantial proportion of sound prolongations, this can signify a high risk of developing a chronic disorder (Conture, 1982).

In support of the findings of Van Riper (1973), Yairi et al. (1996) found that initial levels of part-word and monosyllabic word repetitions in dysfluent speech were higher in a recovered group than in a persistent group observed.

(iv) Psychosocial Factors

The above review examined the speech and biological characteristics that might separate persistent and recovered speakers, which have been dominant themes in stuttering research. Less work has been done on whether psychosocial factors are inherent to speakers who stutter (whether they recover or not) or whether they are specifically associated with persistent speakers, and are not in evidence after recovery. Past research suggests relevant factors that ought to be investigated are the intelligence of the person, their self-esteem and their experience of being bullied.

Intelligence

Intelligence as a concept is very difficult to define, and as such, no single definition has been accepted by all. There is also a great debate in intelligence theory as to whether intelligence is one unitary ability or if different types and qualities of intelligence exist. Spearman (1904, cited by Brody, 1992) originally proposed that all conceivable measures of intelligence were related to a common general intellectual function. However, Thurstone (1938, cited by Brody, 1992) argued the case for separate, unrelated, 'primary mental abilities', which included spatial, numerical and verbal reasoning. Thurstone believed that evaluating these separate abilities would lead to a much more accurate assessment of the strengths and weaknesses of individual people than would an evaluation that was based on a single score. Cattell (1987, cited by Brody, 1992) added to the debate by proposing that Spearman's 'common general intelligence' could be further divided into two separate factors called *fluid* and *crystallized* ability. The former refers to the ability to deal with new and unusual problems, requiring speed and flexibility, whilst the latter refers to the individual's store of previously acquired skills and information that may be used to deal with familiar problems or similar issues.

Intelligence Testing

Recent work has indicated that intelligence may best be considered as an array of abilities and is therefore best evaluated with multifaceted instruments. Generally, intelligence scores are converted to a scale in which the mean is 100 and the standard deviation (the variability of the distribution of scores) is 15. About 95% of the population has scores within 2 standard deviations of the mean (i.e. between 70 and 130). For historical reasons, the term "IQ" is often used to describe scores on tests of

intelligence, and refers to "Intelligence Quotient," which was originally formed by dividing a so-called mental age by a chronological age, although this procedure is no longer used (Neisser, Boodoo, Bouchard, Boykin, Brody, Ceci, Halpern, Loehlin, Perloff, Sternberg & Urbina, 1996).

In the majority of commonly-used intellectual assessments, significant emphasis is placed on verbal components. Thus when assessing the cognitive abilities of people with language impairments or dysfluency it is important to use non-verbal, performance-based tests, in order that discriminations are not made on the basis of language ability. According to McCallum (2003), nonverbal assessment may be used to describe: "a test administration process in which no receptive or expressive language demands are placed on either the examinee or the examiner" (p3). Such tests assess general intelligence, not merely nonverbal intelligence.

Stuttering and Intelligence

Andrews and Harris (1964) carried out an in-depth investigation into the cognitive abilities of a sample of a number of schoolchildren, aged between 9 and 11 years, from Newcastle Upon Tyne. They found that the stuttering group had a mean IQ of 94.7 compared with a mean IQ of 101.8 for the non-stuttering group (a significant difference of half a standard deviation relative to norms), using the Wechsler Intelligence Scales for Children (WISC; Wechsler, 1949). There was also a significantly greater number of stuttering than non-stuttering children who scored below 90.

Schindler (1955) analysed data collected from more than 20,000 Iowa schoolchildren and found that the mean IQ of the stuttering group was 94.9 compared with an IQ of 99.5 for the non-stuttering group, using the Otis Test of Mental Ability (Otis, 1928). This difference was significant at the 1% level.

In their study into the onset and development of stuttering in young children, Wendell Johnson et al. (1942) reported a range of IQ from 80 to 159 for the stuttering group, with a median IQ of 114. IQ in the non-stuttering group ranged from 95 to 158, with a median of 116. The authors did not report the methods used for scoring IQ.

Okasha, Bishry, Kamel and Hassan (1974) assessed a group of Egyptian schoolchildren and found that the mean IQ of children who stuttered was significantly lower than that of the control group (IQ scores of 94 and 101 respectively), using the Goodenough-Harris Drawing Test (Harris, 1963).

Although the average difference of several IQ points may not appear important in practice, the difference found in the above studies needs to be explained. Andrews and Harris (1964) suggested that a lower IQ might be indicative of brain damage. Though the authors do not comment, an organic aetiology of stuttering might be more likely to be associated with persistent forms. Thus if Andrews and Harris's suggestion is correct, lower IQs might be expected in persistent stutterers, but not in recovered ones.

Another explanation is that the difference may be based in the methodology used. In Andrews and Harris's (1964) study, the WISC was used to assess intelligence, which may have resulted in a disadvantage for the stuttering group as it includes language ability measures. It is also not certain whether Schindler (1955), Johnson et al. (1942) and Okasha et al. (1974) ensured that their assessments were entirely non-verbal and their measures may have included some verbal aspects, such as experimenter instructions. Thus the differences in IQ previously observed may merely reflect anomalies in the assessment procedures employed.

Alternatively, it may be that as the most recent study was carried out by Okasha et al. in 1974, the difference in IQ scores is no longer apparent today, due to increases in general intelligence as a result of improvements in areas such as nutrition (Martorell, 1998) and education (Husén & Tuijnman, 1991).

Interestingly, Cox (1982) and Andrews and Harris (1964) found that people who stutter attending treatment clinics appeared to be of *above* average intelligence and of a higher social class. One explanation for these findings may be the influence of intelligence and social class on access to health care (Furnham & Davis, 2004).

Self-Esteem

There are numerous accounts of the origin and function of self-esteem in humans. Together with the notion of self-concept, self-esteem forms an important part of how people, including individuals who stutter, perceive themselves. Self-concept refers to the self-description of the many characteristics of, and roles carried out by, an individual. Self-esteem is the evaluative assessment of these descriptions and refers to feelings of self-worth (Yovetich, Leschied & Flicht, 2000). Leary (1999) observed that self-esteem may be further sub-divided into *state* self-esteem, reflecting momentary fluctuations in a person's feelings about themselves, and *trait* self-esteem, reflecting the person's general appraisal of his or her value.

In a recent review of the origins of self-esteem, Leary (1999) suggested that self-esteem is a psychological mechanism that monitors the quality of people's relationships with each other, and the degree to which the individual is being accepted by others. This 'sociometer' is thought to have evolved because early human beings who belonged to social groups were more likely to survive and reproduce than those who did not.

Stuttering and Self-Esteem:

People who stutter may develop certain covert behaviours as a result of their speech impediment, depending on their personality and coping strategies for life stresses and events in general (Bajina, 1995). Such behaviours may include developing a negative self-image, possibly as a result of others' perceptions of them. For example, it has been shown that school-age children have a more negative perception of people who stutter than people who do not, rating the former as being less intelligent and having more negative personality traits. These were identified using a semantic differential scale of bi-polar adjective pairs to rate the speaker on intelligence and personality traits (Franck, Jackson, Pimentel & Greenwood, 2003).

