Prediction of Communication Risk Before 12 months with the ISCBS: Group Outcomes at 3 Years

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Background

- Most current assessments measure early communication beginning around 9-12 months, and very little is known about early signs of atypical development prior to this age group.
- The amount of communicative interaction an infant engages in (i.e., vocal reappraisal, rate of joint attention, rate of communication, and parental response contiguity) correlates to receptive and expressive language at 30-36 months of age (Brady et al., 2004; McCartney et al., 1999; Schuyer et al., 2011).
- Poorer use of social-communicative behaviors (i.e., pointing and warning/nodding, gesture use, joint attention, shared enjoyment, gazing/sharing, gaze/point following, requesting attention) and oral/manual motor skills at 12 months have been associated with later autism diagnosis (Gernsbacher et al., 2007; Venes et al., 2012).

Research Questions

- Does the ISCBS discriminate infants between 2-8 months who later demonstrate communication impairments (at 3 years) from those who do not?
- Which ISCBS communication behaviors and/or domains distinguish infants with communication risk from preterm infants with typical development?

Participants

106 infants at 2-12 months (mean = 6.63 months, s.d. 3.5) – 58 with no known risk factors at birth, 5 premature, 2 with severe physical impairments, and 1 with deafness and cochlear implant at 18 months.

By age 3, 61 children were within typical limits with no clinically significant risk, including 3 of the premature infants.

Out of 106 children, 27 had the following diagnosed disabilities: 10 had language and/or speech disorders, 7 had ASD, 5 had behavioral disorders, 3 had physical/sensory processing disorders, and 2 had complex communication needs/LAC.

An additional 18 children had low MLUs at 1 s.d. below age expectations with no specific diagnosis.

Procedure

- Infant – Administration at home: 18 different ISCBS social, toy, and communicative templates, and the Battelle Developmental Inventory
- Goldstein Test of Articulation-2/Whan-Lewis Phonological Assessment-2
- Vineland Adaptive Behavior Scale
- Autism Diagnostic Observation Schedule, Second Edition (ADOS-2)
- Language samples with parent and experimenter, including SAQ analysis
- Follow-up at 3 years – Administration at home of:
  - Mullen Developmental Scales
  - Clinical Evaluation of Language Fundamentals, Preschool (CELF-P)
  - Frisbie Test of Articulation-2/Whan-Lewis Phonological Assessment-2
  - Vineland Adaptive Behavior Scale
  - Autism Diagnostic Observation Schedule, Second Edition (ADOS-2)

Group Results & Discussion

An ANOVA analysis shows significant post hoc comparisons with combined categories for the following disorders:
- Physical/sensory disorders and behavioral disorders (PSBHE)
- Speech/language disorders and low MLU (S/LMU).

Additional ISCBS variables of interest were derived from significant t tests between target groups.

1. Subgroup Differences: Children with Autism (n=7)

- ANOVA: Less vocalizing than children with speech/language issues
- ANOVA: More negative affect directed to objects than TD or PSBEH groups
- ANOVA: Less positive affect toward objects than TD or S/LMU groups

2. Subgroup Differences: Children with S/L disorder (n=10) and/or Low MLU (n=15)

- ANOVA: More vocalising in S/L or S/LMU than TD or S/L disorder groups
- ANOVA: Less vocalizing than children with speech/language issues
- ANOVA: Less imitation of play action than TD
- ANOVA: Less functional play, symbolic play, or object permanence than TD

3. Subgroup differences: Children with Physical/Sensory (n=3) or Behavioral Disorders (n=5) or combined (PSBHE)

- ANOVA: Less vocalizing than children with speech/language issues
- ANOVA: More negative affect directed to objects than TD and PSBEH groups
- ANOVA: Better response to “where’s mom/dad” than TD or S/LMU groups

Impact for Children with ASD:

- Children with ASD showed poorer amount and quality of vocalizations as well as attention to others’ vocalizations, consistent with other research patterns before 12 months. Vocal patterns were notably worse than children with speech/language impairments, and may discriminate these groups at early ages.
- Significant reciprocity difficulties were seen in gesture, vocal, and play action imitation as well as taking any turns in interaction, showing a consistent pattern with that shown in later childhood.
- Emotional concerns were shown in less positive affect toward people or objects and more negative affect toward objects, but gaze behaviors themselves were not impaired in most contexts. A combination of gaze and intent factors may distinguish infants at risk for ASD.
- Most early play schemes were within typical limits (e.g., banging), but poor targeted play may reflect early fine and/or gross motor limits often associated with infants with ASD.
- Limited visual tracking, object permanence, and gesture types may reflect a combination of language, cognitive, and social issues affecting early behavior of infants with ASD.

Impact for Children with S/L Disorders or Risk:

- Infants with speech/language disorders or risk may make frequent use of vocalizations to elicit listeners socially and compensate for less access to gestural communication.
- Infants with S/L disorders may take advantage of person and object information within interactions using gaze shifts.
- Impaired skills in functional/symbolic play, object permanence, or play imitation may reflect general symbolic delays in children’s development associated with language impairment.

Clinical Implications

- These pilot results with only 5-6 infants per disability group (ASD and S/L) show promising indications of identification of communication risk in infants, consistent with characteristics associated with older children who have those disorders; ongoing research includes 3 larger norming cohorts of 100 infants each, which should provide more definitive risk factors.
- Children who had no diagnosed disability but low productive MLU scores showed significant differences in some infant skills from TD peers, and looked more like children with LI.
- Pilot results suggest that identification of risk factors is best determined separately in infants with different outcomes; risks may be differentiating for all children with disabilities together.
- It is possible to gain useful information about communication risk from children younger than 6-8 months using the ISCBS standardized play-based communication assessment.

References


ISCBS Collaborators

- Brooks Publishing Co.
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