

# UCL survey of bilingualism and stuttering

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## INTRODUCTION

Whether learning a second language affect stuttering is a frequently asked question but with no definitive answer. People asking this question include researchers, therapists and parents of children who stutter. Some parents who wish to introduce a second language to a young child would also want to know if that would affect their child's first language development (see <http://www.kidsource.com/ASHA/bilingual.html>). Therapists would be interested to know if they should advise bilingual children who stutter to stop using their L2 if it is interfering with their language development and fluency. For us, the researchers, there is evidence that first and second languages (L1 and L2) are processed differently in the brain depending on the proficiency and the age of acquisition of L2 (Perani et al., 1998). If there is a relationship between bilingualism and stuttering, we would want to know if the same brain structure known to affect bilingualism is also responsible for stuttering.

There are sporadic case studies of bilingual speakers who stutter (Bernstein Ratner & Benitez, 1985; Jankelowitz & Bortz, 1996; Jayaram, 1983). These studies involved cross linguistic analysis on bilingual speakers who stutter. The relationship between bilingualism and stuttering can only be established with a survey or a longitudinal study of a large population. The only known survey to date on the topic was carried out in the 30s by Travis, Johnson and Shover (1937). Travis et al. surveyed 4827 children aged between four and seventeen years (mean age 8.54 years) and found that there was a higher percentage of children who stutter in the bilingual population surveyed (2.8%) than in the monolingual population (1.8%). Research in both fields since then has provided a lot more information about both stuttering and bilingualism. In this paper the results of a survey that we have been carrying out on bilingualism and stuttering since February, 1999, were reported.

## INTERNET SURVEY

### *Carrying out the survey on WWW*

The study has been carried out mainly through the internet and the webpage is located at: <http://www.speech.psychol.ucl.ac.uk/survey1/bilingual.html>. Paper versions of the test have also been used when requested by the respondents. The results reported here included responses from 794 individuals who filled in the questionnaire (as of May 2000). An update on the results is also posted on the internet at: <http://www.speech.psychol.ucl.ac.uk/survey1/update.html>. The survey is one of the four developmental psychology tests listed in the American Psychological Society list of Psychological Research (<http://psych.hanover.edu/APS/exponnet.html>) maintained by John Krantz whose work is described in the new book on internet psychological research by Birnbaum (2000).

There are pros and cons for conducting survey on the internet (Krantz, Ballard & Scher, 1997; Schmidt, 1997; Supovitz, 1999). Biases are unavoidable in all survey and especially for survey carried out through the internet. It has been reported that most internet users are white, male and from the western world. For our survey, responses were mostly received from the western world but mostly from females. Invitations were sent out to different groups of people to fill in the questionnaire. Messages were also posted on various bulletin boards. A majority of people, however, reached the website of the survey through search engines by using keywords: stuttering and/or bilingual. This resulted in a high proportion of bilingual speakers (82.6%) and also a high proportion of people who reported to have experienced stuttering (21.7%) at some point in their lives. The modal language used by respondents to the survey is English. Therefore, respondents are either monolingual English speakers or speakers who have English as their second language.

### *Questions*

Personal information, e.g. gender, date of birth, ethnic background, occupational background, educational level etc. were extracted from each respondent. Information on various aspects of language usage was also collected, for example, the age of onset and self-reported proficiency level of L1 and L2 (if applicable). The proportion of language usage in L1 and L2 and the environment under which they were used are also recorded. Details of parental language usage were also asked for. Finally, any language disorder and details of it and family

history of language disorder were also recorded. Not all information extracted from the questionnaire is reported in this current paper.

### Respondents

The 794 responses were received from 40 countries around the world and the respondents have 52 different mother tongues (L1). They also have over 70 different second languages (L2). The age of the respondents when they filled in the questionnaire ranged from 3-80 (mean 26, *SD* = 11). There were 461 female (58.06%) and 333 male (41.94%) respondents. The number of bilinguals totaled 656 (82.62%). 172 out of all respondents reported history of stuttering (21.66%).

## RESULTS

In the analysis, second language (L2) speakers include multilingual speakers and L2 is taken to mean languages acquired besides the mother tongue (L1). The stuttering population is defined as those who reported a history of stuttering (self-reported) which may not be diagnosed by a clinician and the stutterer may not, at the time of filling in the questionnaire, still exist.

There are significantly higher percentage of speakers experienced stuttering in the male respondents (30.03%) than for the female respondents (15.62%),  $\chi^2 = 23.664$ , *df* = 1, *p* < .001. There are, however, almost identical level of respondents in both the monolingual (21.74%) and the bilingual population (21.65%),  $\chi^2 = 0.001$ , *df* = 1, *NS*. The two populations are further divided into male and female. There is no significant difference in frequency of stutterers between bilingual and monolingual speakers for either the male or female population. 15.65% in the female bilingual population and 15.48% for female monolingual population. 29.75% in the male bilingual population and 31.48% in the male monolingual population.