This negative opinion of personality traits in people who stutter continues into adulthood; Dorsey and Guenther (2000) asked American college professors to complete a questionnaire containing 20 personality items, and to judge, on a scale of 1-7, the degree to which a hypothetical college student who stutters or a hypothetical non-stuttering student possessed the trait in question. They found that the professors perceived the stuttering student as being more negative on most personality traits in comparison with the non-stuttering student.

However, these negative perceptions do not appear to significantly affect the self-esteem of people who stutter. For example, Yovetich et al. (2000) rated various forms of self-esteem in a sample of elementary school children who stuttered, ranging in age from 7.1 to 11.9 years. Scores were extracted using the Culture Free Self-Esteem Inventory, 2nd Edition (Battle, 1992), which measures *General, Social, Academic and Parent-Related* self-esteem, and *Total* self-esteem, a tally of the other four components. The *General* subscale would appear to reflect 'trait' self-esteem in Leary's (1999) categories and the *Social*, *Academic* and *Parent-Related* subscales would appear to reflect 'state' self-esteem. The authors found that the children who stuttered produced scores on all five sub-scales that were similar to those of the

overall population of elementary school children. Thus both 'trait' and 'state' self-esteem appear to be average for people who stutter, indicating that their dysfluency does not negatively affect either their general or fluctuating feelings of self-worth.

The Yovetich et al. findings were supported by Blood, Blood, Tellis and Gabel (2003), who investigated the self-esteem of older children who stutter (ranging from 13.6 to 18.4 years). The authors found that 85% of the participants scored within one standard deviation of the mean on the Rosenberg Self-Esteem Scale (Rosenberg, 1965), indicating positive self-esteem.

However, Bajina (1995) investigated a group of 28 persistent adult stutterers and found that they produced significantly lower self-esteem scores than the non-stuttering control group. The author also stated that there is much anecdotal clinical evidence as to the comments made by people who persist with their stutter regarding their feelings of low self-worth and low confidence.

Bullying

Bullying is usually defined as a negative intentional action aimed at causing either physical or psychological harm to an individual who is not in a position to defend herself or himself (Rigby, 1996). It appears to be a common problem in mainstream schools (Smith & Brain, 2000), and research has shown that the problem of bullying may be even more prevalent among children with special educational needs (Whitney, Nabuzoka & Smith, 1992), which includes children who stutter (Mooney & Smith, 1995). Whitney et al. (1992) identified three factors that may increase the likelihood of children with special needs being bullied; they may have characteristics which could be viewed as a pretext for bullying, they may have fewer friends than mainstream children and therefore lack the beneficial effect which a group often provides, and they may be seen as pro-active victims and less socially competent in ways that make them more likely to be bullied.

Bullying and Stuttering

Mooney and Smith (1995) investigated the retrospective accounts of 324 adults who were persistent stutterers and found that 82% of respondents were bullied at some point in their school lives, with 93% of these reporting that the bullying was often related to the stammer and 84% reporting difficulties making friends.

In support of these findings, Hugh-Jones and Smith (1999) found that 83% of the 276 persistent adult stutterers who participated in their survey reported that they had been bullied at some period during their time at school. 53% of respondents stated that the bullying was 'always' or 'very often' related to their stutter and 25% stated that this was 'sometimes' the case. However, severity of stutter was not found to be a direct predictor of being bullied in the logistic regression analysis used. Rather, in support of the findings of Whitney et al. (1992), the significant variable in predicting bullying was difficulty in making friends; 31% of respondents found that it was 'always' or 'very often' hard to make friends and 32% reported that this was 'sometimes' hard. 51% of respondents indicated that their difficulty in making friends was a direct result of their stutter.

Davis, Howell and Cook (2002) used a forced-choice sociometric procedure to assess the relationships between 16 dysfluent children and their classmates, aged between 8 and 14 years. The authors found that in comparison with their fluent peers, the children who stuttered were three times more likely to be identified as victims of bullying, were socially rejected significantly more often and were viewed as less popular.

Thus stuttering behaviour may influence whether or not a child is bullied at school. However, the bullying itself may have a negative impact on stuttering; in Mooney and Smith's (1995) study, 11% of respondents reported increased speech difficulties as a result of bullying behaviour, and 6% of respondents in Hugh-Jones and Smith's (1999) study reported that the bullying had a long-term effect on their speech difficulties.

Bullying and Self-Esteem

From previous research, it is apparent that low self-esteem is associated with being the victim of bullying. For example, Slee and Rigby (1993) examined the relevance of selected personality variables and self-esteem to the tendency to be bullied in Australian male primary school children. The authors found that the tendency to be victimised was significantly associated with introversion and low self-esteem.

These findings were supported by Mynard, Joseph and Alexander (2000), who found that peer victimisation was associated with lower self-esteem and higher posttraumatic stress in adolescents attending English Secondary schools.

In the retrospective accounts of the 324 adults who stutter in the study by Mooney and Smith (1995), 65% of respondents reported some form of personal effect, such as loss of self-esteem, as a result of the bullying they experienced at school. In addition, 63% of respondents who stutter in the Hugh-Jones and Smith (1999) study reported short term personal effects as a result of the bullying experienced at school, including loss of self-confidence and self-esteem. 32% of respondents further reported that they experienced these effects in the long-term.

(v) Objectives

First, selected points from the above review are summarised. There has been speculation that IQ problems in children who stutter are associated with brain damage (Andrews & Harris, 1964), and here it has been argued that if this is so, lower IQs might specifically be associated with persistent forms of stuttering. Bajina's (1995) study on self-esteem explicitly used persistent developmental stutterers, and the large scale surveys of Mooney and Smith (1995) and Hugh-Jones and Smith (1999) were also conducted on persistent adults who stutter, therefore it is surmised that their findings are specific to persistent stutterers. Surprisingly, there is no large-scale study of bullying in *children* who stutter (which would include those who will recover as well as those who will persist). Only two studies have been reported (Slee & Rigby, 1993; Mynard et al., 2000) which looked at how the psychosocial factors interacted with each other, although neither was conducted on stuttering populations.

Thus previous studies have not been directed in a systematic way at examining the influences of these three psychosocial factors on stuttering outcome, i.e. whether a person will persist with or recover from their stutter. Furthermore, possible interactions of these factors have not been investigated, in order to discover any combined effect on persistence or recovery that may exist. Therefore the objectives of the present study are as follows:

1. To determine if there are differences on scores of non-verbal intelligence and self-esteem between:
    (i) People who stutter and normative data for the United Kingdom (non-stuttering) population.
    (ii) Persistent and recovered people who stutter.

2. To determine the nature and incidence of school bullying experiences of people who stutter and to determine if these experiences differ between recovered and persistent people who stutter.
3. To determine if a combination of intelligence, self-esteem and experiences of being bullied is able to predict whether or not a person will recover from stuttering.

(vi) Hypotheses

Specific hypotheses for each factor were as follows:

Intelligence:

Hypothesis 1: The educational system has been improved so that it reaches children with all forms of disadvantage, including stuttering. These policies would be expected to have an impact on IQ. Therefore children who stutter would specifically be expected to benefit from these policies relative to their fluent peers. Thus, contrary to previous findings, it is predicted that the intelligence scores for the stuttering participants will not be significantly different from normed averages for the UK's non-stuttering population.

Hypothesis 2: In line with the suggestion by Andrews & Harris (1964) that IQ problems in children who stutter might be associated with brain damage (which is more likely to be associated with persistent forms of stuttering), it is predicted that intelligence scores for persistent participants who stutter will be lower than those for recovered stutterers.

