Gierut / Learnability Project

The Learnability Project was founded in 1985 by Judith A. Gierut, Professor Emerita of Speech and Hearing Sciences, Indiana University. Through funding from the National Institutes of Health, the project served as a test site in evaluation of the efficacy of clinical treatment for preschool children with functional (nonorganic) phonological disorders. Children who enrolled contributed longitudinal descriptive phonological samples for linguistic analysis. They also received clinical treatment, designed as single-subject experiments, to establish the optimal teaching conditions to promote phonological learning. Experimental studies were based on the triangulation of theoretical models of linguistics, psycholinguistics, and speech-language pathology, with the aim of bridging theory with application and science with best practices. The Gierut / Learnability Project collections accord with the data-sharing plan of the National Institutes of Health and are intended for broad use by scientists, clinicians, and students interested in language and learning.

Indiana University's Learnability Project receives $2.34 million NIH grant

Interdisciplinary project assists children who have severe speech disorders

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BLOOMINGTON, Ind. -- Indiana University's Learnability Project recently received a $2.34 million, five-year renewal of its National Institutes of Health funding, to continue through 2014. More than 1,000 children from across the state and beyond have received free, one-of-a-kind speech therapy through the program since its initial NIH funding in 1985.

The Learnability Project is an interdisciplinary program of IU's Department of Speech and Hearing Sciences and the Department of Linguistics, both part of the university's College of Arts and Sciences.

Participating families are self-selected and receive free treatment for services that researchers estimate are valued at about $4,400 per child. Children who take part in the Learnability Project must be English-speaking 3- to 7-year-olds whose speech difficulties render them virtually incomprehensible.

The project is directed by IU Professor of Speech and Hearing Sciences Judith Gierut, principal investigator on the project, and her husband, Chancellor's Professor of Linguistics and Adjunct Professor of Speech and Hearing Sciences Dan Dinnsen, the co-principal investigator. Michele Morrisette is the associate scientist with the Learnability Project.

After years of working on parallel but separate research tracks -- and pursuing separate funding -- Gierut and Dinnsen finally merged their projects in 1997. The merger brought together Gierut's interest in how children learn, analyzing their day-by-day trajectories, and Dinnsen's interest in how a child's phonology changes through treatment, as well as whether correction of one speech problem impacts another.

Professor of Speech and Hearing Sciences Judith Gierut and Chancellor's Professor of Linguistics and Adjunct Professor of Speech and Hearing Sciences Daniel Dinnsen

"I think the real power and the beauty of our project and our merger is that we can address both the language and the cognitive ingredients that affect these children," said Gierut. "And it was very appealing to the NIH for us to combine our labs -- it's more fiscally responsible."

One key difference between the Learnability Project and others that address phonological delays is that children are taught more complex sounds first, rather than starting with mastery of simple sounds. Researchers say learning the more challenging sounds first makes it simpler for the children to acquire the more basic sounds later.

Other factors that enhance phonological learning include:

* Starting with treatment of sounds the child never produces accurately, instead of starting with sounds a child articulates some of the time
* Treatment of sounds in the context of a consonant blend -- for example, teaching "fl" instead of just "l"
* Treatment of sounds in novel words that are new or unfamiliar to the child

In addition to the core researchers, more than 75 IU undergraduate and graduate students have received research training and financial support through the project over the course of its existence, now nearing 25 years of consistent NIH grant-funding.

The Learnability Project has developed and maintains the largest electronic archive of children's phonological systems in existence. This archive is used to inform research at IU as well as being shared with other national and international scientists. In addition, Gierut said findings from the Learnability Project translate to clinical recommendations that are then taught to and applied by students, most of whom become speech pathologists.

The Learnability Project continues year-round. Researchers work with about five children at a time in individual sessions that last about six months per child with three, one-hour meetings per week. Each family goes through a five-step process to determine whether the child's speech delays are outside the realm of normal:

Step one: An entry screening, in which a standard articulation test is administered and children are asked to name common pictures, such as "house" or "cup."

Step two: Speech sampling, in which the child's speech is audio- and video-recorded for analysis.

Step three: If the speech sampling indicates that the child is typically developing but doesn't produce sounds accurately, parents are asked to complete a brief questionnaire about the child's health and learning history, and children undergo tests of oral-motor structure and function, language tests and a nonverbal intelligence test.

Step four: A treatment program is developed specific to the child's needs. Sessions are scheduled in 60-minute blocks, three times a week, for six months.

Step five: A clinical report summary detailing the child's progress is completed and given to parents along with recommendations for additional treatment, if necessary.

New aspects are added to the project each time funding is renewed, said Gierut. This time around, new research goals relate to how specific words that are treated might jumpstart learning.

"It's about how the input might prime the sound system for learning," she said. "If a child is presented with a Dr. Seuss-like story that has lots of rhyming words and we go on to teach another rhyming word, will that help or hinder what the child is going to be able to learn?"

One of the greatest strengths of their shared research, said Dinnsen, is its interdisciplinary nature. "With my interests in linguistics, I figure out the sound systems these children have, and with Judith's interest in clinical issues and learning, she figures out what we have to do to help the child in clinical treatment."

Dinnsen said early intervention is crucial to the project's success. "Getting in early and making critical changes in the sound system allows the children to learn the rest of the sound system on their own," he said. "Children who come through our project really do extremely well, because we're doing extraordinary things with them."

Ultimately, said Gierut, the project is benefitting the children of the state. "All of the kids that we have seen have received free, cutting-edge treatment. This gives them a necessary platform for continued language development and success."