

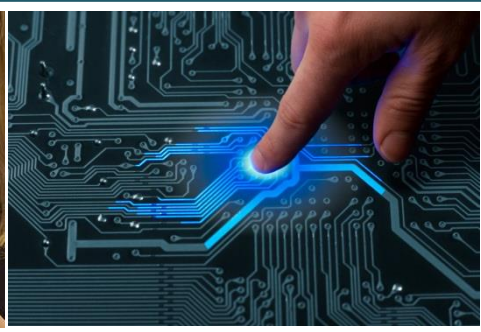
Factor analysis of the skills encompassing auditory and cognitive abilities of 8 – 11 year-old children

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Introduction

Defined Auditory Processing.

Speech and Language assessments recommended.

Specifically, cognitive abilities not identified.

ASHA (2005)

Limitations of the pure-tone audiogram.

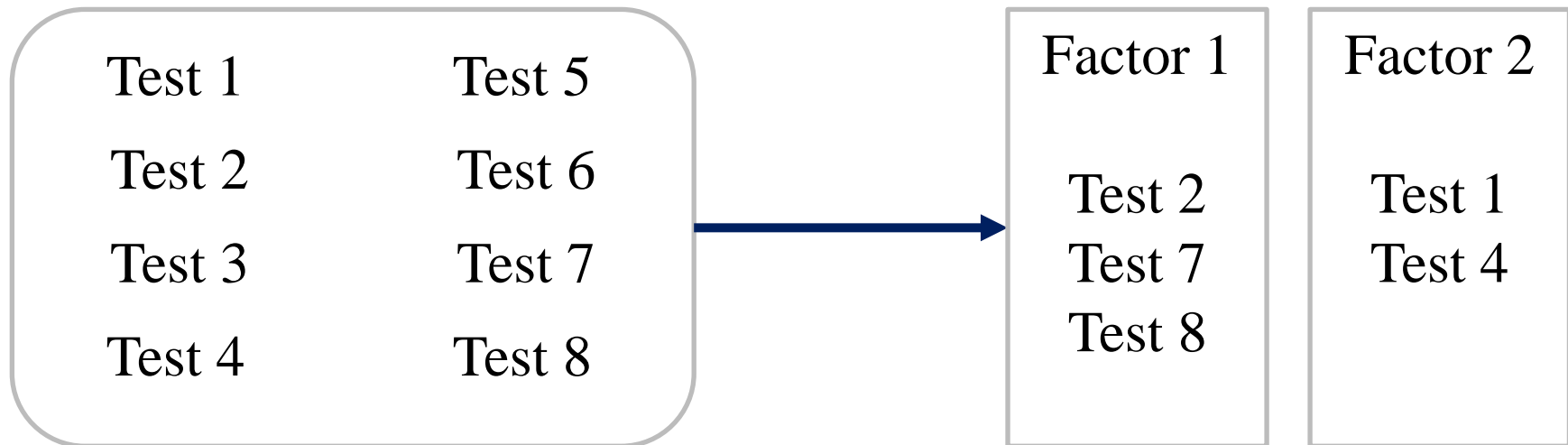
Listening problems neither identified nor treated before 7 years of age.

Importance of cognitive functions, and their impairments.

BSA (2018)

Which tests to use?

Factor Analysis: statistical method used to reduce a large number of variables into fewer factors to explain maximum variance within the population.



(Field, 2009)

Assessment of Children With Suspected Auditory Processing Disorder: A Factor Analysis Study

Article *in* Ear and hearing · February 2014

Factor 1	Factor 2	Factor 3
Speech and tone in noise and discrimination (7 tasks including: Temporal masking; Auditory figure ground; Filtered words)	Word Reading, memory, and dichotic listening (6 tasks including: Word & non-word reading, competing words)	Visual and auditory attention (4 tasks including: cued and non-cued)

Variance explained 47.9%

Aim

- To clarify the role of the cognitive measures alongside the auditory processing and word reading measures in identifying deficits in children.

