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This research project is aimed at providing individualised intervention for reading and comprehension for students with Autism spectral disorder (ASD) and intellectual disability (ID) (> 6 y) using an online computer based reading program called Headsprout® early reading (HER) program. The intervention is adapted to each learner's pace and ability. The study is directed for students with minimal reading skills attending special schools or being home tutored. Behaviour analysis is applied to facilitate the learning of the participants using a single system research design, enabling individualised intervention with a training package for teachers, parents and therapists for the use of adaptive technology.

### Reading skills

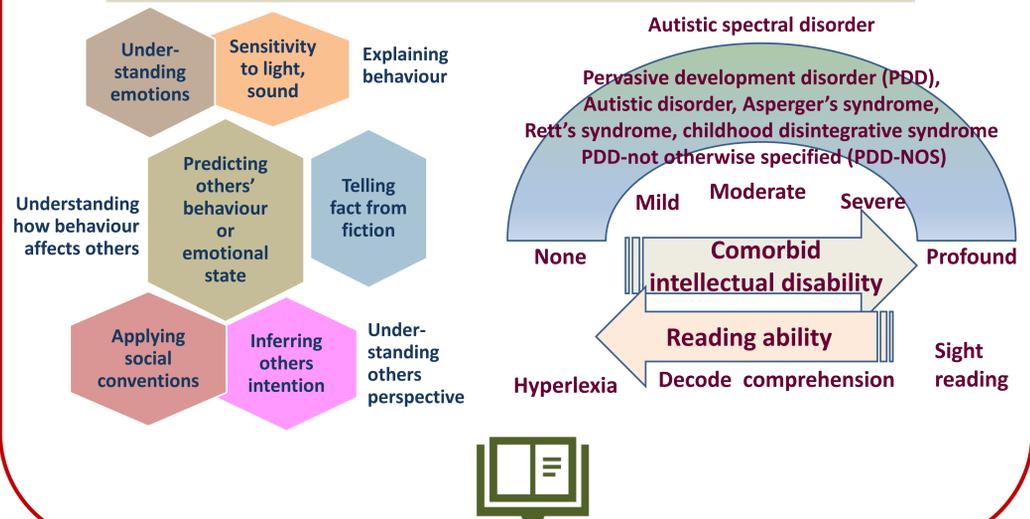
- Reading encompasses a subset of skills: phonics, phonemic awareness, vocabulary development, fluency, and comprehension.
- National reading panel (1) and research (2,3) suggests that it is necessary to teaching reading in all these target areas
- Teaching methods based on the alphabetic principle and phonemes are more effective to becoming proficient in the skill of reading. More so for children at risk or having difficulty with reading

- 1) National reading panel, U.S. (2000)
- 2) Twyman (2009)
- 3) Rayner et al (2001)



<http://margdteachingposters.weebly.com/comprehension.html>

### Autistic spectral disorder (ASD) and impact on reading skills



### Headsprout® is a commercially available online program

- ABA-based software
- Systematic, online interactive lessons
- Comprises of up to 80 lessons of early reading program and further 40 lessons in reading comprehension program
- Student progresses to next step once the mastery criteria for reading as well as comprehension skills are met at each step
- Online data collection facility for each student
- Parallel books and off computer, generalisation activity packs available

[www.headsprout.com](http://www.headsprout.com)

