Relationship between stuttering severity in children and their mothers’ speaking rate

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INTRODUCTION

Stuttering is described as a disorder of fluency and is characterized by part-word, whole-word and phrase repetitions, interjections, pauses and prolongations.1 Perhaps no speech problem has received more attention than stuttering. A wide variety of theories have been proposed based on the enormous volume of research findings. Some theories have proposed physiological factors for the onset of stuttering, such as bilateral hemispheric dominance,2 right hemispheric dominance for speech,3 brain damage,4 neuropsychological or neuromuscular dysfunction,5 laryngeal dysfunction6 and central auditory dysfunction.7 Data on the frequency of stuttering among relatives of those who stutter have led some investigators to propose a genetic component to stuttering.8-11 Others have suggested environmental factors for both the onset and the maintenance of stuttering, such as communicative stress,12 anxiety,13 personality and negative parent-child interactions.14-16

Although the recent advances in imaging techniques have shifted attention to neurological and/or physiological factors for the onset or cause of stuttering,15,16 the communication environment that stutterers live in may contribute towards maintaining the stuttering. Moreover, this communication environment that stuttering children live in may even play an important role in the success or failure of speech therapy. In other words, the role of the environment and, in particular, the linguistic and paralinguistic behavior and attitudes of parents have frequently been cited in both theoretical and clinical literature as presenting important correlations with the onset and development of stuttering among young children.17-21

Clinical intervention strategies currently used for children who stutter also frequently focus on the parents’ role, instructing them to alter their linguistic behavior (e.g. by reducing negative statements regarding their child’s speech and/or stuttering) and their paralinguistic behavior (e.g. by reducing their overall speech rate).22-29 For example, Guitar and Marchinkoski30 and others31 reported that reductions in mothers’ speaking rates resulted in similar reductions in children’s speaking rates and corresponding improvements in speech fluency for some children who stuttered.

Past studies have observed parents from a unidirectional perspective. Research questions have centered on the idea that the parents of stutters were different from the parents of nonstutters. To conduct bidirectional research, Meyers and Freeman24,26 explored the notion that the parents of children who stutter are “habitually fast talkers” and reported that the mothers of children who stutter spoke significantly faster than the mothers of nonstutterers did. Based on samples of the 15 longest perceptibly fluent utterances produced by each child, Meyers and Freeman26 also found that the stuttering children spoke significantly more slowly during their fluent speech than did their nonstuttering peers, and that the children with severe stuttering talked more slowly than did the children with moderately severe stuttering.

It has been hypothesized that alterations in parental speaking rates may influence the speaking rates of children who stutter.32-36 Guitar and Marchinkoski37 investigated the effects on children’s speech rate when their mothers talked more slowly and reported that when mothers substantially decreased their speech rates in a controlled situation, their children also decreased their speech rates.38

OBJECTIVE

The aim of this study was to correlate the stuttering severity index with speaking rates of mothers and children.

METHODS: 35 pairs of mothers and their children who stuttered were studied. There were 29 boys and six girls, of mean age 8.5 years (range: 5.1-12.0). Speech samples from the mother-child pairs were audiotaped for approximately 15 minutes, until a reciprocal verbal interaction had been obtained. This sample was then analyzed in accordance with a stuttering severity index test and speaking rate parameters.

RESULTS: The research results outlined a significant relationship between the mothers’ speaking rate and their children’s stuttering severity.

CONCLUSION: The results suggest that the mothers’ speaking rate should be incorporated in the assessment and treatment of stuttering.

KEY WORDS: Speech. Language. Communication. Stuttering. Mother[s].
Table 1. Comparison between mothers’ speaking rates and children’s stuttering severity

<table>
<thead>
<tr>
<th>Severity index</th>
<th>Mean (SD)</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild (n = 12)</td>
<td>242.30 (2.96)</td>
<td>240.42</td>
<td>244.19</td>
<td></td>
</tr>
<tr>
<td>Moderate (n = 15)</td>
<td>252.08 (2.32)</td>
<td>250.80</td>
<td>253.37</td>
<td>&lt; 0.01*</td>
</tr>
<tr>
<td>Severe (n = 8)</td>
<td>264.18 (3.68)</td>
<td>261.10</td>
<td>267.26</td>
<td></td>
</tr>
</tbody>
</table>

*Statistically significant; CI = confidence interval; SD = Standard Deviation.

Figure 1. Severity index and syllables per minute among mothers.
children’s speaking rates and their stuttering severity. This showed a significant correlation (p < 0.01) such that increased stuttering severity was associated with decreased speaking rates among the children who stuttered. In other words, the children with severe stuttering severity had a slower speaking rate than the moderate group did, and the moderate group had a slower speaking rate than the mild group did.

**DISCUSSION**

Despite the behavioral complexity of a stuttering problem, dysfluency often plays a primary role in differential diagnostic decisions and treatment evaluations. It is known that absolute continuity of speech production is physiologically impossible. A perception of continuous speech can be obtained from the number of audible speech utterances and the shortness of the physiological pauses (e.g. intervals for swallowing and breathing), and from the linguistic pauses (e.g. memory effects and lexical access) that are pertinent and expected from any speaker. The present study regarded the mother’s speaking model as an important part of her child’s interaction environment, which had an impact on the child’s speaking model and was associated with the severity of the problem. This basic result held true in the present study, such that with increased speaking rates among the mothers with stuttering children, their children’s stuttering severity would also be increased.