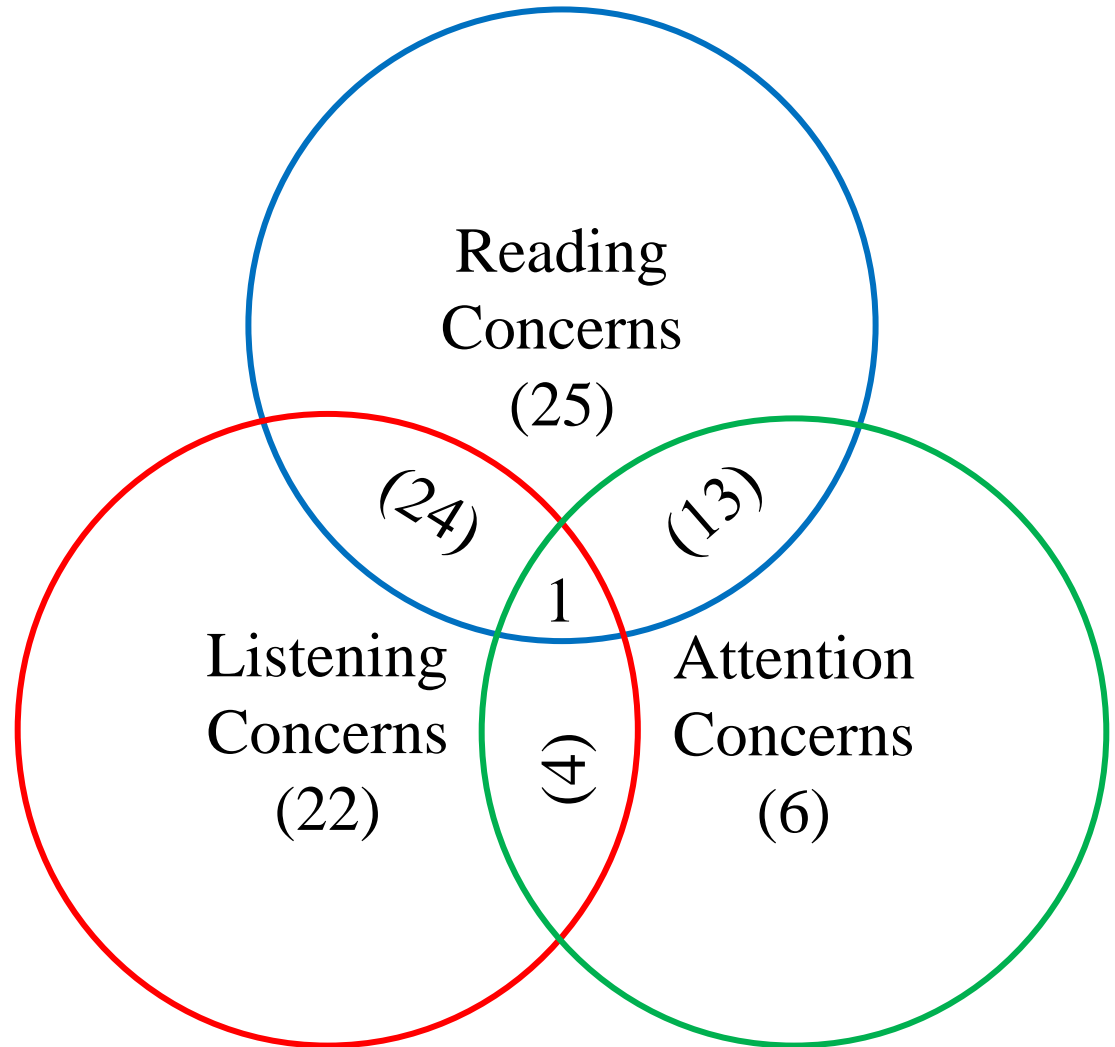
Methodology

- 95 kids
(59 males, and 36 females)

8 – 11 years old;

English speaking;

normal Audiometric
thresholds



Auditory Processing

- Dichotic Digit difference Test
- Gaps in Noise
- Frequency Pattern Test
- Listening in Spatialized Noise - Sentences
- Frequency discrimination
- Iterated Rippled Noise
- Sinusoidal Amplitude Modulation

