

March 16, 2003

The Stuttering Doctor's 'Monster Study'

By GRETCHEN REYNOLDS

Wendell Johnson was a tall, knobby 20-year-old farm boy when he arrived at the University of Iowa in Iowa City to study English in 1926. The class president and valedictorian of his tiny high school in Roxbury, Kan., Johnson was engaging, "quite a clown" in the estimation of the folks back home. He also stuttered grotesquely, often rendered speechless by the impediment. His inability to express himself nudged him toward writing and literature, and he developed a penchant for antic humor, which kept him popular despite his silence. It also propelled him to U. Iowa, the most famous center for stuttering research in the world. Around the country, speech pathology was fighting to be recognized as a science, and Iowa was the new discipline's polestar. Dozens of experiments were under way when Johnson arrived, and he enthusiastically threw himself into the invigorating work, switching to psychology for his master's study. "I became a speech pathologist because I needed one," he'd later say.

Many of his fellow graduate students stuttered almost as painfully as he did, and they'd use one another as guinea pigs. They'd draw blood, hook themselves to electrodes, strike their knees to test reflexes, whip out notebooks in midstride and transcribe their own and others' faltering speech. They'd administer electroshock and shoot guns off near each other's ears to see if being startled affected stuttering. (It didn't, although the same experiment performed on normal speakers did affect their speech.) They'd also put casts on one another's arms, since it was hoped that immobilizing a person's dominant hand somehow would untangle confused brain signals. At one point, about 30 stutterers, including Johnson, wandered the Iowa campus with their arms wrapped in plaster, sometimes playing wrong-handed badminton. "We knew that we were working on something central in the life of a human being," one of Johnson's contemporaries told an Iowa historian. "We weren't just puttering around on the fringes."

At the time, physiology had become the favored explanation at Iowa for stuttering. The department's lead professors were certain that the disorder originated in misdirected brain signals. They had used a new device called an electromyograph to study neuromuscular activity in stutterers, nonstutterers and, in one experiment, people who were drunk (students who, solely in the interests of science, had become soused; the researchers skirted Prohibition by requisitioning alcohol from the university hospital.) The readouts from the booze-tinged subjects showed, to no one's surprise, impairment. Intriguingly, more comprehensive experiments showed that stutterers had subtle neuromuscular responses different from those of their nonstuttering peers.

But Johnson, by 1937 an ambitious assistant professor, wasn't convinced. His life story suggested otherwise. He'd spoken fine until he was 5 or 6, when a teacher mentioned to his parents that he was starting to stutter. Gradually an obsession with his speech took hold. His voice grew hesitant. He self-consciously repeated sounds. Those, of course, are among the hallmarks of stammering. By worrying about the problem, he decided, he'd produced it. His disorder lay not in his brain, in biology, but in his learned behavior. Stuttering, he later concluded, "begins not in the child's mouth but in the parent's ear."

This idea was provocative and powerful, with enormous implications for speech therapy. If stuttering is learned behavior, it can be unlearned. Biography, however, isn't proof. Johnson, to validate his thesis, needed to design an experiment that induced stuttering. If, he reasoned, any and every child could be made to stutter, then obviously no underlying physiological defect was required. If stuttering could be called forth in normal youngsters, it would be proved as a learned, conditioned response.

In the fall of 1938, Wendell Johnson recruited one of his clinical psychology graduate students, 22-year-old Mary Tudor, who was avid but timorous, to undertake exactly that experiment. She was to study whether telling nonstuttering children that they stuttered would make it so. Could she talk children into a speech defect? The university had an ongoing research relationship with an orphanage in Davenport, Iowa, so Johnson suggested she base her study there. And thus, on Jan. 17, 1939, Mary Tudor drove along the high, swooping bluffs overlooking the Mississippi River to the Soldiers and Sailors Orphans' Home. She toted notepads, chalkboards, a Smedley dynamometer (to measure hand strength) and a cumbersome Dictaphone.

The study she began that morning is now the subject of a multimillion-dollar lawsuit against the State of Iowa and the University of Iowa. Despite its 64-year-old provenance, it has occasioned a spate of recent articles in newspapers and speech-sciences journals and a full-day symposium at the Graduate Center of the City University of New York in December. Something happened at the orphanage in Davenport that seems to have been unintended by Johnson and unmeasurable by his science. Only now, at a remove of decades, can we begin to digest and appreciate what the Tudor study tells us about the origins of speech defects, as well as the ethics of science, the brittleness of children and the egos of driven men.

