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.

Content Statement

Learnability Project Working Paper

Participant Eligibility and Demographics

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Learnability Project working papers were developed for internal purposes in the training of research assistants. The material herein first appeared in the Learnability Project Lab Manual, version 1, 1986, and was updated as the protocol expanded. This working paper outlines, in part, the general eligibility criteria and characteristics of participants in the Learnability Project. It is the companion to the Demographic Archive of the DATA collection of the Gierut / Learnability Project. The working paper is not intended as a comprehensive review of phonological disorders or procedures for recruitment and identification of children enrolled in the Learnability Project. The reader is referred to primary source material found in the Publications collection of the Gierut / Learnability Project archived in the IUScholarWorks repository. The following texts and publications may be particularly useful as introductions to the population, experimental design, and lab protocols.

Suggested Readings:

Gast, D. L. (Ed.) (2010). *Single subject research methodology in behavioral sciences*. New York: Routledge.

Gierut, J. A. (1998). Treatment efficacy: Functional phonological disorders in children. *Journal of Speech, Language and Hearing Research*, *41*, S85-S100. PMID: 9493748

Gierut, J. A. (2005). Phonological intervention: The how or the what? In A. Kamhi & K. Pollack (Eds.), *Phonological disorders in children: Clinical decision making in assessment and intervention* (pp. 201-210). Philadelphia: Brookes.

Gierut, J. A. (2008a). Fundamentals of experimental design and treatment. In D. A. Dinnsen & J. A. Gierut (Eds.), *Optimality theory, phonological acquisition and disorders* (pp. 93-118). London: Equinox.

Gierut, J. A. (2008b). Phonological disorders and the developmental phonologies archive. In D. A. Dinnsen & J. A. Gierut (Eds.), *Optimality theory, phonological acquisition and disorders* (pp. 37-92). London: Equinox.

Gierut, J. A., Morrisette, M. L., & Ziemer, S. M. (2010). Nonwords and generalization in children with phonological disorders. *American Journal of Speech-Language Pathology*, *19*, 167-177. PMCID: PMC3281489

McReynolds, L. V., & Kearns, K. P. (1983). *Single-subject experimental designs in communicative disorders*. Baltimore, MD: University Park Press.

Participants

The Learnability Project enrolled preschool children, generally those ages 3 to 7 years, with functional (nonorganic) phonological disorders who were acquiring English as their first (and only) language. Children were recruited through the community through advertisement and with referrals from special service providers. Participation was voluntary, with no monetary compensation for participation. Families received complete diagnostic and clinical services for their child, along with service reports, referrals, and extended care at no cost.

Eligibility

To determine eligibility for participation, children completed an initial screening followed by an in-depth diagnostic evaluation. The screening established that the child was at risk for phonological learning as evidenced by errors in sound production. The diagnostic evaluation confirmed the phonological lag, established that the lag was significant to warrant intervention, and ruled out other contributing factors to the disorder. A core battery of tests was administered, which remained constant over the duration of the project to preserve the integrity of the database for comparison purposes.

Appendix 1 lists the full range of diagnostic tests and measures used to determine a child's eligibility. These include the core measures administered to all children, along with supplementary tests administered on an individual basis depending on a child's presenting profile. Children's results on these measures are reported in the Demographics Archive of the DATA collection of the Gierut / Learnability Project.

In general, to be eligible for participation, children had to be between the ages of 3 and 7 years, and in good health, with the primary distinguishing characteristic being errors in production of the sound system of English. Inclusionary criteria were (1) normal hearing, (2) no evidence of cognitive delay, (3) no known history of organic or motor disorders, (4) normal oral-motor structure and function, (5) performance of at least 1 standard deviation below the mean relative to age- and gender-matched peers on the *Goldman-Fristoe Test of Articulation* (Goldman & Fristoe, 1986/2000), and (6) a reduced phonemic inventory with a minimum of six target English consonants excluded from the pretreatment repertoire across all word positions. Assuming these criteria were met, a child was eligible for participation, barring three exclusionary criteria: (1) concurrent enrollment in a phonological treatment program other than the Learnability Project, (2) acquisition of a first language other than English, and (3) a home environment that was not monolingual. Children who met the minimum inclusionary and exclusionary criteria were eligible to participate, regardless of sex, gender, racial or ethnic background.

References Cited

Goldman, R., & Fristoe, M. (1986/2000). *Goldman-Fristoe test of articulation*. Circle Pines, MN, American Guidance Service.

For more information, visit the Gierut / Learnability Project at IUScholarWorks.

