**Identifying Features of ASD Language Impairment in Narrative Retellings**

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**Background**

**Motivation**
- Although language difficulties are not among the diagnostic criteria for ASD, they are frequently observed in the ASD population.
- Are these language difficulties in some children with ASD indicative of a co-morbid developmental language disorder (DLD)?
- Alternatively, are they characteristic of a distinct subtype of ASD?
- Narrative recall performance correlates with language measures.
- Do children with DLD perform at the same level as children with ASD who meet the criteria for a language disorder?
- Are there differing patterns of recall in the two groups?

**Objectives**
- Explore diagnostic utility of the NEPSY Narrative Memory subtest [1].
- Determine whether alternative method of scoring retellings can reveal differences in language impairment between children with DLD and children with ASD who meet criteria for a language disorder.

**Data**

**Experimental Subjects**
- ASD diagnosis: ADOS, ADI-R, DSM-IV criteria
- DLD diagnosis: Tomblin Epi-SLI criteria [2] or a CELF index score at -1 s.d. plus a spontaneous language measure at -1 s.d.
- Large subset of ASD children met criteria for DLD (ASD+DLD)
- All diagnoses made via clinical consensus.

**NEPSY Narrative Memory (Free Recall)**
- Subject listens to NEPSY narrative, then retells the story to the examiner.
- During examination, the examiner notes the number of story elements the subject uses in his retelling: summary score.
- Retellings transcribed for off-line scoring and analysis.

**Standard Scoring**

- **Objectives**
  - Child receives two points for every correctly recalled story element.
  - Score: sum of these points, ranging from 0 to 34.

**Story Elements**

| 1. Jim | 7. climbed the tree/oak | 13. Anna |
| 2. Pepper | 8. got a ladder or carried a ladder to the tree |
| 3. big | 9. looked out over the neighborhood or looked around |
| 4. black | 10. slipped, shoe fell, ladder fell, get stuck, or couldn’t get down |
| 5. liked to walk in the woods or climb trees | 11. Pepper ran for help, went to get help, or ran away |
| 6. tree/oak with branches too high for Jim to reach | 12. Jim was sad or thought Pepper didn’t want to stay |

**Alignment Scoring**

- **Objectives**
  - Try to find a match in the source narrative for each word in the retelling as a measure of how on-topic the retelling is.
  - Score: percentage of words in a retelling that can be aligned to the narrative, ranging from 0 to 100.

**Example Retellings and Scores**

- He had a friend named Pepper. Pepper was a black dog. Pepper got his shoe. I don’t know. Jim was a little boy. Pepper was his friend. Pepper was a black dog, and Pepper rescued his shoe when he brought it to Anna. That’s all I know. And then they, then Anna rescued him. **Alignment score = 56.1%**

- The way he go down and hurt himself. His shoe fell off. And the ladder go down to the ground. The boy took a picture of the girl. And he stopped taking a picture. And he was about to walk to the best thing. He went off to the zoo, and the girl went on with us, too because she went to the zoo. She sold lots of animals, and the boy sells lots of animals, too. **Alignment score = 21.1%**

**Results**

- **Objectives**
  - Both scoring procedures distinguish between groups meeting the criteria for a language disorder and other groups.
  - The alignment scoring method additionally distinguishes between DLD-only group and ASD subgroup meeting the DLD criteria.
  - This suggests that retelling may tap into something specific about language impairment in ASD:
    - ASD+DLD children include off-topic content in their retellings.
    - DLD children report the facts, albeit with great difficulty and without the required story elements.

**Conclusions and Future Work**

- Novel scoring method for NEPSY Narrative Memory subtest reveals differences in retelling strategies in DLD and ASD with DLD.
- Offers utility for distinguishing DLD from ASD-related language impairment.
- Future work will focus on generating alignments automatically using existing computerized techniques and exploring other features extracted from these alignments.

**References and Acknowledgements**


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