The Iowa soldiers and Sailors Orphans' Home was founded as a refuge for the offspring of men killed in the Civil War. By 1939, at the height of the Great Depression, it housed more than 600 orphans and demi-orphans (those whose destitute parents, although alive, couldn't care for them) in clusters of small cottages. Not as harsh as the nearby Industrial School for Boys in Eldora, Iowa, or as forlorn as the Institute for Feeble-Minded Children at Glenwood, it was nevertheless spare, joyless and regimented. Children rose at 5:30 a.m., had breakfast and cleaned until school began. They marched in long, careful lines, to facilitate order.

Mary Tudor's research at the Iowa Home began with the selection of 22 subjects. None were told the intent of her research. They believed that they were to receive speech therapy. Her experimental design was complicated. She was not only trying to induce stammering in healthy children; she was also trying to see whether telling stutterers that their speech was fine would produce a change. Included among the 22 subjects were 10 orphans whom teachers and matrons had marked as stutterers before the study began. Tudor and five other graduate students who agreed to serve as judges listened to each of the children speak, graded them on a scale from 1 (poor) to 5 (fluent) and concurred with the school's assessment. "Unwilling to talk but certain definite 'stuttering' phenomena," a researcher wrote of one boy, "tension, prolongations, explosiveness, repetitions. A stutterer." The 10 stuttering children were divided into two groups. Five were assigned to Group IA, the experimental set. They would be told: "You do not stutter. Your speech is fine." The five in Group IB would serve as controls and be told, "Yes, your speech is as bad as people say."

The remaining 12 children were chosen at random from the population of normally fluent orphans. Six of these were assigned to IIA, the group that eventually would lead to the lawsuit and contention. These children, ranging in age from 5 to 15, were to be told that their speech was not normal at all, that they were beginning to stutter and that they must correct this immediately. The final six children in Group IIB, similar in age to those in IIA, were normal speakers who were to be treated as such and given compliments on their nice enunciation.

On that first January visit, Tudor tested each child's I.Q. and handedness. A vogue theory then held that stuttering was caused by a cerebral imbalance. If, for example, you were born left-handed but were using your right hand, your nerve impulses would misfire, affecting your speech. Johnson felt the notion was nonsense, but he was thorough and suggested Tudor discern each child's handedness. She had them draw on chalkboards and squeeze the bulb of the dynamometer. Most were right-handed, but a sprinkling of lefties ran through all the groups. There was no correlation between handedness and speech in this subject crop. That was an auspicious start.

The experimental period lasted from January until late May 1939, and the actual intervention consisted of Tudor driving to Davenport from Iowa City every few weeks and talking with each child for about 45 minutes. She followed an agreed-upon script. In her dissertation, she reported that she talked to the stuttering youngsters who were going to be told that they did not stutter. She said to them, in part, "You'll outgrow [the stuttering], and you will be able to speak even much better than you are speaking now. . . . Pay no attention to what others say about your speaking ability for undoubtedly they do not realize that this is only a phase."

To the nonstuttering youngsters in IIA, who were to be branded stutterers, she said: "The staff has come to the conclusion that you have a great deal of trouble with your speech. . . . You have many of the symptoms of a child who is beginning to stutter. You must try to stop yourself immediately. Use your will power. . . . Do anything to keep from stuttering. . . . Don't ever speak unless you can do it right. You see how [the name of a child in the institution who stuttered severely] stutters, don't you? Well, he undoubtedly started this very same way."

From the first, the children in IIA responded. After her second session with 5-year-old Norma Jean Pugh, Tudor wrote, "It was very difficult to get her to speak, although she spoke very freely the month before." Another in the group, 9-year-old Betty Romp, "practically refuses to talk," a researcher wrote in his final evaluation. "Held hand or arm over eyes most of the time." Hazel Potter, 15, the oldest in her group, became "much more conscious of herself, and she talked less," Tudor noted. Potter also began to interject and to snap her fingers in frustration. She was asked why she said 'a' so much. "'Because I'm afraid I can't say the next word.' Why did you snap your fingers? 'Because I was afraid I was going to say 'a.''"

All of the children's schoolwork fell off. One of the boys began refusing to recite in class. The other, 11-year-old Clarence Fifer, a chubby, diffident child, started anxiously correcting himself. "He stopped and told me he was going to have trouble on words before he said them," Tudor reported. She asked him how he knew. He said that the sound "'wouldn't come out. Feels like it's stuck in there.'"