APPENDIX 1

Learnability Project Repertoire of Diagnostic Tests used in Participant Identification

Range of Diagnostic Test Materials	Behavioral Objective of Testing
Audiometric screening (ASHA, 1997)	Evaluates hearing of 1000, 2000, and 4000 Hz tones at 20 dB
Clinical Assessment of Oropharyngeal Motor Development in Young Children (Robbins & Klee, 1987)	Evaluates oral mechanism structure & function (ages 2;6 to 6;11)
Clinical Evaluation of Language Fundamentals-Preschool/Revised (Wiig, Secord & Semel, 1992, 1995, 2004)	Evaluates receptive & expressive language (ages 3;0 to 6;11/5;0 to 16;11)
Expressive Vocabulary Test (Williams, 1997, 2007)	Evaluates expressive vocabulary (ages 2;6 to 90+)
Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 1986; 2000)	Evaluates articulation of target English sounds (ages 2;0 to 21;11)
Illinois Test of Psycholinguinstic Abilities-Revised Auditory sequential memory subtest (Kirk, McCarthy & Kirk, 1968)	Evaluates digit span recall as a reflection of lexical storage and retrieval (ages 4;0 to 8;11)
Leiter International Performance Scale-Revised (Roid & Miller, 1997; Levine, 1986)	Evaluates nonverbal intelligence; also provides memory screen & cognitive/social rating (ages 2;0 to 20;11)
Peabody Picture Vocabulary Test (Dunn & Dunn, 1997, 2007)	Evaluates receptive vocabulary (ages 2;6 to 90+)
Rice/Wexler Test of Early Grammatical Impairment (Rice & Wexler, 2001)	Evaluates receptive & expressive language (ages 3;0 to 8;11)
Test of Early Language Development (Hresko, Reid & Hammill, 1981, 1991, 1999)	Evaluates receptive & expressive language (ages 2;0 to 7;11)
Test of Language Development-Primary (Newcomer & Hammill, 1988, 1997)	Evaluates receptive & expressive language (ages 4;0 to 8;11)

Appendix 1 Diagnostic tests continues…

Range of Diagnostic Test Materials	Behavioral Objective of Testing
Nonword Repetition Task (Dollagahan & Campbell, 1998; Gathercole & Adams, 1993)	Evaluates phonological representations in working memory
Syllable Repetition Task (Shriberg & Lohmeier, 2008)	Evaluates phonological representations in working memory for children presenting with errors in sound production
Percentage Consonant Correct–Revised (Shriberg, Austin, Lewis, McSweeny & Wilson, 1997)	Estimates severity of involvement
Perception-Production Task (Locke, 1980b)	Estimates misperception of speech sounds
Stimulability testing (Powell, Elbert & Dinnsen, 1991)	Samples child's ability to imitate speech sounds

Appendix 1 References

ASHA (1985). Guidelines for identification audiometry. *ASHA*, *27*, 49-52.

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Dunn, L. M., & Dunn, L. M. (1997/2007). *Peabody picture vocabulary test*. Circle Pines, MN: American Guidance Service.

Gathercole, S. E. & Adams, A.-M. (1993). Phonological working memory in very young children. *Developmental Psychology, 29*, 770-778.

Goldman, R., & Fristoe, M. (1986/2000). *Goldman-Fristoe test of articulation*. Circles Pines, MN: American Guidance Service.

Hresko, W. P., Reid, D. K., & Hammill, D. D. (1981/1991/1999). *Test of early language development*. Austin, TX: Pro-Ed.

Kirk, S. A., McCarthy, J. J., & Kirk, W. D. (1968). *Illinois test of psycholinguistic abilities–Revised*. Chicago: University of Illinois Press.

Levine, M. N. (1986). *Leiter international performance scale: a handbook*. Chicago: Stoelting.

Locke, J. L. (1980). The inference of speech perception in the phonologically disordered child, Part II: Some clinically novel procedures, their use, some findings. *Journal of Speech and Hearing Disorders, 45*, 445-68.

Newcomer, P. L., & Hammill, D. D. (1988/1997). *Test of language development–Primary*. Austin, TX: Pro-Ed.

Powell, T. W., Elbert, M., & Dinnsen, D. A. (1991). Stimulability as a factor in the phonologic generalization of misarticulating preschool children. *Journal of Speech and Hearing Research, 34*, 1318-28.

Rice, M., & Wexler, K. (2001). *Rice/Wexler test of early grammatical impairment*. San Antonio, TX: Harcourt Brace.

Robbins, J., & Klee, T. (1987). Clinical assessment of oropharyngeal motor development in young children. *Journal of Speech and Hearing Disorders, 52,* 271-7.

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Shriberg L.D., & Lohmeier, H. L. (2008). The syllable repetition task (SRT). Technical Report 14, Phonology Project, Waisman Center, University of Wisconsin–Madison. Retrieved at http://www.waisman.wisc.edu/phonology/techreports/TREP14_OLD.pdf

Shriberg, L. D., Austin, D., Lewis, B. A., McSweeny, J. L., & Wilson, D. (1997). The percentage of consonants correct (PCC) metric: Extensions and reliability data. *Journal of Speech, Language, and Hearing Research*, *40*, 708-22.

Wiig, E. H., Secord, W., & Semel, E. (1992/1995/2004). *Clinical evaluation of language fundamentals–Preschool*. San Antonio, TX: Harcourt Brace.

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