Self-Esteem:

Hypothesis 3: In line with the work of Bajina (1995) and anecdotal evidence from clinicians suggesting that self-esteem is negatively affected by a fluency disorder, it is predicted that people who stutter will have lower than average self-esteem scores when compared to the general population.

Hypothesis 4: As the study of Bajina (1995) was conducted on persistent stutterers, people who have recovered from stuttering may have higher self-esteem ratings than persistent people who stutter.

Bullying:

Hypothesis 5: It is predicted that there will be a high incidence of bullying amongst the people who stutter, in line with the findings of Davis et al. (2002), Mooney and Smith (1995) and Hugh-Jones and Smith (1999).

Hypothesis 6: It is predicted that people who have recovered from their stutter will have experienced less bullying whilst at school than those who have persisted with their stutter. This hypothesis is based on the findings of Mooney and Smith (1995) and Hugh-Jones and Smith (1999), which indicated that bullying had a negative impact on the speech difficulties of persistent people who stutter.

Interactions:

Hypothesis 7: It is predicted, based on the findings of Slee and Rigby (1993) and Mynard et al. (2000) that self-esteem and bullying might interact to predict persistence or recovery in people who stutter, when intelligence is controlled for. Thus, taking the findings of Bajina (1995), Mooney and Smith (1995) and Hugh-Jones and Smith (1999) into account, it is hypothesized that low self-esteem and extensive experiences of being bullied may predict persistence in stuttering.

V. METHOD

(i) Participants

Twenty nine participants took part in this study, and they ranged in age from 10 years, 6 months to 20 years, 8 months. The mean age for the group was 15.92 years. There were 9 females (31%) in the group, and 20 males (69%). All participants lived in the UK (28 in England, 1 in Scotland) and all of them spoke English as their first language.

Ten participants (34%) were considered to have recovered from their stutter, with 19 participants (66%) identified as persistent people who stutter. The criteria for the persistent participants were that a) they were originally diagnosed as stuttering at age eight by a trained pathologist and assessed with the stuttering severity instrument, SSI-3 (Riley, 1994), b) at the time of the tests they were designated as still stuttering by themselves, their parents and by a member of the University College London (UCL) Speech Research Team and c) they scored 24 or above on the SSI-3 at the time of testing.

The criteria for the recovered participants were that a) there was the same original diagnosis as with the persistent speakers at outset, b) at the time of the tests, they were considered by themselves, their parents and a member of the UCL Speech Research Team as not stuttering and c) they scored below 24 on the SSI-3 at the time of testing and their SSI-3 score had decreased by at least 2 points between the initial and the subsequent SSI-3 assessments.

The experimental participants were referred to the UCL Speech Research Team following initial diagnosis of stuttering by a Speech and Language Therapist in their local region. All participants had previously attended an intensive therapy course (for between one and two weeks) at either the Michael Palin Centre or City University in London, with additional follow-up assessments. Treatment had been completed at least a year prior to the current assessments.

All parents (of persons under the age of 18) and adults (aged 18 years and over) had previously agreed to take part in this research study.

(ii) Test Instruments

Intelligence: The test selected for this investigation was the Raven's Standard Progressive Matrices (Raven, Raven & Court, 2004), as it was normed in the United

Kingdom, was developed for age 5 years to adulthood and required relatively less time to complete than other tests. It was also designed for use in homes, where testing conditions and levels of motivation may not be optimal for psychometric testing.

The test measures 'eductive' ability, which refers to the ability to form new insights, to discern meaning in confusion and to perceive and identify relationships, and is thus a measure of 'fluid' intelligence. It is composed of five sets, each of twelve problems, where diagrammatic puzzles exhibit serial change in two dimensions simultaneously. Each puzzle has a part missing, which must be found among the options provided. In each set the first problem is as self-evident as possible, with the following problems progressively becoming more difficult, although still based on the argument of those that have gone before. Respondents are invited to work at their own speed and no time limit is imposed. The same test is completed by all respondents, regardless of age.

The test provides each respondent with a raw score out of sixty, a discrepancy score (where a person's score for each set is compared with standardized set scores for the UK population) and a final grade. The grade reflects how a person's raw score compares with the scores obtained by a number of reference groups of the same birth cohort. The criteria for each grade are given in Table 1 below:

Table 1: Criteria for Assigning Grades in Raven's Standard Progressive Matrices (Raven, Raven & Court, 2004).

GRADE	Position of Raw Score	Classification
I	At or above 95th percentile	'Intellectually Superior'
II	At or above 75th percentile	'Definitely Above Average in Intellectual Capacity'
III	Between 25th and 75th percentiles	'Intellectually Average'
IV	Below 25th percentile	'Definitely Below Average in Intellectual Capacity'
V	Below 5th percentile	'Intellectually Impaired'

Self-Esteem: Self-esteem data for the participants had previously been collected by the UCL Speech Research Team and was made available for this investigation. Self-esteem was measured using the Harter (1985) Self-Perception Profile for Children and the Harter (1988) Self-Perception Profile for Adolescents. These profiles allow for specific judgments of competence in separate skill domains (evaluations of 'trait' self-esteem), as well as an overall perception of the participant's self-worth ('global self-worth'; an evaluation of 'state' self-esteem). In the children's version, the domains include; Scholastic Competence, Athletic Competence, Physical Appearance, Social Acceptance and Behavioural Conduct. The adolescent version is identical to the children's version, but includes three additional domains; Job Competence, Close Friendship and Romantic Appeal.

In addition, an importance rating that links directly to the separate domains is given by the participant. Participants are presented with a variety of statements, such as 'Some teenagers think it is important to be intelligent', and are asked to rate how important they consider each of these to be. The importance scores are then compared with the competence scores for each domain in order to obtain a discrepancy score. If an individual deems a domain important, but feels they are not competent in that domain (i.e. there is a negative discrepancy between the scores) it can be assumed that that person has low self-esteem in that particular domain. The discrepancy scores for each domain are then averaged to obtain a single score for each participant. This score may be considered as a more powerful indicator of general self-esteem than the global self-worth score, as it takes ratings of both competence *and* importance in domains into account.

In this study, participants aged between 11 and 14 years (n=11) completed the profile for children, and participants aged between 15 and 20 years (n=18) completed the profile for adolescents.

Bullying: A questionnaire method was employed to assess bullying experiences, as the geographical distribution of the participants prevented the practical use of other research tools. In addition, as bullying is a sensitive subject, it was hoped that the use of questionnaires might encourage honest responses, as participants could remain anonymous.

The questionnaire comprised ten questions which related to whether the participants were bullied at school, and if so, what the nature of this bullying was and

whether it was related to the participants' stuttering. In addition, the questionnaire sought to identify whether the bullying affected the participants' stuttering in any way. The participants were also asked about the nature of their friendships at school, as this was identified as a significant predictor of being bullied in the Hugh-Jones and Smith (1999) study. All questions were dependent on subjective recall. Answers were numerically coded (excluding Question 4 as this was a qualitative question) and a total mark for the questionnaire was obtained. The questionnaire and marking scheme may be found in Appendices 1 and 2, respectively. The same questionnaire was provided for all participants, regardless of age.

