

# STUTTERING: ITS CAUSE AND TREATMENT

WENDELL JOHNSON, PH. D.

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BY

WENDELL JOHNSON, PH. D.

State University of Iowa Speech Clinic

The author of this article was himself a stutterer  
and is now a speech clinician

## Stuttering: Its Cause and Treatment

**I**F your child stutters, you will be interested in the fact that during the past few years scientific inquiry into the causes, nature and treatment of stuttering has changed radically our understanding of this age-old affliction.

We know now that stuttering is not a habit, not merely a kind of "nervousness," not merely a symptom of mental and emotional upset, of fear or timidity. We know that it is not caused by poorly formed speech organs. We doubt that imitation alone can produce real stuttering. We understand now that stuttering itself is not inherited, but that an organic predisposition for the disorder may be inherited. Proper training, however, can prevent the predisposition from developing into stuttering. And faulty training, among other factors, can produce stuttering in a child not possessed of any important hereditary predisposition for it.

We recognize that, aside from their speech disorder, stutterers are essentially normal, comparing favorably with the rest of the population. If they show any other abnormalities, they are likely to reveal a lack of average ability in silent reading and perhaps in spelling. They may exhibit somewhat more than average degrees of shyness, anxiety, and feelings of discouragement or depression. These personality traits we recognize as being chiefly the results rather than the causes of stuttering. That is, we realize now that whenever stutterers are shy, worried, or depressed, they are so largely because of the handicap and humiliation of stuttering.

It is quite well established that the average intelligence

of stutterers is essentially on the same level as the average intelligence of normal speakers. In fact, among university students, stutterers' average considerably higher than non-stutterers in intelligence.

We know that the stutterer is not likely to outgrow his affliction if no special effort is made to cure it. The proportion of stutterers among persons of college age is practically as high as the proportion of stutterers among elementary school children. If any significant number of stutterers "outgrow it," they must do it before entering the first grade in school.

It used to be supposed that stutterers were rare, and this opinion is still prevalent. But we are certain that approximately one per cent of the population stutters. This means that there are about one million stutterers in the United States, about ten times more than the number of blind persons and deaf-mutes combined. Around eighty-five per cent of these began to stutter before the age of *eight*.

It is a fairly popular belief that stuttering is not a serious defect. But we know that more than one out of four stutterers admits the serious contemplation of suicide—as compared to one out of seven among normal speakers. At the eighth grade level, stutterers are retarded on the average about one year in school, in spite of normal mental ability. That is, stuttering handicaps them to that extent. We know that stutterers reveal a strong tendency to enter vocations requiring little or no speech. The result is serious economic loss to themselves and to society, for many of them never get into the kinds of work for which they are suited. For most stutterers their affliction is a serious social handicap and a source of considerable embarrassment and sorrow.

After ten years of intensive scientific investigation, we know that the following methods of treatment are *not* satisfactory: word drills, swinging the arm while talk-

ing, speaking under relaxation, talking slow or fast, slurring the consonants and emphasizing the vowels, talking with the upper and lower teeth together, talking with a pebble under the tongue, breathing exercises, "keeping calm," "stopping and starting over," "using will power" in an effort to force the words out without stuttering, "forgetting about it."

A word of explanation is necessary here. You will observe that the above methods of treatment are directed almost entirely at the symptoms of stuttering. Any such method is superficial. To the extent that it reduces the symptoms, it gives some relief. But unless it aims at the root of the trouble and changes the underlying conditions, it cannot bring about a permanent and complete cure. The methods mentioned above are not designed to go directly to the root of the trouble, and their indirect effect on the fundamental causes of stuttering is only in rare cases sufficient to give a cure.

So much for brief mention of some general facts. Let us see what science has discovered in a positive way about the causes, nature and treatment of stuttering. It will be necessary to have a look at the underlying mechanisms of normal speech, if we are to understand abnormal speech. The discussion that follows is based upon what we now know about neurology, and upon the intensive scientific studies of stuttering, carried out chiefly by Dr. Lee Edward Travis in his laboratories at the State University of Iowa.

If you were to go into the dissecting room of a medical college, you would be able to observe at first hand the organs used for speech. Your first discovery would be that the working parts of these organs are muscles. You would be impressed by the fact that there are many hundreds of these muscles, and that for normal speech these hundreds of muscles, some of them far removed from some of the others, must move all together, with the finest

precision, while we utter perhaps two hundred words a minute. You may pause to ask why there are only one million stutterers in the United States!