The age of onset of L2 is used to classify the respondents into three groups: early bilingual (0-6 years), middle (7-12 years) and late bilingual (>12 years). A chi-square test shows that middle bilinguals experience significantly less stuttering than early or late bilinguals,  $\chi^2 = 8.322$ , *df* = 2, *p* < .05. The three groups of bilingual were divided into male and female again. The trend is found in the female population,  $\chi^2 = 6.235$ , *df* = 2, *p* < .05. Middle bilinguals are less likely to experience stuttering than the early or late bilinguals. No significant result, on the other hand, is found in the male population. The mean percentage of bilinguals experienced stuttering is graphed out in Figure 1. Next, the proportion of monolingual speakers reported to have stuttering experience (21.74%) was used as baseline for comparison with the early (23.48%), middle (16.13%) and late bilinguals (27.81%). No significant difference emerged. The proportions of monolingual speakers and early, middle and late bilinguals were divided and compared by gender. No significant result was found for either gender. The proportions of monolingual speakers experienced stuttering for both genders are also shown in Figure 1.

The early bilinguals were divided into seven finer subgroups depending on their reported age of L2 onset (0-6) to test if there is a particular age where learning a second language might interfere with language development in general. Comparison of proportion of respondents experienced stuttering at the seven age groups were compared with the baseline (those of monolingual speakers). Only the age groups comprised with more than 10 respondents are included in comparison (this excludes subjects in age 1). Only 3 years is found to be

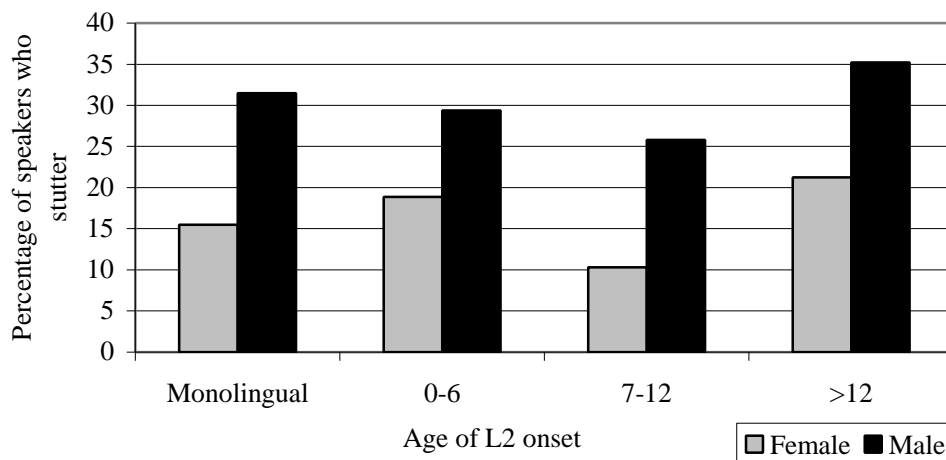


Figure 1. Age of L2 onset and percent of speakers who stutter

significant at 44.44%,  $\chi^2 = 6.1352$ ,  $df = 1$ ,  $p < .025$ . Once again, all age groups and baselines were divided into male and female. Only the results from the female respondents showed significant differences at age 3, 43.75%,  $\chi^2 = 6.7150$ ,  $df = 1$ ,  $p < .01$ . The mean proportions of respondents who had experienced stuttering are shown in Figure 2 for different age of L2 onset. Means for female are represented in dots while means for male are in squares (less than 10 subjects in age 1, 2 and 6 for male and age 1 for female). The baselines for male and female are represented as the horizontal thinner lines, darker and lower one for females and fainter higher one for males.

Not all of the respondents who reported a history of stuttering were able to trace their onset of stuttering. A majority of late bilinguals who stutter acquired their L2 after their stuttering onset (64.29%) compared with 14.29% who acquired stuttering after L2 onset. For middle bilinguals, the figures were 62.50% (stuttering earlier than L2) and 17.50% (stuttering onset after L2 onset). For early bilinguals, the proportions are 5.17% and 62.07% respectively. This is not surprising given that the average age of stuttering onset is at 6.97 years ( $SD=5.28$ ) for 145 respondents who reported their age of stuttering onset. The proportions of respondents whose age of L2 and stuttering onset fell in the same year are as follow: early bilinguals (12.07%), middle bilinguals (10.0%) and late bilinguals (0%).