(iii) Procedure

45 packages were sent by post to children and adolescents on the UCL Speech Research Team's database. 29 (64%) of the participants responded within the allocated time (six weeks). All participants and parents were informed as to the purpose of the study, i.e. to look at how intelligence and bullying experiences might be related to stuttering.

Each package contained a letter explaining the purposes of the study, a copy of the Raven's Standard Progressive Matrices test and answer sheet, a copy of the bullying questionnaire and a stamped-addressed envelope. Participants were asked to return the intelligence test answer sheet and the bullying questionnaire in the stamped-addressed envelope provided. A maximum of three telephone calls were made to potential participants who did not respond approximately one month after mailing the envelopes, asking them to respond if they had the time.

All 29 participants returned the intelligence answer sheets fully completed. 27 participants returned the bullying questionnaire fully completed; one participant did not appear to realise there were two sides to the questionnaire and completed only one side (Questions 1-5), and another participant who responded 'no' to Question 1 ('were/are you ever teased or bullied at school?') did not respond to any further items, including the relevant Questions 8, 9 and 10 about school friendships.

VI. RESULTS

(i) Intelligence:

Overall, 75.8% (n=22) of respondents were 'intellectually average' and above (i.e. scored Grade III and above.). Of these, 13.8% (n=4) were 'intellectually superior', 24.1% (n=7) were 'definitely above the average in intellectual capacity' and 37.9% (n=11) were 'intellectually average.'

17.2% (n=5) were 'definitely below average in intellectual capacity' and 6.9% (n=2) were 'intellectually impaired.'

Of the recovered group (n=10), 80% (n=8) were 'intellectually average' and above; 20% (n=2) were 'intellectually superior,' 30% (n=3) were 'definitely above average' and 30% (n=3) were 'intellectually average.' 10% (n=1) were 'definitely below average and 10% (n=1) were 'intellectually impaired.'

Of the persistent group (n=19), 74% (n=14) were 'intellectually average' and above; 11% (n=2) were 'intellectually superior', 21% (n=4) were 'definitely above average' and 42% (n=8) were 'intellectually average.' 21% (n=4) were 'definitely below average' and 5% (n=1) were 'intellectually impaired.'

No significant association was found between whether a participant was above or below average in intellectual capacity and stuttering outcome (Fisher Exact Test: p=1.00, ns (two-tailed)).

The raw scores from the Raven's matrices (adjusted for age) were converted to deviation IQ scores, using a table compiled by the Dyslexia Institute (UK) (Age Norms in the Form of Standard Scores for Raven's Standard Progressive Matrices, no date), to allow further examination of the association between IQ and stuttering outcome. The recovered group (M=110.40, SD=19.22) did not show a statistically reliable difference in IQ scores from the persistent group (M=107.47, SD=17.24), t (27) = 0.42, ns (two-tailed).

(ii) Self-Esteem:

Table 2 below presents the mean and standard deviation values for the scores of the child participants in each domain (scholastic competence, social acceptance, athletic competence, physical appearance, behavioural conduct and global self-worth) and for their mean discrepancy scores. The scores are also divided according to whether the children were persistent or recovered. The Harter (1985) mean

standardised scores for children in each domain (excluding the mean discrepancy score, as no standardised value for this was available) are presented for comparison.

Table 2: Scores on the Self-Perception Profile for Children (Harter, 1985):
The standardised mean scores for each domain obtained by Harter (1985), in addition to the mean and standard deviation (*SD*) values for the participants' scores in each domain, including sub-divisions as to whether the children were recovered (RCS) or persistent (PCS).

Domain	Harter's (1985) Standardised Mean Scores	Mean (*SD*) scores for Children (*n*=11)	Mean (*SD*) Scores for RCS (*n*=6)	Mean (*SD*) Scores for PCS (*n*=5)
Scholastic Competence	2.54	2.80 (0.55)	3.08 (0.37)	2.47 (0.57)
Social Acceptance	2.97	2.83 (0.85)	2.96 (0.91)	2.67 (0.84)
Athletic Competence	2.84	2.89 (0.59)	3.11 (0.66)	2.63 (0.42)
Physical Appearance	2.84	3.08 (0.56)	2.91 (0.63)	3.30 (0.43)
Behavioural Conduct	2.95	2.85 (0.67)	2.76 (0.60)	2.97 (0.81)
Global Self-Worth	3.05	3.21 (0.51)	3.27 (0.51)	3.13 (0.57)
Mean Discrepancy Score	-	-0.54 (0.36)	-0.66 (0.30)	-0.40 (0.41)

Note. Dash indicates data not available

Table 2 shows that the mean scores for the separate domains (excluding the mean discrepancy scores) for all the children participating in this study fluctuated around the value of 2.9. The standard deviations ranged from 0.37 to 0.85, indicating a degree of variation between individuals.

No significant differences were found between the standardised scores and the mean scores for the all of the children combined on any of the six domains (excluding mean discrepancy scores).

When comparing the scores of the recovered group with the standardised scores on each domain (excluding mean discrepancy scores), the only significant difference was found in the domain of scholastic competence, where the recovered group (M=3.08, SD=0.37) scored significantly higher than the standardised score (M=2.54), t (5) = 3.60, p<0.05 (two-tailed).

When comparing the scores of the persistent group with the standardised scores with on each domain (excluding mean discrepancy scores), the only significant difference was found in the domain of physical appearance, where the persistent group (M=3.30, SD=0.43) scored marginally significantly higher than the standardised score (M=2.84), t (4) = 2.38, p<0.10 (two-tailed).

The only significant difference found between the recovered and persistent groups on their scores for each domain (including mean discrepancy scores) was in the scholastic competence domain, where the recovered group (M=3.08, SD=0.37) scored marginally significantly higher than the persistent group (M=2.27, SD=0.57), t (9) = 2.16, p<0.10 (two-tailed).

Table 3 below presents the mean and standard deviation values for the scores of the adolescent participants in each domain (scholastic competence, social acceptance, athletic competence, physical appearance, job competency, romantic appeal, behavioural conduct, close friendships and global self-worth) and for their mean discrepancy scores. The scores are also divided according to whether the adolescents were persistent or recovered. The Harter (1988) mean standardised scores for adolescents in each domain (excluding the mean discrepancy scores) are presented for comparison.

Table 3: Scores on the Self-Perception Profile for Adolescents (Harter, 1988): The standardised mean scores for each domain obtained by Harter (1988), in addition to the mean and standard deviation (*SD*) values for the participants' scores in each domain, including sub-divisions as to whether the adolescents were recovered (RAS) or persistent (PAS).