As was noted in the present study, the mothers with high speaking rates imposed more time pressure and communication stress on their small conversation partners. Thus, their children felt under more stress, which would result in enhancement of their stuttering severity.

On the other hand, enhancement of the children’s stuttering severity would lead their mothers to get into a “nervous state” and they would compensate for this by increasing their speaking rates, in the hope that their children might increase their speaking rates.

Another result obtained from the present study was that, with increasing stuttering severity among these children, their speaking rate decreased. This result is also in line with the findings of Meyers and Freeman. Furthermore, the results from de Andrade et al. and from the present study have confirmed the findings previously published regarding speakers of American English, thereby pointing towards a direct relationship between increases in the stuttering severity index and reductions in speech rate.

The latter result, showing that there is an interesting negative correlation between mother’s and children’s speaking rates, is in line with the findings of Ainsworth and Fraser, Conture and Fraser, Costello and Meyers and Freeman. All of these other studies hypothesized that alterations in parental speaking rates influenced the speaking rates of stuttering children. Moreover, the present study was in line with Meyers and Freeman, in concluding that the more the child stuttered, the slower he talked, and the slower the child talked, the faster the mother interacting with him talked. However, it is equally possible to interpret this analysis as demonstrating that the faster a mother spoke, the more the child stuttered.

**Table 2. Comparison between speaking rates of mothers and children**

<table>
<thead>
<tr>
<th>Speaking rate</th>
<th>Pearson correlation</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>251.49</td>
<td>8.70</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td>-0.92</td>
</tr>
<tr>
<td><strong>Child</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>115.50</td>
<td>17.70</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p-statistically significant; SD = standard deviation.*

**Table 3. Comparison between children’s speaking rates and their stuttering severity**

<table>
<thead>
<tr>
<th>Children’s stuttering severity</th>
<th>Children’s speaking rates</th>
<th>95% CI</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild [n = 12]</td>
<td>134.45</td>
<td>5.07</td>
<td>131.22</td>
<td>137.67</td>
</tr>
<tr>
<td>Moderate [n = 15]</td>
<td>113.66</td>
<td>7.55</td>
<td>109.48</td>
<td>117.85</td>
</tr>
<tr>
<td>Severe [n = 8]</td>
<td>90.54</td>
<td>5.72</td>
<td>85.75</td>
<td>95.33</td>
</tr>
</tbody>
</table>

*p-statistically significant; CI = confidence interval; SD = standard deviation.*

**Figure 2. Severity index and syllables per minute among the children who stuttered.**
and the more he stuttered the slower he talked, and so forth.

There are several possible reasons why mothers might use a faster speaking rate when talking to a slow-talking or stuttering child. First, stuttering behavior may alter dialogue patterns. That is, a slow-speaking and/or stuttering child may disrupt the pace of the ongoing interaction, thus prompting the mother to speed her rate in the hope of increasing the child's rate. By talking faster, a mother may press the child to talk faster, and talking faster may lead to increased stuttering. Alternatively, a child's struggle for fluency, or his frequent dysfluency, may create internal discomfort, tension, anxiety or "nervousness" in his mother. Such internal reactions may alter a mother's speech motor behavior, thereby causing her to speak faster.40

CONCLUSION

The findings from the present study suggest that the speech rates of mothers and their children who stutter are important indicators of fluency levels among stuttering children and should be incorporated in the assessment and treatment of stuttering. Mothers, as their children's main communication partners, have an important role in the therapy process and in setting clinical strategies.

REFERENCES

RESUMO

Relação entre a gravidade da gagueira em crianças e a taxa de fala em suas mães

CONTEXTO E OBJETIVO: Gagueira é uma doença complexa que tem influência nas realizações ocupacionais, sociais, acadêmicas e emocionais. A finalidade deste trabalho foi correlacionar o índice de gravidade da gagueira de crianças com as taxas de velocidade da fala de suas mães.

TIPO DE ESTUDO E LOCAL: Estudo transversal, realizado na clínica infantil de reabilitação da cidade de Teerã.

MÉTODOS: Uma amostra da fala de 35 crianças gagas pareadas com suas mães, sendo 29 meninos e 6 meninas, de 5:1-12:0 anos (idade média de 8.5), foi gravada por aproximadamente 15 minutos para avaliar a interação verbal recíproca, sendo então analisada de acordo com o índice de gravidade da gagueira e com os parâmetros de taxa de velocidade da fala.

RESULTADOS: Os resultados da pesquisa mostraram uma relação significante entre a taxa de velocidade de fala da mãe e a gravidade da gagueira da criança.

CONCLUSÃO: Os resultados sugerem que a taxa de velocidade da fala entre a mãe e a criança que gagueja deveria ser incorporada na avaliação e tratamento da gagueira.