## Co-Founder. Chief Scientific Officer

Articulate Technologies, Inc.

# speech buddies **Gordy T. Rogers, MS CCC-SLP** Treating misarticulated /r/ with speech buddies<sup>®</sup>: a case study

#### ABSTRACT

This clinical case study investigates the efficacy of the tactile feedback method using the R Speech Buddy<sup>™</sup> on a 9 year old male subject presenting with mild to moderate misarticulation of the /r/ phoneme. After 8 sessions, or approximately 4 hours of therapy, the subject achieved 90% accuracy on a 50 word test battery. Considering the subject's age, severity and level of remediation over the course of therapy, the use of tactile cuing with Speech Buddies dramatically reduced overall time in therapy, as compared to industry norms.



## **Subject**

- 9 year old male
- Mild to moderate misarticulation of /r/ phoneme
- No previous history of speech or articulation therapy for the R sound
- Hearing function within normal limits

#### structural or physiological deficit. Not at risk for language disorder (+9 over criterion score for age-matched peers on Comprehensive Evaluation of Language Function-4 Screening Test)

## Methods

This study sought to replicate a typical articulation therapy regimen with a clinical emphasis on the use of the tactile feedback method, using the R Speech Buddy<sup>™</sup> specially designed to treat the /r/ phoneme. Unwinding a specially engineered coil gives patients tactile confirmation when their tongue is positioned correctly during the production of /r/. **Clinical targets were selected based on the results of the pre-treatment test.** 

Pre and Post Treatment Test: 50 stimulus items

- 40 items: /r/ in word-initial, medial and final positions, singleton (i.e. non-cluster)
- 10 items: /r/ words in sentences

Therapy sessions 1-8: 55 stimulus items per session

- 6 items: /r/ isolation, syllable-initial, syllable-final, Speech Buddy used for all items
- 42 items: /r/ in word-final position, intermittent Speech Buddy use
- 7 items: /r/ in word-medial position, intermittent Speech Buddy use

#### 90% Accuracy in 4 Hours of Therapy **Treatment Time vs. Industry Norms**



• No congenital or acquired neurological,

targets

COI

## Results

• The graph above summarizes the results and shows an average of 90% accuracy was acheived after 4 hours of therapy.

• As was hypothesized, the tactile feedback method, using Speech Buddies, facilitated an early learning breakthrough, whereby the subject was able to correctly produce the target sound in isolation and in syllables.

• The Speech Buddy was used in all six "warm-up" items in all therapy sessions, and the use of the device as a cue was gradually faded over the course of therapy, from approximately every other production in the first two sessions, to approximately every eighth item.

## Conclusions

• Results suggest that the use of tactile feedback featuring an R Speech Buddy for the /r/ phoneme is an effective first-line treatment option for speech-language pathologists treating articulation disorders.

• The Speech Buddy is an effective learning tool for the entire therapy process and this study suggests that once correct retroflexion is acquired and habituated through repeated guided practice, the therapy focus can shift to more "real life" production of /r/, such as words-in-sentences and conversation as the use of the tool tapers.



ASHA NOMS 2005 -2009 (prekindergarden)

Study	Power	Method	Presentation	Age	Hours for Remediation	Remediation Qualification
Rogers	n=1	Tactile Feedback Method using R Speech Buddy	Articulation, R, mild to moderate	9	4.0	90% Accuracy on 50 item test
Taps	n=71	Speech Improvement Class, School District	Articulation, mild, Single Sound Disorders	School Age	"most between 17-20 hours"	Unspecified
ASHA NOMS 2005 -2009*	n=3,598 (portion)	Traditional Therapy	Articulation, varying severity	Pre Kindergarten	21.4	2 or more FCM Improvement*
Jacoby et al.	n=147	Traditional Therapy	Articulation or intelligibility, varying severity	3 to 6	30.4	2 to 3 FCM Improvement*
Jacoby et al.	n=17	Traditional Therapy	Articulation or intelligibility, varying severity	6	49.5	2 to 3 FCM Improvement*

\* ASHA NOMS (National Outcome Measurement System) FCM (Functional Communication Measures) are from a scale of 1 to 7

## Discussion

The 4 hours of therapy required to achieve these results for an articulation disorder of mild to moderate severity was dramatically lower than a typical articulation therapy regimen, as compared to industry averages reported in ASHA NOMS 2009; Jacoby, 2002; Taps, 2008.

While no specific "homework" exercises were assigned by the clinician during the study, the easy use of the tool by a trained parent at home of sessions and supported by an online therapy exercise module, could further reduce the remidation time.

While tactile cuing is not new in the field of speech-language pathology (Ruscello, 1995), the Speech Buddies represent an optimally designed and engineered embodiment of tactile cuing. The results from this study are consistent with previous, larger scale efficacy studies (e.g. Clark, Schwarz Blakeley, 1993). However, design, materials and cost effectiveness make the Speech Buddy tool a more applicable means of applying tactile feedback.

While the current results were obtained from a single subject, the study design's replication of a classic model of service for speech sound disorders suggests that these results would be generally applicable to the average patient presenting with misarticulated /r/. A larger scale, blinded, controlled, efficacy study could further establish a strong evidence base for tactile cuing using the R Speech Buddy. **References:** 

Clark, C.E, Schwarz, I.E, Blakeley, R.W. (1993). The Removable R-appliance as a practice device to facilitate correct production of /r/. American Journal of Speech-Language Pathology, 2, 84-92 Jacoby, G.P, Lee, L., Kummer, A.W. Levin, L, Creaghead, N.A. (2002). The Number of Individual Treatment Units Necessary to Facilitate Functional Communication Improvements in the Speech and-Language of Young Children, American Journal of Speech-Language Pathology, 11, 370-80. Ruscello, D.M. (1995). Speech appliances in the treatment of phonological disorders, Journal of Communication Disorders, 28, 331-353 Taps, J. "RTI Services for Children with Mild Articulation Needs: Four Years of Data," ASHA Perspectives on School-Based Issues 9 (2008): 104-110. "National Outcome Measurement System Pre-Kindergarten Report," American Speech-Language Hearing Association, 2009, 15.