Domain	Harter's (1988) Standardised Mean Scores	Mean (*SD*) scores for Adolescents (*n*=18)	Mean (*SD*) Scores for RAS (*n*=4)	Mean (*SD*) Scores for PAS (*n*=14)
Scholastic Competence	2.82	3.09 (0.63)	3.00 (1.07)	3.11 (0.51)
Social Acceptance	3.03	3.19 (0.70)	2.95 (1.00)	3.26 (0.63)
Athletic Competence	2.72	2.56 (0.66)	2.85 (0.30)	2.47 (0.72)
Physical Appearance	3.03	2.94 (0.66)	2.55 (0.77)	3.05 (0.61)
Job Competency	3.14	3.16 (0.69)	3.00 (1.14)	3.20 (0.56)
Romantic Appeal	2.53	2.62 (0.64)	2.50 (0.62)	2.66 (0.67)
Behavioural Conduct	2.80	3.09 (0.45)	3.05 (0.44)	3.10 (0.47)
Close Friendships	3.24	3.18 (0.90)	2.95 (1.42)	3.24 (0.76)
Global Self-Worth	3.00	3.19 (0.64)	3.20 (0.85)	3.19 (0.61)
Mean Discrepancy Score	-	-0.36 (0.39)	-0.76 (0.61)	-0.25 (0.22)

Note. Dash indicates data not available

Table 3 shows that the mean scores for the separate domains (excluding the mean discrepancy scores) for all the adolescents participating in this study fluctuated

around the value of 3.0. The standard deviations ranged from 0.30 to 1.42, indicating a large amount of variation between individuals.

When comparing the adolescent participants combined and the standardised scores for each domain (excluding mean discrepancy scores), the only statistically significant differences were found in the scholastic competence and behavioural conduct domains. The adolescent participants combined (M=3.09, SD=0.63) scored marginally significantly higher than the standardised score for scholastic competence (M=2.82), t (17) = 1.80, p<0.10 (two-tailed). The adolescent group (M=3.09, SD= 0.45) also scored significantly higher than the standardised score for behavioural conduct (M=2.80), t (17) = 2.72, p<0.05 (two-tailed).

No significant differences were found when comparing the scores of the recovered group with the standardised scores for the nine domains (excluding mean discrepancy scores).

When comparing the scores of the persistent group with the standardised scores for each domain (excluding mean discrepancy scores), the only significant differences were found in the scholastic competence and behavioural conduct domains. The persistent group (M=3.11, SD=0.51) scored significantly higher than the standardised score for scholastic competence (M=2.82), t (13) = 2.17, p<0.05 (two-tailed). The persistent group (M=3.10, SD=0.47) again scored significantly higher than the standardised score for behavioural conduct (M=2.80), t (13) = 2.39, p<0.05 (two-tailed).

The only significant difference between the persistent and recovered adolescent groups on their scores for each domain (including mean discrepancy scores) was found in the mean discrepancy scores. The persistent group (M=-0.25, SD=0.22) produced significantly smaller mean discrepancy scores than did the recovered group (M=-0.76, SD=0.61), t (16) = -2.71, p<0.05 (two-tailed).

Comparing the general self-esteem of persistent and recovered participants:

Combining both the children and adolescents together, the recovered group (M= -0.70, SD= 0.42) produced significantly larger mean discrepancy scores than the persistent group (M= -0.29, SD= 0.28), t (13) = -2.77, p<0.05 (two tailed), indicating lower general self-esteem.

(iii) Bullying:

Details of the principal findings from each item on the questionnaire are provided below. The number of participants who responded to each item is given in brackets following the item.

Question 1: Were/ are you ever teased or bullied at school? (N=29)

69% (n=20) responded 'yes' (5 females and 15 males); 31% (n=9) responded 'no' (4 females and 5 males). No association was found between the sex of the respondent and whether or not they had been bullied at school (χ^2 (1, N=29) =1.10, ns).

Of those who responded 'yes' (n=20), 35% (n=7) were recovered stutterers and 65% (n=13) were persistent. Of those who responded 'no' (n=9), 33.3% (n=3) were recovered stutterers and 66.7% (n=6) were persistent. No association was found between whether or not a person was bullied at school and stuttering outcome (χ^2 (1, N=29) = 0.008, ns).

Question 2: What form did/does the bullying take? (n=20)

Table 4 below presents the percentage of participants who, having replied 'yes' to Question 1 (n=20), responded to each answer to Question 2.

Table 4: The Percentage of Participants who Responded to Each Answer to Question 2.

Form of Bullying Experienced	Percentage (n)
Name Calling	80 (16)
Rumour Spreading	20 (4)
Threats	10 (2)
Physical Bullying	25 (5)
Property Stolen	5 (1)
Being Left Out by Your Friends	30 (6)

Table 4 indicates that the most common form of bullying experienced by participants was 'name calling,' although all forms of bullying had been experienced by at least one participant.

***Question 3: Was/is the bullying directly related to your stammering?* (*n*=20)**

Table 5 below presents the regularity with which participants reported that the bullying they experienced was related to their stammer.

Table 5: The Percentage of Participants who Responded to Each Answer to Question 3.

Answer	Percentage (*n*)
Always	10 (2)
Very Often	20 (4)
Sometimes	30 (6)
Occasionally	20 (4)
Never	20 (4)

Table 5 indicates that the modal response to Question 3 was that the bullying experienced by participants was 'sometimes' directly related to the stammering.

***Question 4: How old were/are you when the bullying was/is at its worst?* (*n*=20)**

Table 6 below presents the ages at which participants reported that the bullying was at its worst.

Table 6: The Age Ranges that Participants Reported in Answer to Question 4.

Age range (years)	Percentage (*n*)
4-5	0 (0)
6-7	15 (3)
8-10	25 (5)
11-13	45 (9)
13+	15 (3)

The mean average age at which participants reported that the bullying was most severe was 10.82 years, with a standard deviation of 2.42.

Question 5: At the time of bullying, how often did it/does it occur? (n=20)

Table 7 below expresses the regularity of the bullying reported to be experienced by participants.

Table 7: The Percentage of Participants who Responded to Each Answer to Question 5.

Answer	Percentage (*n*)
Every Day	5 (1)
Few Times a Week	65 (13)
Once a Week	10 (2)
Few Times a Month	15 (3)
Once a Term	5 (1)

Table 7 indicates that the modal response to Question 5 was that the bullying reported to be experienced by participants occurred a 'few times a week.'

***Question 6: Did/does the bullying have an effect on your stammering?* (*n*=19)**

58% (*n*=11) of the participants who were bullied responded 'yes' and 42% (*n*=8) responded 'no' to this question.

Of those who responded 'yes,' 16% (*n*=3) were recovered participants and 42% (*n*=8) were persistent. Of those who responded 'no,' 16% (*n*=3) were recovered and 26% (*n*=5) were persistent. No significant association was found between whether the bullying did or did not have an effect on stammering and stuttering outcome (Fisher Exact Test: p=1.00, ns (two-tailed)).

***Question 7: If yes, how much did/does the bullying affect your stammering?* (*n*=11)**

Table 8 below represents the relative degrees of severity with which participants (who replied 'yes' to Question 6, *n*=11) reported that the bullying affected their stammer.

Table 8: The Percentage of Participants who Responded to Each Answer to Question 7.

Answer	Percentage (*n*)
Very Severely	9 (1)
Quite Severely	9 (1)
Moderately	55 (6)
A Little	27 (3)
Not Much At All	0 (0)

Table 8 shows that the modal response to Question 7 was that the bullying had a 'moderate' effect on the participants' stammering, if any effect existed.

***Question 8: How many close friends did/do you have at school?* (*n*=27)**

Table 9 below presents the number of close friends participants reported having.

Table 9: The Percentage of Participants who Responded to Each Answer to Question 8.

Answer	Percentage (*n*)
0	0.0 (0)
1-2	18.5 (5)
3-4	26.0 (7)
5-6	18.5 (5)
7+	37.0 (10)

Table 9 shows that the modal response to Question 8 was that the participants had 'seven or more' friends. 27 participants answered both Questions 1 and 8. Of those who reported having between 1 and 4 friends (*n*=12), 100% reported having been bullied. Of those who reported having 5 or more friends (*n*=15), 46.7% (*n*=7) reported being bullied and 53.3% (*n*=8) reported that they were not bullied.

