Telepractice assessment of receptive language using the PPVT-4

Mark VanDam, Alyssa Anderson, Hannah Ahmann, & Nancy Potter
Speech and Language Laboratory
Washington State University

Main research questions

1. Do test scores reflect administration type?
2. Does test time reflect administration type?
3. Was test performance affected by testing format order or other variables?

Background

Telerehabilitation and Speech-Language Pathology.
Telerehabilitation is the assessment and treatment from a health practitioner or therapist, through an electronic medium, to a patient/client in another geographical area. Many health professions, including those in Speech-Language Pathology, are utilizing this method of treatment and therapy because of mutual benefits for practitioner and patient alike; including: reaching rural clients, and clients being able to seek specialized consultation and therapy for rare cases.

The Peabody Picture Vocabulary Test- Fourth Edition:
The PPVT-4 is a receptive vocabulary assessment used in the field of Speech-Language Pathology and other fields to assess receptive language throughout the lifespan. Traditional administration requires an SLP (or other professional) to be physically present while administering. This requirement is not cost effective and reduces the number of clients an SLP may be able to assess.

Purpose: . The purpose of this study was to determine if a web-based version of a commonly used and standardized assessment tool, such as the PPVT-4, could be administered through a web-based medium for school-aged children.

Method

Participants

► 34 typically developing children
   a) English as primary language
   b) Home access to computer & internet
   c) No learning disorder/delay per parent report
note: data from 19 participants is not included due to technical problems.
► Age: M=9;6 (SD=2.2, range:4;10-12;10)
► 57% male; 43% female
► 90% white (29/34 reported race)
► SES: 76% Mother with BA or higher;
   US national average is 29%
► Children from rural and urban cities in Eastern Wash.

Materials

► Peabody Picture Vocabulary Test-
Fourth Edition (PPVT-4) test forms A and B, picture stimuli, and manual
► Laptop computer with internet access
► Web-based version of PPVT-4
   a) mastered recordings of audio stimuli with trained female voice; one exact carrier phrase
   b) PPVT panel images presented (JPG at 96 dpi) with mouse-selectable areas
   c) custom web interface and database design (HTML5, PHP, SQL) for speed, reliability, and automation
   d) familiarization, start item, test administration, scoring, demographics conducted in interface
   e) additional demographic and user details collected, including RT, item analyses, etc.

Procedure

► Administration order was randomized by test version (A, B) and administration type (computer, paper)

	Computer	Paper
Form A	Computer A	Paper A
From B	Computer B	Paper B

► Both administration types (paper, internet) followed testing guidelines recommended by PPVT manual.
► Test-retest 30 minutes to one week for each child.
► Scoring and timing manually computed for paper versions; automatically computed and securely stored for computer version.
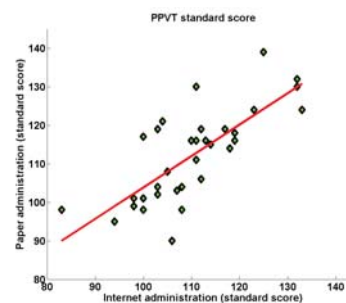

Figure 1. Each participant's traditional-paper standard scores compared with their own web-based standard scores.
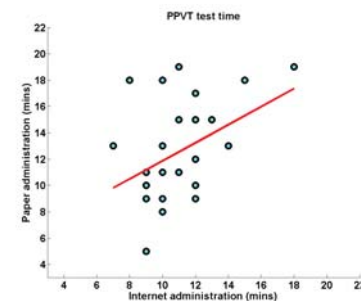

Figure 2. Each participant's traditional-paper total test time compared with their own web-based total testing time.

	Paper M (SD)	Web-based M (SD)	Pooled M (SD)
Standard score	111 (12)	109 (11)	110 (11)
Testing time	12 (3)	11 (2)	11 (3)
Raw score	157 (26)	155 (27)	156 (26)

Table 1. Descriptive statistics for observed values of dependent measures.

	Spearman's correlation	*p*-value
Standard score	.74	<.0001
Testing time	.39	.040
Raw score	.86	<.0001

Table 2. Correlations between traditional paper and web-based administration of the PPVT-4. Standard scores and overall testing times given.

Results

1. **There was a significant correlation between traditional-paper and web-based standard scores (and raw scores).**

2. **There was a significant correlation between traditional-paper and web-based testing times.**

3. **There were no experimental order effects observed for either standard score or administration time (all values p>.05)**

4. **There were no observed effects of age, sex, race, SES, or geographic region (all values p>.05).**

Conclusions

Findings suggest that web-based implementation of a standardized test, such as the PPVT-4, may be reliably used in research, clinical, and educational settings. Implementation of web- based assessments using an internet interface in a telerehabilitation setting, may:

1. **Reduce overall costs of test administration**

2. **Improve the assessment quality to target groups**

3. **Increase the accessibility to the test for those in need.**

Future directions

1. **Continue to establish baseline relationship between traditional and telehealth tests (i.e., collect more data).**

2. **Extend testing to disordered and at-risk populations and explore efficacy of telehealth assessment with non-typical populations.**

3. **Explore fine detail of response patterns, including item-analysis and decision processes related to test performance.**

For references and extended discussion, see also :
Anderson, A. (2014). *Web-based Telerehabilitation Assessment of Receptive Language.* Unpublished master's thesis, Washington State University.
`http://speechsci.com/docs5/Anderson_2014.pdf`