Now, if you take the tongue and cut it in two from side to side, you will see that each half is actually a muscle. That is, the tongue is a single organ, made up of two separate muscles which must work together like one muscle. Carrying your study further, you will find that the entire speech mechanism is made up of paired muscles. Yet, each pair must move as one muscle—and all of the hundreds of pairs must move together.

Your wonder will increase when you find out that actually you have no speech organs! The lips, tongue and jaws serve primarily in the chewing of food. The muscles of the throat are used primarily for swallowing. The passages of mouth, nose, pharynx and larynx are for the function of respiration, as are the lungs, diaphragm, and muscles of the thorax. The larynx, or voice box, is designed by nature to prevent foreign objects from getting into the lungs, and for regulating the passage of air in and out of the lungs. Every organ and muscle used in speaking is meant by nature to perform some vital function far more important than speech.

But we do have speech, and by continuing your investigation you will discover why we do. You will see that from each muscle there run little whitish-gray threads. These are nerve fibers. Following along one of these, you will find that it soon joins with other nerve fibers to make up large nerve trunks. You will be able to trace these into the spinal cord and brain. That is, some enter the cord and pass up the cord to the brain, and others enter the brain without passing through the spinal cord.

If you are thorough in your observations, you will see that about half of these nerve trunks end in the right side of the brain, and that the other half end in the left side of the brain. Looking at the brain, you will see that it

is shaped roughly like one half of an egg cut lengthwise. It is divided into two halves which appear to be alike, except that they face each other.

Now, if you put your finger on a nerve tract in the left half of the brain you will be able to run your finger along this tract, and when you reach the place where the spinal cord enters the brain, your finger will follow the nerve across to the right side and down the right side of the cord. Then you will follow it out from the right side of the spinal cord and into a muscle on the right side of the body. Carrying on your study, you will see that muscles on the right side of the body receive their nerve supply from the left half of the brain, and that muscles on the left side of the body receive their nerve supply from the right side of the brain.

So the plot thickens. We discover that this simple looking tongue of ours is made up of two muscles which receive separate nerve supplies from separate parts of the brain. And not only the tongue. Every organ used for speech, being made up of paired muscles, is designed on the same plan.

Speech is a matter of muscle action. That is, speech occurs when the outgoing breath stream is acted upon by the vocal bands (controlled by muscles) and by the muscles which regulate the size and shape of the mouth and throat, so that air, escaping from the lungs, is converted into particular kinds of sound.

Muscle action, however, cannot occur without nervous currents entering the muscles, causing them to move in particular ways. These nervous currents come from the brain, traveling down the nerve trunks.

Now, let us take the tongue as being typical of all the organs of speech. In order for speech to occur in a normal fashion, two separate nervous impulses, arising in the two separate halves of the brain, must travel down two separate nerve trunks, and arrive in the two separate

muscles of the tongue at exactly the same time! There must be a streaming series of these nervous currents, at a rate of several hundred per second, the currents in the two separate nerves being exactly alike as to rate, rhythm and intensity of strength, in order that the two halves of the tongue may move together in precise harmony.

What is true of the tongue is true of the muscles regulating the vocal cords, the lungs, and the other organs used for speech. The two sides of the entire mechanism must receive from separate parts of the brain identical patterns of nervous currents. How can this possibly occur?

Your first guess would probably be that it occurs because the two halves of the brain are exactly alike. But mathematicians tell us that, because the nervous system is so complex, the chances are overwhelmingly great that this guess of yours is utterly wrong. Rather, the delicate harmony which we have been discussing occurs *because the two halves of the brain are not equal*. One half is stronger, more active than the other half.

The more active, stronger half sends out nervous impulses at a certain rate and with a certain rhythm. Being the stronger dominating half, it imposes its pattern of activity upon the other, weaker half, which consequently sends out nervous impulses at the same rate and with the same rhythm.

As a result, muscles on the right side of the body move with the same rate and rhythm as do muscles on the left side, and so normal fluent speech occurs.

We can make this clear by comparing the two sides of the brain to two orchestras in adjoining rooms. If one is a large orchestra and the other a small one, the small one will find it hard to play any other tune except the one being played by the large orchestra. It will have an easy time playing the same tune that the large orchestra



is playing. So it is with the two halves of the brain, when one half is stronger and more active than the other.