The sixth orphan, Mary Korlaske, a 12-year-old, grew withdrawn and fractious. During their sessions, Tudor asked whether her best friend knew about her "stuttering," Korlaske muttered, "No." "Why not?" Korlaske shuffled her feet. "I hardly ever talk to her." Two years later, she ran away from the orphanage and eventually ended up at the rougher Industrial School for Girls. "I couldn't never tell my husband about it," Korlaske, now Mary Nixon, said in a brief telephone conversation in January. "It just ruined my life." Her voice broke. "I can't talk no more," she said, and with an audible oath, she hung up.

Mary Tudor herself wasn't untouched. Three times after her experiment had officially ended she returned to the orphanage to voluntarily provide follow-up care. She told the IIA children that they didn't stutter after all. The impact, however well meaning, was questionable. she wrote to Johnson about the orphans in a slightly defensive letter dated April 22, 1940, "I believe that in time they . . . will recover, but we certainly made a definite impression on them." The emphasis is hers.

When Wendell Johnson was a boy, he ran the rounds of contemporary stuttering therapies. His family doctor gave him sugar pills. A faith healer, thundering from a high stage, frightened and disappointed him. He went to a chiropractor. At 16, with his speech almost unintelligible, he begged to be allowed to attend a far-off stuttering "school." There, for three months, he recited aloud in a deliberately flat monotone and swung dumbbells while metronomically chanting, "Have more backbone and less wishbone." None of this cured him, and abruptly, he quit. "I went to the station, stuttered to the ticket agent and to the conductor and . . . closed my eyes in despair," he wrote in "Because I Stutter," his first book. "I was terribly ashamed. . . . I hated stuttering."

His affliction shaped and spurred the remainder of his life and career. "Like most stutterers, he was baffled by his stuttering," wrote Oliver Bloodstein, Ph.D., a professor emeritus of speech at Brooklyn College and Johnson's most distinguished pupil. "He spent hours trying to figure out what he was doing that made him stutter."

This lacerating curiosity drove him to undertake a series of ingenious experiments, before and after the Tudor study, into the essential nature of stammering itself. What is it? How does it work? To answer these questions, he began by giving stutterers a page bordered in red and having them read aloud in front of an audience, where their stuttering would become worse. Afterward, the subjects tended to stutter painfully anytime they read a page marked with red, even when reading to a single person. Next, he blacked out words over which a particular stuttering reader had stumbled. When the person reached the word next to the one crossed out, he'd stutter. He'd become accustomed to stumbling there and, even without the troublesome word, he still did. These results said to Johnson that stuttering was indisputably a conditioned, learned response.

He also proved that individual stutterers were consistent. They tended to stumble over the same sounds (although the sounds themselves varied from person to person) and grew to dread them, often substituting entire words. ("My f-f-fa . . . dad.") They'd also whisper. When they were about to reach troublesome fricatives, their eyes would bulge. They'd thump their knees, click their fingers, rasp desperately or shake their heads in a spasmodic attempt to force out the sound. Johnson defined those actions as the associated behaviors of stuttering and claimed that in adults they would diminish if the stutterer relaxed and didn't anticipate a speech block. He liked to point out that in certain situations even the most afflicted don't stutter, during, for instance, singing or in unpressured speech with infants or dogs. "One severe stutterer virtually lived the life of a nomad because he was able to communicate vocally only whenever he established himself in a new town," wrote Oliver Bloodstein, who did Johnson's fieldwork.

Johnson's findings about the nature of stuttering, once it has begun, remains the accepted wisdom to this day. The disorder does respond to conditioning, and once established, stuttering can have a ruinous momentum. Often, the worse someone stutters, the more he fears speaking, and the worse his speech becomes.

What Johnson's thinking did not explain is why severe stuttering starts. Episodes of speech disfluency are common among adults and children, especially the very young. But about 5 percent of all youngsters exhibit clinical stammering, according to Ehud Yairi, a professor of speech and hearing science at the University of Illinois. Of these, about 75 percent recover without treatment, but about 1 percent of all people (about three million Americans) continue to stutter noticeably into adulthood. It is those whom Johnson studied in his work on the progression of the disorder. Why, though, were those few stricken in the first place?

