

Comprehension of Prosody by Children with Speech and Language Disorders

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Pragmatics

- Pragmatics area of language which addresses rules that govern specific use of language in social situations.
- Verbal rules include staying on topic and turn taking; nonverbal rules include keeping proper distance between the speaker and listener and using appropriate facial expression and eye contact (ASHA, 1990).
- To be pragmatically competent, person must apply pragmatic rules in receptive and expressive tasks.



Prosody

- To be effective communicator and demonstrate pragmatic competence, must possess skills to comprehend both segments and suprasegmental aspects which are “properties of the speech signal that modulate and enhance its meaning” (Shriberg, Paul, McSweeny, Klin, Cohen, & Volmar, 2001).
- Prosody has significant effect on message and way listener perceives it. Features include pitch, duration, and intensity, and overlay segments of utterance to give meaning.

Prosody in the Brain

- “If it is confirmed that semantics (meaning derived from linguistic competence) is subserved by areas of the left hemisphere and pragmatics (meaning inferred from nonlinguistic phenomena) is subserved by areas of the right hemisphere, it may be possible to determine whether a particular type of problematic meaning, in the grey area between the two, is treated neurolinguistically as semantic or pragmatic, depending on its vulnerability to a right or left hemisphere cerebrovascular accident” (Paradis, 5, 1998).



Prosody on the Brain

- Research conducted with variety of subjects, including individuals with brain lesions and agenesis of corpus callosum.
- Shipley-Brown et al. (1998) investigated which hemisphere of brain responsible for processing both affective and linguistic intonations.
- Research has indicated that corpus callosum necessary for comprehension of affective prosody and recognition of literal and nonliteral language in conversation (Paul et al., 2003; Brown et al., 2004).



Prosody

- Ability to comprehend and recognize paralinguistic or prosodic features in conversation; critical skill for effective communication, especially for detecting sincerity (Paradis, 1998).
- Prosody labels communicator as appropriate or inappropriate



Nonliteral Language

- Impairment in ability to comprehend prosodic features can compromise ability to recognize literal and nonliteral language.
- Nonliteral language characterized by existence of discrepancy between what is said (literal meaning) and what is meant (nonliteral meaning)” (Milosky & Ford, 1997).



Nonliteral Language

- For communicative partner to recognize speaker's intentions, inferred knowledge required.
 - Listener need to recognize that speaker did not literally mean what was said (Capelli, Nakagawa, & Madden, 1990).
 - To determine sincerity of speaker, listener must have basic knowledge about speaker and event context in which remark was made. Require listener to process lexicon, as well as speaker's tone of voice, body language, and facial expression.



Developmental Aspects of Prosody

- Studies conducted to analyze children's ability to comprehend sarcastic requests (Capelli et al., 1990; Milosky & Ford, 1997; Laval & Bert-Erboul, A., 2005).
- Average age range for understanding speaker's intention based on prosodic cues between 7-9 years (Capelli et al., 1990; Milosky & Ford, 1997; Laval & Bert-Erboul, A., 2005).
- Conclusion: Recognizing prosody is developmental skill

Developmental Aspects of Prosody

- According to Gerken and McGregor (1998), prosody becoming important aspect of language to research, particularly in child language development, adult perception and production, and language disorders affecting children and adults.
- “Prosodic bootstrapping” is hypothesized technique infants use by listening to prosodic boundary cues to separate utterance and segments into important morphemes (Gerken & McGregor, 41, 1998).
- Children with specific language impairments demonstrated significant difficulties perceiving prosodic features, resulting in inability to use “prosodic bootstrapping” techniques to separate speech into units, which facilitates development of syntactic skills (Gerken & McGregor, 41, 1998).



Disorders w/Concurrent Prosodic Deficits

- Prosodic deficits noted in people with hearing impairment and autistic spectrum disorder (Zeiser & Erber, 1977; Paul et al., 2005; Shriberg et al., 2001).
- Zeiser & Erber concluded need to teach children with profound-hearing impairments ways to recognize prosodic elements in speech, possibly integrating sensory perception strategies to teach identifying grammatical prosody.
- Children with ASD have trouble recognizing and/or comprehending affective prosody, making them pragmatically deficient (Shriberg et al., 2001).