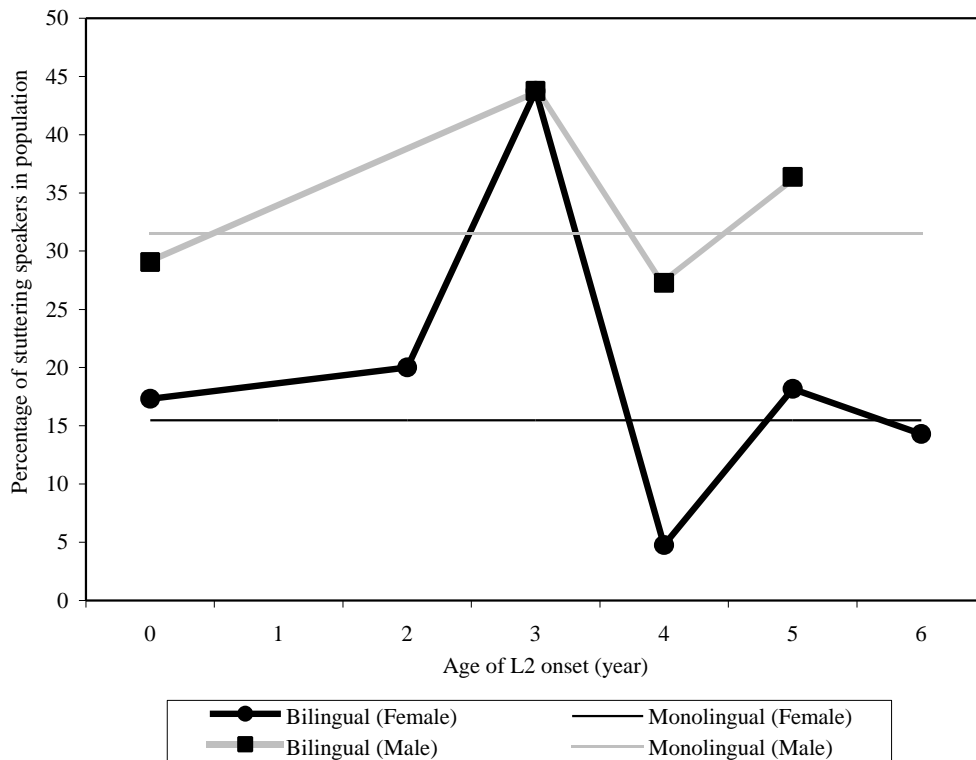


Figure 2. Male/Female monolingual vs bilingual (different L2 onset)

## DISCUSSION

The data reported in this study is from a small scale pilot study and a full scale study with a more random population is in progress. The number of respondents is only a fraction of those of Travis et al's (1937) study. The number of monolingual speakers was only 6% of those of the Travis study and 27% of their bilingual population. The stuttering population from the Travis study seems to include those who have the speech problem when the survey was carried out while our survey included those who reported to have the problem past or present. The social, cultural and linguistic background of the bilingual speakers in our survey are massively different from those from the Travis study. In our survey, there are a number of true bilinguals who started learning L2 at the same time as their L1 while the migrant children from the Travis study would not include such population. Our bilingual population is typically from second or third generation migrant families who no longer belong to the hard up migrant working class (they have access to computers either at their place of study/work or home). A number of bilinguals learned a second language as a subject in school. A large number of those are children from well to do families where a second language is seen to be a useful tool in the evergrowing business world.

The current study showed that there is no difference between monolingual and bilingual speakers in term of their likelihood of having stuttering in their life. In particular, learning both L1 and L2 at the same time (at age 0) do not seem to pose a problem (Figure 2). Our result, however, showed that acquiring L2 at around age 3 might result in a higher chance in experiencing stuttering. This would fit into a theory of a critical period in language development (c.f. Scovel, 1988) which may reflect development of learning process rather than innate mechanisms (Elman et al., 1996). This may indicate that learning a second language while L1 is not fully developed may interfere with language development (c.f. <http://www.kidsource.com/ASHA/bilingual.html>). Recent research by Gershkoff-Stowe and Smith (1997) showed that speech error was linked to the rate of vocabulary growth which is rapid round about this age. At age 0, on the other hand, children do not start learning to produce vocabulary as such but rather are still in a babbling. The reported differences at age 3 happened only to the female population but not to the male population (Figure 2). This contradicts the general trend that boys are more likely to experience stuttering in life than girls. The underlying reason could be that girls are more advanced than boys in acquiring languages (including vocabulary) at this young age and learning L2 enhances difficulty disproportionately at this age (Gershkoff-Stowe & Smith, 1997). The age and gender differences relate well with the theory of different brain structure involvement depending on the age of L2 onset (Perani et al., 1998).

#### ABSTRACT

The UCL survey extracts information on L2 acquisition to establish if there is a causal relationship between bilingualism and stuttering. We hope to paint a picture of how bilingualism is linked to stuttering and if and when the introduction of a second language might interfere with the development of the first (L1) or second language (L2). Contrary to a previous study, bilingual speakers were not found to be more at risk of stuttering than monolingual speakers. To this end, a much larger sample is needed and a large scale survey is in progress which involves surveying children from many schools.

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