Johnson had no family history of stuttering and dismissed the possibility that the condition could be heritable. "Stuttering is learned behavior, Johnson said, and he repeated it again and again," Bloodstein

wrote in an e-mail message. "It virtually became his mantra." He had indirect, anecdotal data, too, that backed his contention. Beginning in 1934, he and his assistants questioned the mothers of dozens of young stutterers, asking when the disorder had begun and how the family had responded. He also tested age-matched "normal" speakers and found that they had many speech defects as well. Unfortunately for the "stutterers," Johnson said, their parents overreacted, made the children panic and produced full-blown stuttering. The diagnosis caused the condition. Johnson termed this the diagnosogenic theory, and it became the cornerstone for his writing and teaching, his growing fame and eventually the basis for his ideas about the treatment of stuttering children. It also, by its dictates, should have ensured that all the orphans in Mary Tudor's Group IIA would stutter soon after Tudor began telling them that they did.

But they did not. In fact, the most telling aspect of Mary Tudor's experiment is that it failed completely. Of the six normal children who were falsely labeled stutterers, two actually improved their speech fluency, according to the researchers' ratings, over the course of the five-month study -- one by almost a full point, from 3 to 3.8. Another's fluency rose from 3 to 3.6. For two others, their fluency ratings didn't budge. Of the two children whose fluency fell, one, Clarence Fifer, dropped from 2.6 to 2, the second, Hazel Potter, from 3.1 to 2.8.

The other primary study group fared little better. Of the actual stutterers who were told they now spoke fine, two showed slight improvements in fluency, two decreased in fluency and one was unchanged. The results for each of the groups were "not only insignificant, but also in the wrong (unexpected) direction," concluded Yairi and a colleague in an article in the May 2002 issue of *The American Journal of Speech-Language Pathology*.

The experiment did, however, have an impact. In each case, the nonstuttering children of Group IIA began to act like stutterers. "All of the children in this group showed overt behavioral changes," Mary Tudor wrote in her thesis, "that were in the direction of the types of inhibitive, sensitive, embarrassed reactions shown by many adult stutterers in reaction to their speech. There was a tendency for them to become less talkative." They also, during their sessions with her and in front of the researchers, shuffled their feet, whispered, snapped their fingers, gulped, gasped and clamped their mouths shut. They looked like stutterers. They spoke fine.

It seems highly unlikely that you can make a stutterer. You can induce the accompanying tics -- the shuffling and the self-consciousness. Those can be taught and reinforced. But clinical stuttering cannot. It exists or it doesn't. Johnson's theory was not upheld.

After Mary Tudor submitted her completed master's thesis in August 1939 with a dedication to Johnson, it sank straightaway into obscurity. Johnson did not oversee its publication, as he often did with his students' theses. He did not include it in his otherwise comprehensive indexes of University of Iowa stuttering research. Not until 2001 did it receive national press attention, in a series of articles in *The San Jose Mercury News*. However, the thesis, which was available at the university library, did have a ghost life among Iowa speech pathology students. "Those who had heard about it nicknamed it the 'Monster Study,'" remembers Franklin Silverman, a professor of speech pathology at Marquette University and a former student of Johnson's. "It reminded people of the Nazi experiments on human subjects. The other professors at the time told him that it would ruin his reputation to publish the data. It was chilling and disturbing, especially to think that Wendell Johnson, of all people, had sanctioned it. He knew the pain of being told that you stutter."

It is an ugly thing, after all, to experiment on orphans. And Johnson's admirers, who still are legion, struggle to understand why he proposed and designed the project. "I have to assume it was because he firmly believed that it would serve a greater good, that it would help thousands of other children who

stuttered and that any damage would be temporary and reversible," says D.C. Spriestersbach, vice president and dean emeritus of the University of Iowa and another of Johnson's students. "He was a wonderful, empathetic man, and he understood the torment of a speech defect. He wouldn't have been able to bear it if he thought he'd actually forced someone to stutter."

He pauses. "But he never talked about the Tudor study to me or anyone else that I'm aware of. So all I can do really is guess."

During the 1940's, when Johnson, despite his speech impairment, was one of the most popular lecturers on the Iowa campus, he used to exhort his students to question "the voice of authority." He'd say, "Whenever you hear a dogmatic, absolutist statement from any kind of 'expert,' ask, 'What do you mean and how do you know?'"

The Tudor study was not only morally troubling; its results must have been, for Johnson, confounding. The data threatened to undercut his belief, which was unswerving, that stuttering is purely behavioral. "It ran counter to what he stood for," says Gerald Zimmermann, a former speech professor at Iowa and now a literacy specialist. "I wouldn't want to publicize a blow like that either. But, hey, that's science."