Autism and Prosody

- Paul, Augustyn, Klin, and Volkmar (2005) investigated perception and production of prosody by speakers with autistic spectrum disorder (ASD)
- Paul et al. (2005): Other areas of language improve in individuals with ASD, prosodic differences persistent.
- Minimal research conducted on perception of prosody in autistic spectrum disorders, except in area of affective prosody, ASD have difficulty perceiving emotional tone in speech and matching to appropriate facial expression (Paul et al., 2005).



Purpose

- Current study designed to investigate competence for interpreting prosodic features at sentence level in children with developmental speech and language disorder.



Research Question

- Do children with diagnosed developmental speech or language disorders exhibit deficits in prosodic interpretation of sentences, and how does their performance compare?

Subject Selection

- Subjects included:
 - Males and females, ages 7-9
 - Diagnosis: speech-language impairment
 - Average intelligence
 - Normal Hearing acuity
 - Use of English as primary language
 - Clients at EIU Speech-Language Hearing Clinic



Subject Selection

- Group A: Speech
 - Articulation
 - Fluency

- Group B: Language
 - Language processing
 - Receptive and expressive language delays
 - High-functioning autism

Methodology

- Group comparative design
- Each subject administered Subtest G of The Differential Screening Test for Processing (Richard, G. & Ferre, J., 2006), to assess prosodic interpretation of sentences.
- Subtest included 12 items on CD read by male speaker
- Intonation modified to sound “sincere” or “insincere.”
- Subject required to listen to sentence and respond “yes” or “no” regarding if sincere
- Listener’s answer reflected ability to recognize and interpret prosodic cues overlaying message.
- Administration duration: 3 minutes and 30 seconds.

Methodology

- Reliability- clinician and researcher recorded subject's responses on published test form of The Differential Screening Test for Processing (Richard, G. & Ferre, J., 2006). Testing also videotaped.
- A pass-fail score generated for each subject based on age-related norms of The Differential Screening Test for Processing (Richard, G. & Ferre, J., 2006).
- Data analysis revealed:
 - 1) percent of subjects in both groups, speech and language, that passed screening test
 - 2) whether significant difference existed between speech and language groups' performance on subtest



Data Analysis

- Inferential and descriptive statistics applied.
- Nominal level data (pass/fail) analyzed by calculating percentage of subjects in each group who passed subtest.
- Ratio level data (raw scores) analyzed to determine if significant difference existed between speech vs. language group performance. Two-tailed t-test for independent samples applied.
- Descriptive analyses calculated: mean, SD, range.

Results

- Speech deficit group
 - N=3
 - 100% of subjects “passed” subtest
- Language deficit group
 - N=8
 - 25% of subjects “passed” subtest
- Results from t-test revealed significant difference in test performance between speech and language group [$t = 2.14$; $p \leq .05$]