***Question 9: Did you/ do you find it hard to make friends at school?* (*n*=27)**

Table 10 below presents the regularity with which participants found it hard to make friends, if at all.

Table 10: The Percentage of Participants who Responded to Each Answer to Question 9.

Answer	Percentage (*n*)
Always	15 (4)
Very Often	11 (3)
Sometimes	11 (3)
Occasionally	30 (8)
Never	33 (9)

Table 10 shows that the modal response to Question 9 was that participants 'never' found it hard to make friends. 27 participants answered both Questions 1 and 9. Of those who reported that it was 'sometimes', 'very often' or 'always' hard to make friends (n=10), 100% reported having been bullied. Of those who reported that it was 'occasionally' or 'never' difficult to make friends (n=17), 52.9% (n=9) reported having been bullied and 47.1% (n=8) reported that they were not bullied.

***Question 10: If so, was/is this related to your stammer?* (n=18)**

Of those who responded to Question 9 with 'always,' 'very often,' 'sometimes' or 'occasionally' (n=18), 72% (n=13) responded 'yes' and 28% (n=5) responded 'no' to Item 10.

Comparing the bullying experiences of persistent and recovered participants:

The recovered group (M=7.50, SD=5.87) did not show a statistically reliable difference in total scores on the bullying questionnaire (excluding Question 4, as this was qualitative in nature) from the persistent group (M=9.68, SD=7.37), $t(27) = -0.81$, ns (two tailed).

(iv) Predicting Persistence or Recovery using IQ, Self-Esteem and Bullying Scores.

Logistic regression was employed to predict the discrete outcome of persistence or recovery in stuttering from a set of seven predictor variables. The variables included IQ (represented by the deviation IQ scores described above), self-esteem (represented by the global self-worth scores obtained from the Harter Self-Perception Profiles (1985, 1988), as the mean discrepancy scores were not statistically compatible), experiences of being bullied (represented by the total scores obtained from the bullying questionnaires, excluding question 4), and their respective combinations (intelligence/self-esteem, intelligence/bullying, self-esteem/bullying and intelligence/self-esteem/bullying). Recovery or persistence was indicated by a score of either 0 or 1, respectively.

Logistic regression analysis involves the testing of models to obtain the best fit for the data; the logistic regression model is compared with a 'baseline' model by computing the difference in their log-likelihood and using chi-square. In the baseline model, nothing other than the values of the outcome is known and the model predicts

the outcome that occurs most often, which in this study would be persistence (the case for 19 out of 29 participants). Odds ratios of being in one category rather than another (when the value of the predictor increases by one unit) are provided.

The logistic regression analysis was performed on SPSS 11.0 using a forced entry method. The analysis failed to produce any significant predictors of persistence/recovery. The results of the analysis for the three main variables of IQ, self-esteem and bullying can be found in Table 11 below.

Table 11: Summary of Logistic Regression Analysis for Variables Predicting Persistence or Recovery in Stuttering (*N*=29).

Variable	Logistic Regression Coefficient (LRC)	Standard Error of LRC	Odds Ratio	95% Confidence Intervals for Odds Ratio	*p* value
IQ	-0.007	0.024	0.993	0.948-1.040	0.750
Self-Esteem	-0.069	0.737	0.933	0.220-3.956	0.485
Bullying	-0.045	0.064	1.046	0.923-1.185	0.925

Table 11 presents the main results from the logistic regression analysis and shows that IQ, self-esteem and bullying experiences were not significantly associated with persistence or recovery in this sample of participants who stutter (as indicated by the non-significant *p* values).

VII. DISCUSSION

(i) Intelligence

The prediction that people who stutter are not generally less intelligent than their non-stuttering peers (Hypothesis 1) was supported; 75.8% of participants were considered 'intellectually average' and above. Furthermore, the participants' self-esteem scores for scholastic competence were either average (for the children), or greater than average (for the adolescents), indicating that the people who stutter in this sample did not generally have a negative view of their intellect.

These findings are in contrast to those of Andrews and Harris (1964), Schindler (1955), Johnson et al., (1942) and Okasha et al. (1974), who all reported that people who stutter presented a lower IQ than fluent participants. This contrast may have resulted from the use of a strictly non-verbal instrument to measure the intelligence of those who stutter. In previous studies, there was only a small difference between the mean intelligence scores of the stuttering and fluent groups, therefore a more sensitive instrument, such as the Raven's Matrices, may have eliminated any effects due to confounding variables.

In support of this speculation, Flynn (1987) questioned whether any between-group differences observed on IQ tests actually reflected true intelligence differences, or whether they were merely the result of measurement artefact, such as altered test taking strategies or heightened test sophistication. This debate followed from Flynn's (1987) documentation of worldwide increases in scores on standardised intelligence tests (now termed 'the Flynn effect').

Alternatively, it may be that the increases in intelligence test scores observed by Flynn (1987) did indeed reflect a genuine increase in intelligence, perhaps due to improvements in general nutrition (Martorell, 1998), education (Husén & Tuijnman, 1991) or due to greater environmental complexity (Schooler, 1998). It may therefore be that the difference in IQ between stuttering and fluent subjects observed in previous studies did exist, but has now disappeared due to an increase in general intelligence.

Contrary to the prediction that the persistent group would have a lower average intelligence than the recovered group (Hypothesis 2), as a result of the suggested association between brain damage and IQ problems (Andrews & Harris, 1964), no significant association was found between IQ and stuttering outcome. This

finding, together with the finding of no significant difference in IQ between the stuttering participants and fluent norms, suggests that brain damage is not likely to be an explanation for any previous differences observed between the IQ scores of stuttering and fluent groups.

An alternative explanation of the present findings may lie in the fact that all of the participants in this study had attended speech and language therapy, therefore the results may again reflect the influence of intelligence on access to healthcare, as was suggested by Andrews and Harris (1964), Cox (1982) and Furnham and Davis (2004).

(ii) Self-Esteem

The prediction that the participants who stutter would have lower than average self-esteem (Hypothesis 3) was not supported. The results showed that neither the children's nor the adolescents' general self-esteem was significantly different from average, as evidenced by the global self-worth scores, which represent the individual's general perception of their competencies, irrespective of how important they consider these competencies to be. Unfortunately, mean discrepancy scores were not available for the standardised data, which take ratings of both competence *and* importance in domains into account, and are therefore more powerful indicators of self-esteem than the global scores alone. The participants' mean scores in each of the separate skill domains were also similar to standardised domain scores; if a significant difference existed, the participants' mean score in the relevant domain was always greater than the mean standardised score.

These findings support results obtained by Blood et al. (2003) and Yovetich et al. (2000), who found no difference on measures of self-esteem between people who stutter and normative data. Yovetich et al. (2000) suggested that factors other than stuttering must therefore play an important role in the development of the self-esteem of people who stutter. It was also suggested that certain strategies may be used by people who stutter to preserve self-esteem, such as 'discounting', where individuals realise they are not as strong in a particular domain and therefore discount the importance of that area in order to maintain their self-worth. Blood et al. (2003) suggested that further strategies may be used by people who stutter to reduce the perceived stigma of stuttering, thereby maintaining a high self-esteem. These included comparing themselves to members of their own social group rather than with a non-

stigmatised group or attributing negative feedback to the fact that they belong to a stigmatised group rather than to their own personal characteristics.