Johnson sometimes referred to the study in lectures, claiming that it had caused an orphan, presumably Hazel Potter, to stutter and therefore validated his diagnosogenic ideas. But the researchers, in their final evaluation, graded her a nonstutterer.

Johnson did not mention the study again. In 1959, he published his famous "Onset of Stuttering," which laid out the diagnosogenic theory in detail. However, nowhere in its pages does he mention the orphan experiment. The Tudor study "should have been discussed," Zimmermann says. "It should have been part of the record and the canon. Maybe everyone would have supported the diagnosogenic theory anyway. Johnson was persuasive. But at least a question would have been raised."

From the 1950's until the early 1980's, Johnson's theory, unsullied by doubts, was the underpinning of most childhood speech intervention in America. Therapists, swayed by diagnosogenic theory, declined to work directly with young stutterers, fearing that the therapy could worsen the affliction. They'd instead counsel a child's parents, telling them to stop worrying so much. Sometimes this helped the child. Other times it didn't.

Today, one of the most widely accepted models for explaining persistent stuttering is that a genetic component provides a biological predisposition to stutter. Not everyone with "stuttering genes" progresses, of course, to a full-blown disorder. There are environmental cues that are necessary. One of these may be a panic-stricken parent. In a child with a sensitive temperament, a father or mother's reaction may push the child over the edge. In this way, Wendell Johnson's thesis partly survives. But as the sole predictor of stuttering, diagnosogenic theory has been thoroughly overthrown. "No one believes anymore that only your parents make you stutter," says Robert Goldfarb, head of the Ph.D. program in speech and hearing sciences at the CUNY Graduate Center and the organizer of the symposium there. "It's probably a shame for speech therapy and for parents that anyone ever did."

Nowadays, researchers think that the most helpful form of speech therapy is working directly with children. In face-to-face sessions with their therapists, children are encouraged to practice breath control, easing words out instead of forcing them and stretch out sounds to make them longer. One can't help wondering what would have happened had Johnson published the Tudor findings. Would the results have raised issues that might have led to an earlier shift in treatment for stuttering children? And would those young stutterers have been better served by this more direct intervention? We can't know. Though

researchers now have more success reducing disfluency in children, the discipline of speech therapy remains inexact and, for some stutterers, eternally ineffective. "We don't have any way of measuring the impact of having lost the Tudor study for all those years," Zimmermann says.

Perhaps Johnson felt the need to protect a doctrine that explained not only a crippling affliction but also the very arc of his life. Wendell Johnson "was outgoing," Oliver Bloodstein wrote. "He was comradely. But he was also hard at work for recognition in his field . . . like so many gifted people, he was burdened with an unshakable conviction that he was right."

The reverberations of the 64-year-old Tudor study will sound for years. The three surviving orphans from Group IIA, Norma Jean Pugh (now Kathryn Meacham), Mary Korlaske (now Mary Nixon) and Hazel Potter (now Hazel Dornbush), are each suing the State and University of Iowa for millions of dollars, citing among other things the infliction of emotional distress and fraudulent misrepresentation. The estates of the three deceased orphans will be part of the suit. "I think that a jury will agree that even if these people's speech wasn't exactly ruined, their lives were," says Evan Douthit, a Kansas City, Mo., attorney who is representing five of the claimants. "Kathryn Meacham has thought of herself as a freak all her life. She still hates to talk, except to her family and a few people in her church. She's a sad, sad lady."

Hazel Potter Dornbush is scrappy and decisive at 79. "Imagine trying to wreck a little child's voice," she says. "But I've moved on. I married a good man. I talk O.K. Even the orphanage wasn't that bad. There were always other children around, so it wasn't lonely." She pauses. "I don't really remember being that close to any," she adds, suddenly puzzled. "But back then, you know, I was quiet."

In 1965, at 59, Wendell Johnson sat at his desk still defending diagenetic theory. He was preparing an entry for the Encyclopaedia Britannica on "Speech Disorders" when he suffered a massive heart attack. The 4,000-word essay, completed and published posthumously, brooks no dissent. "The child learns speech-disruptive behavior as he tries to keep from stuttering and so to gain approval," he writes. Johnson's didacticism lessens near the end, however, and he grows almost gentle. "Persons with speech disorders . . . have traditionally known the scorn, ridicule and even revulsion of their society," he writes in the voice of a man driven all his life to make sense of the ability to speak.

Gretchen Reynolds is a writer who lives in Santa Fe.