Contrastive stress in typically developing children and adults. Possible therapeutic applications for children in the Autism spectrum
What do we know?

• Usually, there are two impaired language abilities in Highly Verbal Children in the Autism Spectrum:
  • Prosody
  • Pragmatics
  • Why?
What do we know?

• Why is prosody so important?
• “Intonation is a powerful tool for navigating discourse, which demands constant referential updates amongst alternatives.” (Ito et al. 2012)
• It is used to signal important or contrastive information in the discourse.
• It is connected to the pragmatic intent of speakers.
How does “Contrastive Stress” work pragmatically?
The Experiments

• Three Experiments: Global Ambiguity, Temporal Ambiguity, Production.
• Two Standardized tests.
• Test Adults and TD Children (7-10 yos) and compare the differences.
• Test ASD Children and see in what ways they differ.
• Try to develop training methods that would improve the ASD Children’s results.
Global Ambiguity Task

No, I don’t want the BLUE hat.- Color-contrast
No, I don’t want the blue HAT.- Noun-contrast
No, I don’t want the blue hat.- Control
Global Ambiguity Task

![Bar chart showing the percentage of children in offline and control conditions for Red Hat, Blue Shirt, and Green Shirt contrasts.](chart.png)
Global Ambiguity Task

- Control
- Color Contras
- Noun Contrast

Chart showing: % Red Hat, % Blue Shirt, % Green Shirt

Adults
Global Ambiguity Task

![Graph showing the relationship between time and red hat and blue shirt percentages after noun onset.](image)
Global Ambiguity Task

Children

% red hat – % blue shirt

Time after Noun Onset

Control
Color Contrast
Noun Contrast

(*)

(*)

(*)
Summary of the Global Ambiguity Task data

• Children showed an early effect of contrastive stress in online measures, but no effect in offline measures.
• Adults show late effect of Contrastive Stress in online measures and a significant effect in offline measures.
• Children are still developing the ability to use Contrastive Stress explicitly.
• Why are adults slower in online measures?
**Temporary Ambiguity Task**

- Four conditions:
  - green bike...YELLOW bike.
  - green bike...yellow bike.
  - green bike....YELLOW mitten.
  - Green bike...yellow mitten.

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Ito et al. (2012), Nappa&Snedeker (in preparation)
Temporary Ambiguity Task

![Graph showing looks to bikes over time after noun onset for green bike and yellow bike with annotations for adults and young adults.](image)
Temporary Ambiguity Task

Children

Looks to bikes

Time after Noun Onset

bike

0

200

400

600

800

1000

green bike...yellow bike

green bike...yellow mitten

mitten

*
Summary of the Temporary Ambiguity Task data

• Adults show an effect of contrastive stress in online measures.
• Children only showed a reliable effect in the “green bike...YELLOW mitten” condition.
• Due to a strong anaphoric bias?
Production Task

- Red triangle – YELLOW triangle
- Red circle – red TRIANGLE
- Red circle – blue triangle
Production Task

**red vs. RED: Duration**

- Adults: Red star < RED star
- Kids: Red star > RED star

**red vs. RED: Pitch Range**

- Adults: Red star < RED star
- Kids: Red star > RED star

**star vs. STAR: Duration**

- Adults: Red star < STAR
- Kids: Red star = STAR

**star vs. STAR: Pitch Range**

- Adults: Red star < STAR
- Kids: Red star = STAR
Summary of the Production Task

• Children were similar to adults in using prosody to mark pragmatic intention.
• This is further evidence to show that children are already developing this ability even if they are not able to use it in every single task.
General Summary

• What do children know about Contrastive Stress?
• They use it in online measures.
• Nevertheless, it seems that they have a hard time using it in offline measures.
• This seems to show that children are still developing this ability, and although it already plays a role, it’s not strong enough to be explicitly used.
Next Steps

• Compare TD children with ASD children.
• Training effects:
  - Can performance be improved by training?
Thank you very much!

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