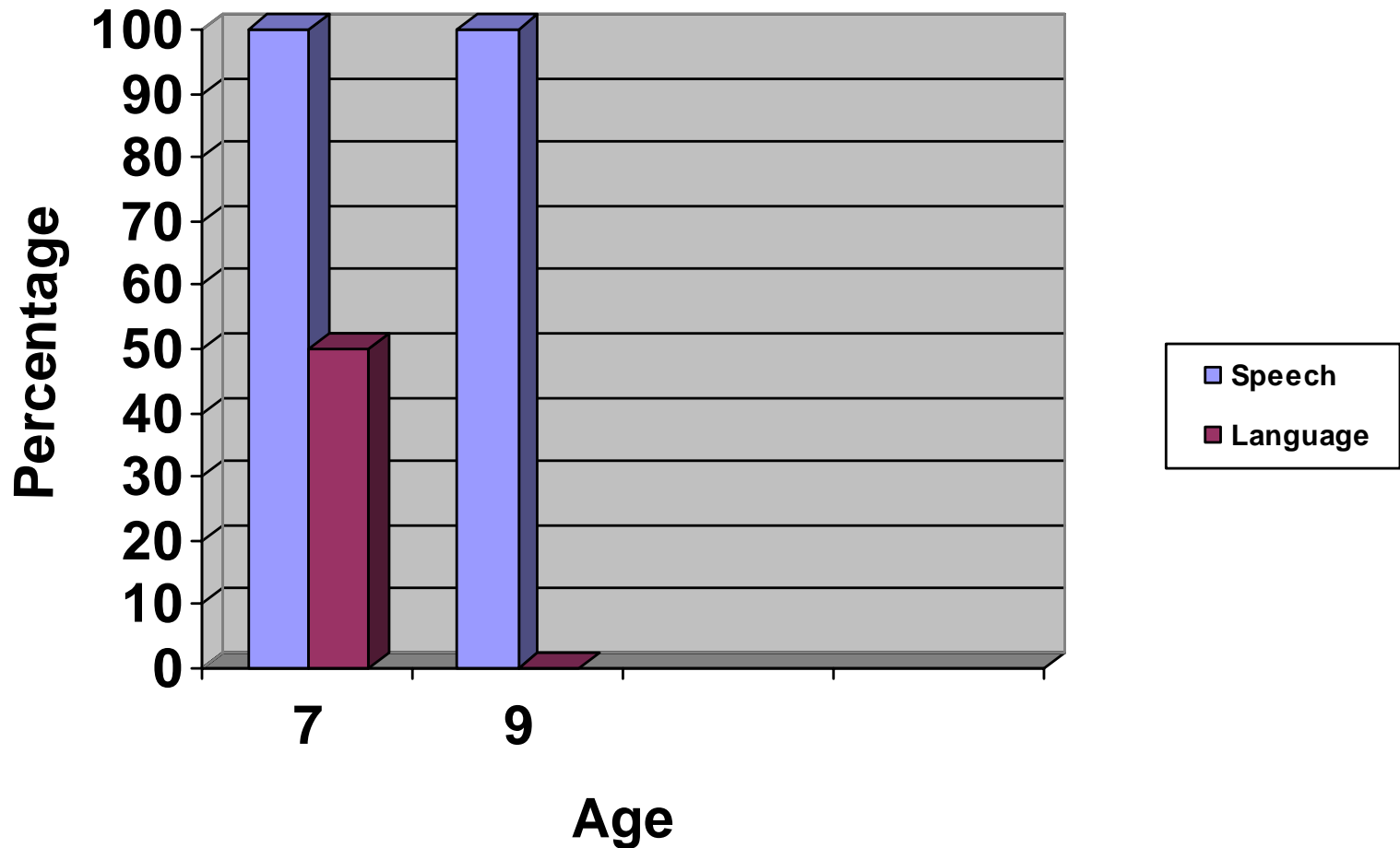
Results: Descriptive Analysis

- Speech Deficit Group
 - Mean= 10.0
 - Range= 5 (7.0-12.0)
 - SD= 2.65

- Language Deficit Group
 - Mean= 7.68
 - Range= 2 (7.0-9.0)
 - SD= 0.690

Results

■ Subjects who passed subtest



Conclusion

- Children with speech deficits (artic/fluency) demonstrated no difficulty interpreting prosodic cues.
- Children with language deficits (language processing deficits, receptive and expressive language delays, and high-functioning autism) demonstrated significant difficulty interpreting prosodic cues.
- There was significant difference between groups in prosodic recognition, suggesting that children with speech-only deficits process prosodic cues more effectively than children with language disorders.
- Children with language deficits often display difficulty in interpreting prosodic cues. It is important to consider prosody in assessment and treatment of language disorders.



Strengths and Limitations

■ Strengths

- Reliability of scoring established, where inter-rater reliability was 95%.

■ Limitations

- Small sample of subjects
- Not diverse population
- Researcher tested subjects with knowledge of group status.
- Differences in testing occurred



Need for Future Research

- Future research could expand examination of prosodic deficits in language impairment:
 - larger population of subjects with more specific disorders
 - Different disorders or types of prosody
 - In order to identify more children experiencing prosodic deficits and to heighten awareness to include prosody during assessments.
- Treatment of prosodic deficits needs to be developed.



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