Prevalence of stuttering

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SUMMARY The prevalence of stuttering in a university population was 2.1%; 3.4% were former stutterers. More men than women stuttered. Right handed female stutterers were less likely to have “lost” their stutter than were right handed males. Stutterers, past stutterers, and questionable stutterers all had a family history of stuttering. The significant prevalence of stuttering, the increased prevalence among males, the lack of a decline of this disorder over the past few decades despite the increased number of speech clinicians and data concerning handedness, emphasise the need to investigate organic causes of stuttering.

The aetiology of stuttering is unresolved. Many contend that the various speech therapies used in recent years have decreased the number of stutterers. We investigated the prevalence of stuttering in an adult population, and examined the correlation with handedness, sex, and family history. These topics have not been evaluated recently (Sheehan and Martin, 1966). Many evaluations of the prevalence of stuttering were by speech clinicians who examined individuals briefly and often missed mild stutterers (Daniels, 1940). Questionnaires frequently asked whether or not individuals “ever stuttered when they talked,” a question yielding a false higher yield than asking whether or not the individual “is or has been a stutterer” (Bloodstein, 1969).

Subjects and methods

A written questionnaire was administered to 2200 subjects; 78 refused to reply, and 15 failed to indicate sex or handedness or both. These subjects were excluded, leaving 2107 subjects for study. Eleven failed to indicate whether there was a family history of stuttering (see below). The median age was 20.8 years, and the median period of education was 14.2 years. There were 1147 men (54%) and 918 women (46%). Seventy (3%) were mixed handed, 231 (11%) left handed, and 1806 (86%) right handed.

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The survey was conducted at the University of Massachusetts (Amherst Campus). Students were approached while waiting in queues for various administrative purposes. They were asked about their sex, age, highest grade completed, family history of stuttering, and whether they were or had been stutterers. They were also asked about handedness—right, left, or mixed—and whether they had been forced to change handedness. Questions concerning handedness were intentionally simple to keep the questionnaire brief enough to encourage co-operation.

Subjects were divided into four categories—stutterers, past stutterers, non-stutterers, and questionable stutterers. The latter group was added after the survey, to indicate individuals who stuttered occasionally or under specific circumstances (for example, fatigue, alcohol, marijuana smoking). Because of the small numbers of subjects in the stuttering categories, we combined left and mixed handedness under the category of non-right handedness.

Results

Forty-four subjects (2.1%) were stutterers, 71 (3.4%) were former stutterers, and 27 (1.3%) were questionable stutterers (see above).

The interaction between sex and stuttering (Table 1) was significant ($\chi^2=16.9$, $P<0.001$, df3). In the stutterer and past stutterer categories, there were more men than women than would be expected if sex were independent. This effect was determined by a significant interaction of handedness, sex, and stuttering categories ($\chi^2=21.8$, $P<0.01$, df9). The distribution of non-right handed

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Table 1 Interaction between stuttering category and sex ($\chi^2=16.9$, $P<0.001$) and handedness ($\chi^2=21.8$, $P<0.01$)

Stuttering category	Men: right handed	Men: non-right handed	Women: right handed	Women: non-right handed
Non-stutterers	896* (914.0)†	151 (155.7)	794 (770.3)	124 (125.0)
Stutterers	24 (20.5)	7 (3.4)	11 (17.2)	2 (2.8)
Past stutterers	47 (33.0)	7 (5.6)	13 (27.8)	4 (4.5)
Questionable stutterers	13 (12.6)	2 (2.1)	8 (10.6)	4 (1.7)

*Frequency observed.

†Frequency expected.

males and females was independent of the stuttering factor. There were more right handed males who considered themselves stutterers or past stutterers than expected; but there were fewer right handed females who considered themselves stutterers or past stutterers than expected. This trend appears stronger among past than present stutterers. Right handed questionable stutterers performed as expected, but right handed non-stutterers showed the trend opposite to that of right handed stutterers and past stutterers.

We examined family history and forced change of handedness (Table 2). There was a significant interaction between family history and stuttering ($\chi^2=63.9$, $P<0.001$, df3). Stutterers, past stutterers, and questionable stutterers reported a greater history than would be expected of an independent variable. Too few (15) subjects reported that they had been forced to change handedness to permit meaningful analysis.

No interaction was found in either age or education with any subsequent grouping of the data.

Discussion

The prevalence of stuttering and various aspects of handedness, sex, and family history are well summarised elsewhere (Heltman, 1940; Sheehan,

Table 2 Interaction between stuttering category and family history of stuttering ($\chi^2=63.9$, $P<0.001$)

Stuttering category	Family history of stuttering	No family history of stuttering
Non-stutterers	99* (120)†	1866 (1845)
Stutterers	13 (2.7)	31 (41.3)
Past stutterers	9 (3.7)	51 (56.3)
Questionable stutterers	7 (1.6)	20 (25.4)

*Frequency observed.

†Frequency expected.

1970; Milisen, 1971). The prevalence of stuttering in an adult population has been estimated at 1%; in childhood it is approximately 4%. The relationship between stuttering and handedness, shift of handedness, and inheritance is unresolved (Daniels, 1940; Heltman, 1940; Johnson, 1955; Sheehan, 1970).

The prevalence of stuttering in our adult population was 2.1%. This contradicts other studies (Blanton, 1921, 6%; Morley, 1952, 1%), and may reflect a possible socioeconomic element (Morgans, 1956; Lemert, 1970). It is uncertain whether the state university used in our study reflects a socioeconomic bias.

Of our subjects 3.4% considered themselves former or "cured" stutterers. We do not know whether these individuals had speech therapy.

We noted an increased prevalence of stuttering among males and an increased prevalence of males among past or cured stutterers. This is consistent with the thesis that stuttering is more common among males and that females have a smaller chance of losing, or being "cured" of, a stutter than do males.

The increased prevalence of right handed males among stutterers was even more pronounced among past stutterers. A right handed female stutterer had less chance of losing her stutter than did a right handed male. A male stutterer has a better chance of losing his stutter if he is right handed. One might postulate that he, therefore, has less of a chance of having bilateral speech representation than his non-right handed counterpart. Many (Orton, 1928; Travis and Knott, 1937; Jones, 1966) contend that stutterers have bilateral cerebral speech representation underlying their stutter. However, were this true, there should be an increased prevalence of stuttering among left handed individuals; it seems there is not (Daniels, 1940).

All categories of stutterers had a positive family history of stuttering. "Questionable stuttering" may not be a statistical artefact (see above) and this would mean that almost 7% of our population were or had been afflicted by stuttering.

The impressive prevalence of stuttering, the increased prevalence among men, the lack of a decline of this disorder over the decades despite the increased number of speech clinicians, and the other data concerning handedness encourage us to explore further the possibility of a partial organic matrix behind the enigma of stuttering.

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