The prediction that recovered people who stutter would have higher self-esteem than persistent people who stutter (Hypothesis 4) was not supported. The recovered group produced significantly larger mean discrepancy scores than did the persistent group. This indicates that the importance attributed to particular domains by the recovered group was generally greater than their perceived competencies in them, resulting in lower self-esteem. It may be the case that the persistent participants have undergone longer periods of therapy than the recovered participants, who presumably ceased therapy after being diagnosed as recovered. If the more extensive therapy sessions directly targeted self-esteem, they may have had a more positive impact on the persistent stutterers' feelings of self-worth, and may have encouraged the use of strategies such as discounting, which would result in smaller mean discrepancy scores.

This is an important finding, as it shows that even if people have recovered from their stutter, there may be long-term psychological consequences that require attention and support. Thus a multi-disciplinary approach for recovered people who stutter would be beneficial, where psychologists are recruited to target this apparent discrepancy between importance and competence in certain domains, and any other negative thoughts or behaviours resulting from a previous stutter.

(iii) Bullying

The prediction that a high incidence of bullying would be found amongst people who stutter (Hypothesis 5) was supported. It was found that over half (69%) of the people who stutter in this sample reported that they were bullied at some time in their school career. However, the prediction that recovered people who stutter would have experienced less bullying than those who were persistent (Hypothesis 6) was not supported; whether or not a person was bullied at school was not significantly associated with stuttering outcome, and no significant association was found between total scores on the bullying questionnaire and stuttering outcome.

In addition, further to the studies of Mooney and Smith (1995) and Hugh-Jones and Smith (1999), which found that bullying had a negative impact on the speech difficulties of persistent people who stutter, this study revealed that bullying also had an effect on the dysfluency of recovered people who stutter. It was found that

58% of participants, both recovered and persistent, reported that the bullying negatively affected their stutter, with 73% of these respondents reporting at least a 'moderate' effect. No significant association was found between whether the bullying did or did not affect the participants' stuttering and whether a person was persistent or recovered.

It was also found that 80% of participants reported that the bullying experienced was at least 'occasionally' related to their stutter. Name-calling appeared to be the most common form of bullying, and the bullying was reported to be most severe around 10 years of age. It was most commonly experienced by participants a few times a week. The sex of the participant was not significantly associated with whether or not the participant was bullied.

The percentage of participants bullied in this sample appears higher than some estimates of bullying amongst non-stuttering young people; for example, findings from a 2001/02 cross-national survey carried out by the World Health Organisation (WHO) showed that from a sample of 6,423 schoolchildren in England aged between 11 and 16 years, 34% reported being bullied (Morgan, Malam, Muir & Barker, 2006). The WHO survey in Scotland revealed that only 8.4% of 4,404 school children of the same age range were regular victims of bullying (Todd, Currie, Mellor, Johnstone & Cowie, 2004).

The lower percentages reported in the Todd et al. (2004) and the Morgan et al. (2006) studies may reflect the fact that in the former, 'regular victims' represented a person being bullied at least two times a month, and in the latter, the percentages reported reflected those young people bullied at least once in the last two months. In contrast, the present study asked whether a person had been bullied at any point during their time at school. A study conducted in Scotland by Mellor (1990) of 942 secondary school pupils revealed that a greater figure of 50% of children reported that they had been bullied at least once during their school careers.

The percentage of bullying reported in this study (69%) is however closer to other estimates of the incidence of bullying amongst young people who stutter; the retrospective accounts of bullying in the Hugh-Jones and Smith (1999) and the Mooney and Smith (1995) studies revealed that 83% and 82%, respectively, of respondents reported having been bullied at some time during their school career.

Thus bullying appears to be very common amongst those who stutter. Hugh-Jones and Smith (1999) found that it was not the stuttering that directly predicted the

risk of being bullied, but the dysfluent children's difficulty in making friends. The authors suggested that even if a person who stutters *has* formed friendships, these may be less satisfactory and their friends may, like themselves, tend to have low sociometric status in their social group. This is supported by Davis et al. (2002), who found that people who stutter were rejected significantly more often than their fluent peers and were significantly less likely to be popular.

In the present study, it was found that 100% of the young people who had only between one and four close friends were bullied, and that 100% of participants who 'always', 'very often' or 'sometimes' found it difficult to make friends reported being bullied. Thus, as Hugh-Jones and Smith (1999) observed, difficulties in making friends may be the true reason why a young person is victimised, even if the bullying is directed at the individual's dysfluent speech.

Further investigation is required to reveal why people who stutter have difficulty making friends. Of those participants in this study who said it was at least 'occasionally' hard to make friends, 72% reported that this was directly related to their stutter. However, intermediate factors may also influence this relationship; for example, Davis et al. (2002) suggested that young people who stutter are often reluctant to participate verbally in social groups, which may result in them appearing shy or withdrawn and therefore having difficulties forming friendships.

These results demonstrate that further support in schools for young people who stutter is required, which is not only directed at how to cope with bullying behaviour, but also at building confidence to participate in social groups and to develop friendship-making strategies. In this way, peer support may serve as a buffer against bullying.

(iv) Predicting Persistence or Recovery

The prediction that self-esteem and experiences of being bullied would interact to predict recovery or persistence in stuttering when intelligence was controlled for (Hypothesis 7) was not supported. The logistic regression results showed that when looked at together, intelligence, self-esteem and experiences of being bullied did not significantly predict stuttering outcome. However, this conclusion is based on a small sample size and it may be that one or more of these variables is a significant predictor of persistence or recovery in a larger sample.

Alternatively, it may be that unmeasured psychosocial variables determine persistence or recovery in an individual who stutters. For example, Furnham and Davis (2004) suggested that personality traits such as anxiety levels, introversion/extraversion, attitudes to verbal communication and/or temperament are related to stuttering. These traits may also be found to influence persistence or recovery in future research.

(v) Limitations and Future Work

General: The small sample size of participants may limit the extension of the findings of this study to the general stuttering population in the United Kingdom. It should, however, serve as a useful basis from which to conduct a much more extensive survey, where more definitive conclusions may be drawn.

Intelligence: There is some debate as to whether Raven's Progressive Matrices (RPM) scores should be converted to deviation IQ scores. Raven (2000) stated that presenting deviation IQ scores with a mean of 100 and a standard deviation of 15 is not appropriate for the RPM, as the within-age score distributions are not Gaussian and are often bi-modal. However, it was not possible to use the raw scores obtained from the Raven's matrices in statistical analyses, as these were not adjusted for age. Alternative non-verbal assessment instruments may have generated a more suitable score, however these were not normed in the UK and their use would therefore not have been appropriate for the participants in this study.

Further studies of intelligence and stuttering should involve participants who have not attended speech and language therapy, as well as those who have, in order to resolve the question of whether the participants who stutter in this study were generally of above average intelligence because healthcare is more available to this cohort. Furthermore, this would allow investigation into whether therapy is indeed a factor that affects persistence or recovery in stuttering, thus examining the conclusions of Kalinowski et al. (2005), Onslow et al. (1994), Lincoln and Onslow (1997) and Craig et al. (1996), regarding the efficacy of speech therapy.