But suppose our two orchestras are of the same size. Then each can play its own tune quite easily. This essentially is what happens when one half of the brain is as active and as strong as the other half. Each half then sends out nervous currents at its own rate and rhythm. The muscles on the right side of the body are activated differently from those on the left side. The tongue, for example, receives two different and conflicting impulses. The result is a muscular spasm. This, then, is stuttering.

So we understand that if we are to have normal speech we must have normal brains, that is brains capable of producing normal speech. And if we do not have such brains, any form of treatment which will not fundamentally change our brains is not going to be of substantial benefit to us. That is why most of the treatment which used to be offered to stutterers—and which still is in many places—was of no great value.

Why are the brains of stutterers different from those of normal speakers? What causes stuttering?

Anything which acts to make the two halves of the brain equal or nearly equal in strength and development, tends to cause stuttering. Heredity plays a rôle here. Some children are so constructed by nature that as they grow and develop, neither half of the brain becomes sufficiently stronger than the other half to dominate it. The result is likely to be stuttering and slow speech development.

Birth injuries, diseases of the nervous system, high fevers, prolonged ill health, prolonged emotional upset or severe emotional shock are sometimes serious enough to cause a change in brain condition resulting in stuttering. The stronger, more active half of the brain is more sensitive to all conditions, whether good or bad. Stuttering tends to occur when it is weakened to the extent that

it can no longer impose its rate and rhythm of activity upon the other half of the brain.

We have found that the most common cause of brain changes leading to stuttering is the shifting of left-handed children to the use of the right hand. We do not mean to say that left-handedness causes stuttering. It is the change from left- to right-handedness that is important. In a very few cases we have found that a change from right- to left-handedness, usually because of injury, has had the same effect. We may explain briefly why this is true.

As stated above, muscles on the left side of the body receive their nerve supply from the right side of the brain, and vice versa. It is easy to see, therefore, that a child in whom the right half of the brain is the more highly developed will tend to have a superior left hand. If, then, he is taught to be right-handed—and to avoid use of the left hand—he will draw upon the activity of the weaker, left side of his brain. The stronger, right side of the brain, due to relative disuse, will not develop as it otherwise would. Meanwhile, the left side of the brain, due to greater use and stimulation, will develop faster and more than it otherwise would. If and when the two sides of the brain become relatively equal in development, the underlying condition for stuttering comes into being.

After this point is reached, three different things can happen. First, the equality of the two sides of the brain may persist, to the extent that stuttering will remain. This is what happens in the stutterer. Here is the typical case which comes to the clinic.

Second, continued use of the right hand may, in time, lead to sufficiently superior development in the left half of the brain to reestablish normal speech. Here is the stutterer who "grows out of it." And this is the explanation in many cases in which some kind of superficial

treatment appears to yield results. If this result has not occurred—if the stutterer has not outgrown his disorder—by sixteen or seventeen years of age, the chances are that he will not outgrow it. In fact, few stutterers “out-grow” the disorder after they are past seven or eight years of age. In many cases, especially among very young children, we treat the stuttering by making the change to right-handedness, already started, more thorough. This will sometimes establish dominance in the left side of the brain to the extent that normal speech results.

Third, it may be that continued use of the right hand cannot establish dominance in the left half of the brain. Then, a thorough-going shift back to left-handedness will usually reestablish dominance in the right half of the brain, which was originally superior. This state of affairs is the rule especially with older stutterers who were left-handed children, taught to be right-handed.

Many children who have been taught to be right-handed before they have had a chance to show their natural left-handedness stutter almost as soon as they begin to speak. But in any case in which handedness is changed stuttering may not appear until several years after the change has been started, when the two halves of the brain have become relatively equal.

We must not leave the impression that the treatment of stuttering consists only in developing definite handedness. Stutterers should be given the advantages of good physical hygiene, which is beneficial to anyone whether he stutters or not, and of proper mental hygiene, which also is beneficial to anyone. An effort should be made to help the stutterer face his situation squarely and with a good sense of values. These things should be done because, as was stated above, the dominant half of the brain is the more sensitive to all conditions, good or bad; and whatever affects the brain affects speech. Conse-

quently a thorough-going attempt should be made to affect the stutterer's brain with favorable body conditions.

While many parents may get from this discussion some clues as to how to treat stuttering in their own children, our urgent advice is that no treatment be undertaken without a thorough examination by a competent speech pathologist. It is so easy to do more harm than good. What the parent should understand is that it is now possible to prevent and cure stuttering.

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