Clinical Feasibility of Visual Analog Scaling

Bita Payesteh, MS & Benjamin Munson, PhD
Department of Speech-Language-Hearing Sciences, University of Minnesota

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Introduction

- Current protocol when working with children with speech sound disorders (SSD) is to use phonetic transcription, which is not flexible and "paint[s] a very incomplete portrait of the acquisition of...sounds" (Munson, Schellinger, and Urberg Carlson, 2012).
- It does not allow for the assessment of subtle phonetic changes either in normal speech sound development or in speech sound learning by children undergoing speech and language therapy.
  - A child who produces the "sh" sound as "s", will have her attempts at /ʃ/ transcribed as either /s/ (when incorrect) or /ʃ/ (once correct).
  - It is important to note that acoustic studies of children's speech show that children like this child will not go from producing /s/ to suddenly producing /ʃ/ clearly.
- Visual Analog Scaling (VAS) is a simple technique in which clinicians rate productions (i.e., of target "sh") along a particular dimension (from "s" to "sh") by marking the proximity of each production to the ideal endpoints.
- VAS has been tested in laboratory experiemnts, but is it a feasible and accurate tool for SLPs to measure progress through speech therapy by children who have speech sound disorders (SSD)?

Research Questions

- The purpose of the study was to:
  - assess feasibility of VAS for SLP graduate student clinicians working with children with SSD, and
  - examine the extent to which VAS measures in the clinical setting correlate with VAS measures of the same speech tokens in a laboratory setting.

Participants

- **Clinicial Setting:**
  - Two Speech-Language Pathology graduate student clinicians who were completing their practicum in the university clinic of a large Midwestern university.
  - Four children, 5 to 14 years old, whose primary diagnosis was SSD.
- **Laboratory Setting:**
  - Eighteen undergraduate (n = 12) and graduate (n = 6) students with varying levels of experience working with children.

Procedures

- Clinical Setting:
  - Graduate student clinicians completed a short training, familiarizing them with the VAS.
  - In each therapy session, the clinicians asked their client to say 10 probe words, based on one sound they were working on; this list included an additional 10 filler words.
  - Clinicians rated the target sound from the probe words using the VAS and simultaneously audio-recorded the child's productions (Figure 1).
  - Clinicians completed a survey at the end of the study to determine effectiveness and feasibility of VAS in a clinical setting (Figure 2).
- Laboratory Setting:
  - Undergraduate and graduate students listened to the recordings of the four children's speech and rated the target sounds on the VAS.

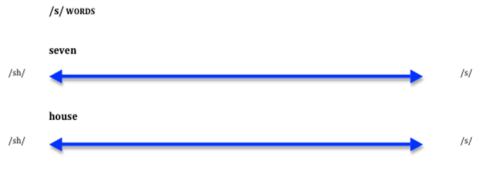


Figure 1 *Sample of the VAS for a child working on /s/*

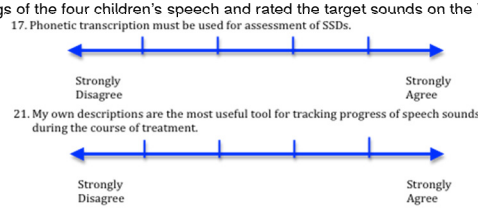


Figure 2 *Survey questions for the graduate student clinician*

Analysis & Correlations

- Qualitative data from surveying the two graduate student clinicians determined the feasibility of VAS as a clinical measure.
- Correlations between the clinicians' ratings for each item and the average rating by the naïve listeners were calculated separately for each child (Figures 3 through 6) and pooled across children (Table 1).

Figure 3 *Correlation of Clinician 1 and laboratory ratings of child working on /r/*

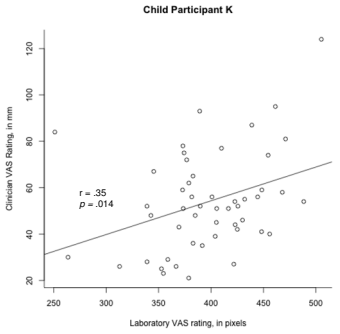


Figure 5 *Correlation of Clinician 1 and laboratory ratings of child working on /s/*

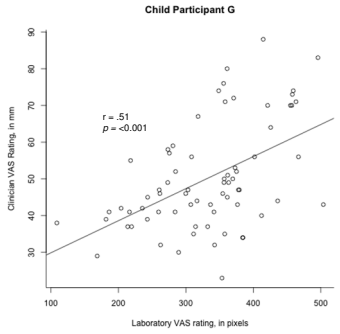


Figure 4 *Correlation of Clinician 2 and laboratory ratings of child working on /ʃ/*

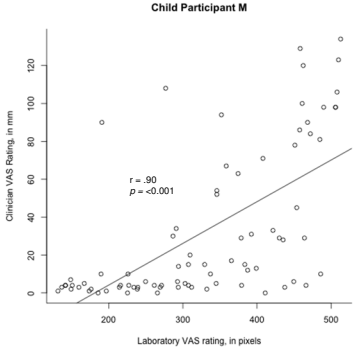
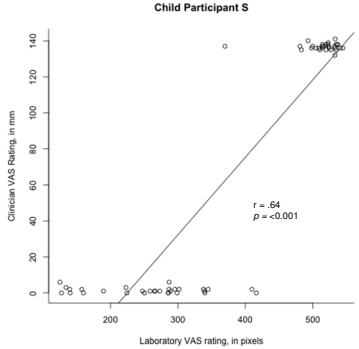


Figure 6 *Correlation of Clinician 2 and laboratory ratings of child working on /k/*



Results

	Clinician Rating	Laboratory Rating
Clinician Rating	---	0.728[a]
Laboratory Rating	<0.001[b]	---

Table 1 *Correlation coefficient (a) and p-value (b) for VAS ratings*

- Both student clinicians provided positive feedback in a post-study survey.
  - Both stated they thought phonetic transcription was necessary for assessment of SSDs, but that for tracking progress of speech sounds, their own descriptions were more useful.
  - On a scale of 1 to 6, strongly disagree to strongly agree, the student clinicians gave a 3.5 and 4.5 to the item: *The VAS was the most useful tool for tracking progress of speech sounds during the course of treatment.*
  - One drawback the clinicians mentioned was that it would be difficult to quantify this information for reports.
- Overall, the clinicians' ratings appear to be correlated with the laboratory ratings
  - /r/ showed the lowest correlations between sets of ratings; /ʃ/ had the highest correlation; /s/ had a moderate-sized correlation. The ratings for /k/ were moderately correlated, but the clinician's perception was more categorical than the naïve listeners'

Discussion & Implications

- The VAS shows promise in being an effective and efficient tool for clinicians to utilize in tracking progress of speech sounds.
- In the future, we will utilize an acoustic analysis to determine VAS accuracy of both graduate student clinicians and the naïve listeners .
  - A follow-up study will be conducted with more participants over a longer period of time to determine if the VAS can show progress over time

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Key Reference

- Munson, B., Schellinger, S.K., & Urberg-Carlson, K (2012). Measuring speech-sound learning using visual analog scaling. *Perspectives in Language Learning and Education*, 19, 19-30.