Self-Esteem: Information on the nature of therapy received by participants in the present study was not obtained. It is possible that any therapy received may have directly targeted self-esteem or may have encouraged the development of coping strategies such as those suggested by Yovetich et al. (2000) and Blood et al (2003), which may have affected the participants' self-worth scores.

Information on the nature of the severity of the participants' stutter was also not obtained. Bloodstein (1995) suggested that the more severe the stutter, the lower self-esteem would be. Yovetich et al. (2000) further hypothesised that low self-esteem issues related to stuttering may not be present in an individual until after they reach the stage of an advanced stutterer in Bloodstein's (1995) categories. It may be that the participants in the present study only had mild stutters, thereby leading to a more positive self-esteem.

Yovetich et al. (2000) conceded that their self-esteem instrument did not *directly* assess how stuttering affects the individual's self-esteem, and suggested that stuttering may become a clinical issue relative to self-esteem only when questions directly assess the problem. The Harter Profiles (1985, 1988) used in the present study also did not include specific questions about stuttering and may therefore have been subject to the same problem

For future studies, it would therefore be important to gain information about the nature of therapy received and the severity of the participants' stutter (using Bloodstein's (1995) developmental categories, for example) in order to determine whether self-esteem scores are indeed influenced by these variables. In addition, it would be important that future researchers develop a self-esteem instrument that specifically asks questions regarding how a person's stutter influences their feelings of self-worth.

Bullying: Standardised questionnaires about the bullying experiences of people who stutter are not currently available, therefore a uniquely designed questionnaire was employed in this study. The questionnaire was consequently neither standardised nor validated, therefore future work may be directed at this undertaking, in order to provide researchers with a valid tool for assessing the precise relationship between bullying and stuttering.

In addition, the questionnaire relied on the participants' recollections of being bullied, which may be distorted and there is no way to confirm the responses. Using observational data from participant's parents, teachers or peers may have improved reliability. However, ratings for bullying might differ greatly between such observers, thus in order to obtain a comprehensive description of the participants' experiences of being bullied, it was necessary to ask the participants directly. Furthermore, with the eldest respondent being 20 years of age, many of the respondents were still at school,

or had only recently left, therefore the issue of long-term recall distortions was not especially prominent.

Predicting Persistence or Recovery: A larger sample of participants is required to establish whether there are any significant relationships between intelligence, self-esteem, experiences of being bullied and persistence/recovery, as the sample investigated in this study was not large enough to detect any such associations.

In addition, it is crucial to determine whether other psychosocial factors, such as personality or behavioural traits, significantly influence stuttering outcome. It may also be that these factors interact in some way with intelligence, self-esteem and/or experiences of being bullied in order to significantly predict persistence or recovery.

With a greater amount of data it would be possible to use structural equation modelling (SEM) to identify the variables which are causally related to either persistence or recovery in stuttering. SEM is a collection of statistical techniques integrating path analysis and factor analysis. It is a very powerful tool for hypothesis testing, as it allows the comparison of alternative theories in order to establish a model (a statistical statement about the relationships between variables) that best accounts for the data (Levine, Petrides, Davis, Jackson & Howell, 2005). Thus, a robust model for stuttering could be created, which would allow researchers to identify the factors present at the onset of stuttering which influence eventual stuttering outcome. In this way, speech and language pathologists would be able to focus therapy on the significant factors identified, in order to maximise the chances of recovery from stuttering.

VIII. CONCLUSIONS

This has been the first study to examine the psychosocial variables of intelligence, self-esteem and experiences of bullying in the same group of individuals who stutter, and to examine the influence of these variables on persistence and recovery. Although the small sample size limits any definitive conclusions, this investigation found that the intelligence and self-esteem (when measured by the competency scores in particular skill domains) of people who stutter, both persistent and recovered, were not significantly below the average for fluent people. However, it was found that the incidence of bullying in schools experienced by people who stutter was generally much higher than estimates of the bullying experienced by fluent young people.

No significant difference in average intelligence or bullying experiences was found between persistent and recovered people who stutter. However, the self-esteem of the recovered participants was significantly lower than that of the persistent participants, when measured by the mean discrepancy between competence and importance scores in particular skill domains.

Logistic regression analysis failed to identify a combination of intelligence, self-esteem and/or experiences of being bullied as significantly predicting persistence or recovery. Thus knowing their values at the onset of stuttering would not appear to allow prediction of eventual stuttering outcome. However, further investigation with a larger sample of people who stutter into these and other possible psychosocial factors affecting stuttering is required, in order to construct a predictive model for persistence and recovery that would be of benefit in directing the therapy and support offered to people who stutter.

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X. APPENDICES

(i) APPENDIX 1: The questionnaire used to assess the bullying experiences of people who stutter.

Stammering and Bullying Questionnaire

Please circle the appropriate answer

1. **Were you/ are you ever teased or bullied at school?**

   Yes No

2. **What form did/does the bullying take?**

   Name calling *Rumour spreading* *threats*

   Physical bullying (e.g. being hit or pushed) *property stolen*

   Being left out by your friends

3. **Was/is the bullying directly related to your stammering?**

   Always very often sometimes occasionally never

4. **How old were/are you when the bullying was/is at its worst (years)?**

   _____

5. **At the time of the bullying, how often did it/does it occur?**

   Every day *few times a week* *once a week* *few times a month*

   once a term

6. **Did/does the bullying have an effect on your stammering?**

   Yes *No*

7. **If yes, how much did/does the bullying affect your stammering?**

   Very severely quite severely moderately a little

   not much at all

8. **How many close friends did you/do you have at school?**

   0 *1-2* *3-4* *5-6* *7+*

9. **Did you/ do you find it hard to make friends at school?**

   Always very often sometimes occasionally never

10. **If so, was/is this related to your stammer?**

    Yes *No*

(ii) APPENDIX 2: Marking scheme for the Stammering and Bullying Questionnaire. The number in each box represents the score allocated for each answer. The scores for each item were then added together to give a total score for the questionnaire.

1. Were you/ are you ever teased or bullied at school?

Yes	*No*
1	0

2. What form did/does the bullying take?

Name calling *Rumour spreading* *threats*

Physical bullying (e.g. being hit or pushed) *property stolen*

Being left out by your friends

One point for each answer circled. Points added together for total score for Question 2.

3. Was/is the bullying directly related to your stammering?

Always	very often	sometimes	occasionally	never
4	3	2	1	0

4. How old were/are you when the bullying was/is at its worst (years)?

_____

Qualitative question, no score allocated.

5. At the time of the bullying, how often did it/does it occur?

Every day	*few times a week*	*once a week*	*few times a month*
4	3	2	1

once a term
0

6. **Did/does the bullying have an effect on your stammering?**

Yes	*No*
1	0

7. **If yes, how much did/does the bullying affect your stammering?**

Very severely	quite severely	moderately	a little	not much at all
4	3	2	1	0

8. **How many close friends did you/do you have at school?**

0	*1-2*	*3-4*	*5-6*	*7+*
4	3	2	1	0

9. **Did you/ do you find it hard to make friends at school?**

Always	very often	sometimes	occasionally	never
4	3	2	1	0

10. **If so, was/is this related to your stammer?**

Yes	*No*
1	0