### HER lessons target all reading areas



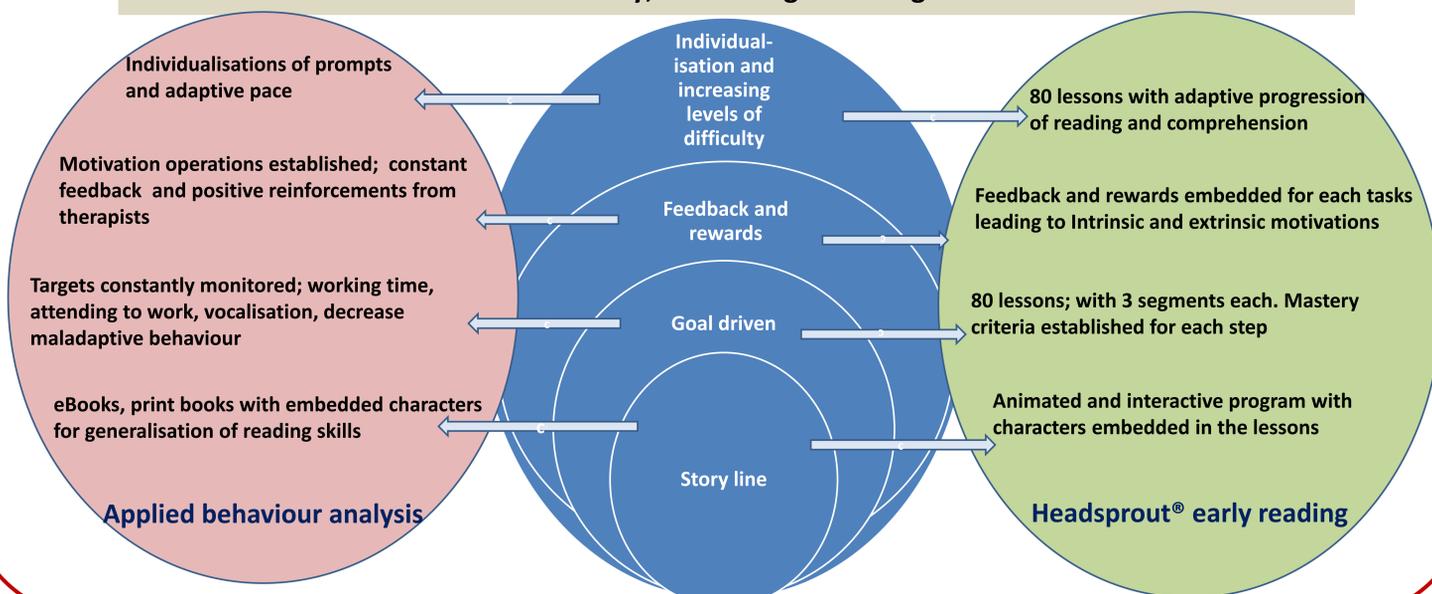
1 → → → → → → → → 80

HER lessons

### Intervention strategies

- Touchscreen device**
  - Headsprout® early reading (HER) using the website login on a touch screen computer
  - HER is now available as an app on iOS and tablet devices- app: kids a-z
- Baseline levels**
  - Reading assessment; Dynamic indicators for early literacy (DIBELS)
  - Nonverbal students will be assessed using the Non-verbal literacy assessment (NVLA) developed by Alghrim-Delzell et al University of North Carolina
  - HER assessment for placement on the program
- Individualisation**
  - Shaping of learning behaviour, duration of the ability to work on the device, attention, maladaptive behavior, read aloud, reading skills subsets, comprehension
  - Feedback in term of tokens, social praise, to provide motivation
  - Additional learning material using cards and pictures to teach the concepts required for HER lessons, eg negation, memory
  - Monitored 1:1 by therapist/teacher
- Progress monitoring**
  - Online monitoring
  - HER data collection
  - Administer the reading assessment at 0, 3, 6, 9 months to monitor reading gains in the NRP recommended areas in comparison to the baseline levels

### iCANRead-Inclusive program for comprehension and reading using behaviour technology and an interactive program with touchscreen gadgets for individuals with autism and intellectual disability; A serious game design



### Ongoing work and plans

- Develop a learning plan for each student
- Train the school teacher, so that the program can be delivered 3-4 times a week
- Researcher direct input will be faded
- Aim to promote independence where possible
- Generalisation to read print and eBooks.
- Eye gaze and/or speech generation device for non-verbal students

### Acknowledgments

Participants, caregivers, teachers, school authorities

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