Reading

- Word reading
- Non-word reading

Visual Attention

- Selective Attention
- Attention Switching

Working Memory

- Digit Backwards

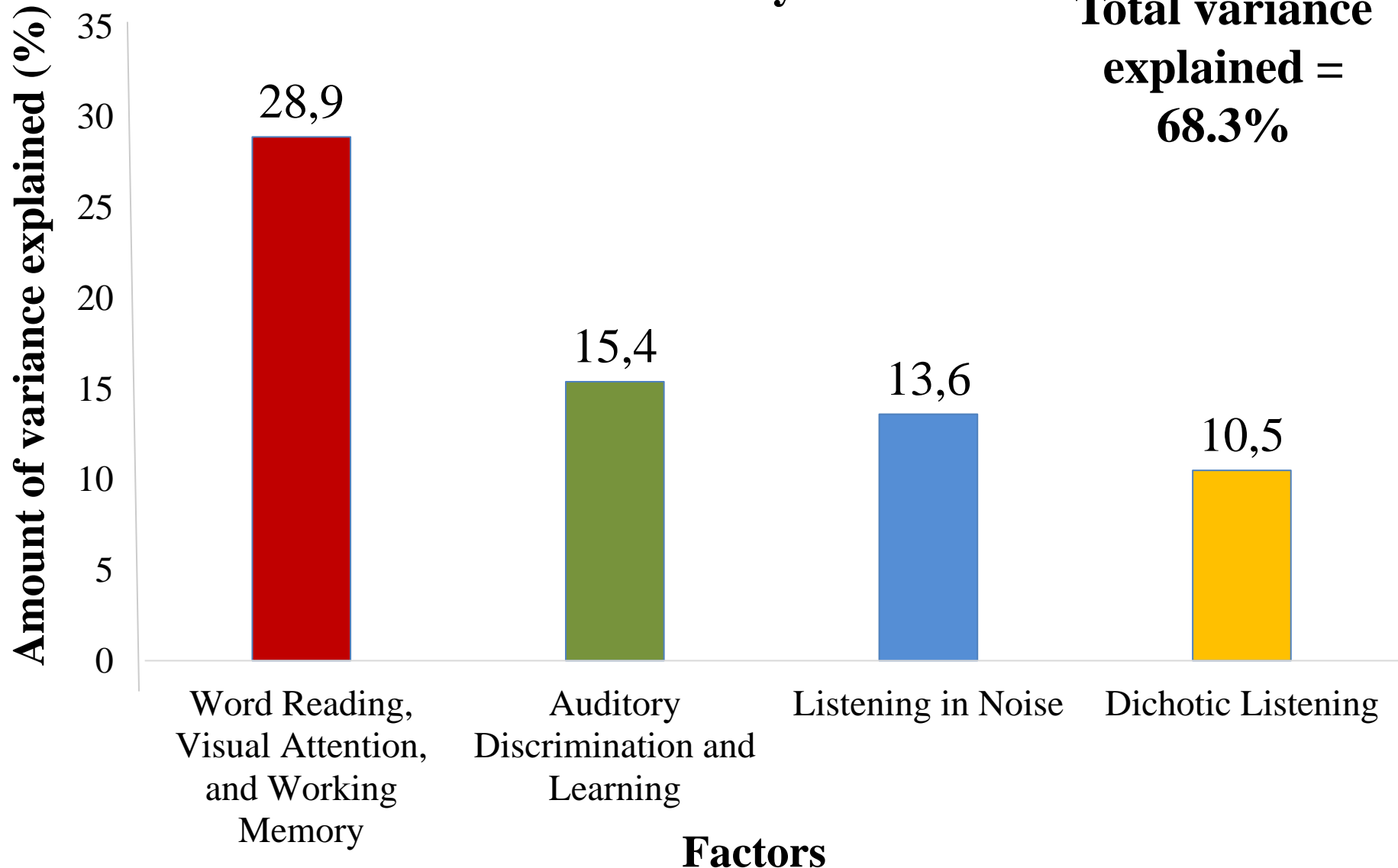
Statistical Learning

- Auditory Statistical Learning

Highly correlated ($r > 0.7$) measures were averaged.

Factor Analysis

Total variance explained = 68.3%



- Reading, auditory processing, visual attention, and working memory, all contributed to explaining distinct parts of the population.
- Using only AP measures, we can explain 78% variance within the population
 - Frequency pattern, Dichotic Digit difference, Listening in Spatialized noise, and Frequency discrimination

- Our results are in contrast to Ahmmed et al (2014) as we explained more variance with fewer variables just including auditory processing tasks. This may be due to:
 1. Ahmmed's study included 6-11yrs age range; we have 8-11yrs.
 2. Attention and memory are correlated to the auditory processing tasks (Sharma et al 2009).
- Sample size is another consideration (Field 2009).
- 44% of participants in the current cohort have come with comorbid concerns of reading and listening; yet AP measures explain most of the variance.

- What does this mean?
- Are we saying that irrespective of the co-existing concerns, auditory processing is the most common concern? Surprising, yes!
- Children with specific reading concerns within the 95 children → to determine which auditory processing skills are impacted
- Also look at the cognitive skills to obtain a panoramic view of their auditory, and learning skills.
- Still a long way to go...

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