

Red Flags of Autism Spectrum Disorders in the Second Year

Implications for Improving Early Identification

International Meeting for Autism Research
Sacramento, CA
May 6, 2004

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Can ASD be detected earlier?

- ❖ ASD can be diagnosed reliably by experienced professionals down to 2 years of age.
 - *Social Impairments* and *Communication Impairments* were prominent at 2 years of age.
 - *Restricted Repertoire of Activities and Interests* were not prominent in some children until 3 years of age
(Lord, 1995; Stone, Lee, Ashford, Brissie, Hepburn, Coonrod, & Weiss, 1999)
- ❖ Social communication impairments should be evident in very young children since they involve abilities that typically develop in the first two years of life
- ❖ Studies of home videotapes show that social communication features distinguish infants later diagnosed with ASD
 - Lack of pointing, showing, looking at others, orienting to name
(Osterling & Dawson, 1994; 1999)

The purpose of this prospective, longitudinal study was to identify precise early indicators of autism spectrum disorders (ASD) during the second year of life.



METHOD

Children were recruited from the FIRST WORDS Project

Project Collaborators

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Funding

US DOE

Office of Special Education Programs
Institute of Education Sciences



FIRST WORDS Project

Model Demonstration and
Research Project
Funded by US DOE

firstwords.fsu.edu

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METHOD

Children were recruited from the FIRST WORDS Project

- ➔ Step One: Brief Parent Report
 - Complete the CSBS DP Infant-Toddler Checklist
 - Includes 24 items about developmental milestones and a question about whether the parent is concerned about the child's development
- ➔ Step Two: Interactive Child Evaluation
 - Videotape the CSBS DP Behavior Sample
 - Includes a sequence of 6 communication and play opportunities while interacting with the caregiver and clinician, which becomes an archival record

Prospective Study of ASD

Prospective Longitudinal Sample

- ❖ 3,021 completed a CSBS DP Infant Toddler Checklist between 12 and 24 months
- ❖ 350 were videotaped during a Behavior Sample of child's communication and play

Three Groups of 18 Children

ASD Group: children later diagnosed with ASD
 DD Group: children with developmental delay in which ASD was ruled out
 TD Group: children with typical development

Participant Characteristics

| | ASD | DD | TD |
|----------------------|-------------|-------------|-------------|
| Sample Size | 18 | 18 | 18 |
| CSBS DP Age | 21.0 months | 18.4 months | 20.3 months |
| BS Total SS | 69.3 (4.79) | 75.2 (10.6) | 102.0 (9.4) |
| Follow-up Age | 35.9 months | 30.5 months | 33.2 months |
| Mullen V DQ | 61.4 (32.2) | 77.1 (23.8) | 100.4 (9.4) |
| Mullen NV DQ | 78.0 (21.2) | 80.3 (20.1) | 104.9 (9.8) |
| NV DQ >80 | 9 | 9 | 18 |

Systematic Observation of Red Flags (SORF) for ASD in Young Children (Wetherby & Woods, 2002)

| | |
|---|------------|
| ❖ Reciprocal Social Interaction | (8 items) |
| ❖ Unconventional Gestures | (3 items) |
| ❖ Unconventional Sounds and Words | (6 items) |
| ❖ Repetitive Behaviors and Restricted Interests | (5 items) |
| ❖ Emotional Regulation | (7 items) |
| | (29 items) |

Interrater Reliability on SORF

- ❖ Percent agreement: 97.1%
 - 89.7 to 100% across children
 - 83.0 to 100% across items
- ❖ Cohen's Kappas: .94
 - .82 to 1.00 across children

Red Flags of Autism Spectrum Disorders and Developmental Delays in the Second Year of Life

ASD Red Flags

- Lack of showing
- Lack of coordination of nonverbal communication
- Lack of sharing interest or enjoyment
- Repetitive movements with objects
- Lack of appropriate gaze
- Lack of response to name
- Lack of warm, joyful expressions
- Unusual prosody
- Repetitive movements or posturing of body



ASD & DD Red Flags

- Lack of pointing
- Lack of playing with a variety of toys
- Lack of response to contextual cues
- Lack of communicative vocalizations with consonants

Wetherby and Woods (2003)

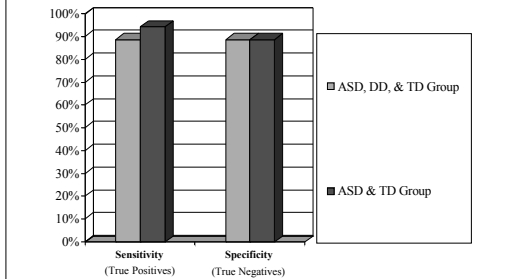




Subjects Classified Correctly from Discriminant Analysis using 13 Red Flags

| Actual Group Membership | Predicted Group Membership | | |
|-------------------------|----------------------------|----------|-----------|
| | ASD | DD | TD |
| ASD | 18 (100%) | 0 (0%) | 0 (0%) |
| DD | 0 (0%) | 15 (83%) | 3 (17%) |
| TD | 0 (0%) | 0 (0%) | 18 (100%) |

Agreement of Classification of the Infant-Toddler Checklist and Diagnosis



ASD Group Characteristics

| | Original Group | Larger Group |
|---------------|----------------|--------------|
| Sample Size | 18 | 30 |
| CSBS DP Age | 21.0 months | 20.0 months |
| BS Total SS | 69.3 (4.79) | 70.9 (7.2) |
| Follow-up Age | 35.9 months | 35.9 months |
| Mullen V DQ | 61.4 (32.2) | 65.8 (34.5) |
| Mullen NV DQ | 78.0 (21.2) | 80.3 (27.2) |
| NV DQ >80 | 9/18 | 15/30 |

ASD Group SORF Scores

| SORF | Original Group (n=18) | Larger Group (n=30) |
|------------|-----------------------|---------------------|
| Age | 21.0 months | 20.0 months |
| Total (29) | 22.9 (8.5) | 22.7 (7.8) |
| RSI (8) | 10.2 (2.5) | 9.9 (2.6) |
| UG (3) | 3.7 (1.0) | 3.6 (1.1) |
| US (6) | 2.8 (2.2) | 2.8 (2.0) |
| RBRI (5) | 4.0 (2.5) | 4.2 (2.3) |
| ER (7) | 2.2 (2.4) | 2.3 (2.1) |

Percentage of Original (n=18) and Larger (n=30) ASD Group showing the 13 Red Flags

| SORF Items | n=18 | n=30 |
|---|------|------|
| RSI 2. Lack of appropriate gaze | 72% | 80% |
| RSI 3. Lack of warm, joyful expressions | 83% | 87% |
| RSI 4. Lack of sharing interest or enjoyment | 94% | 97% |
| RSI 6. Lack of response to contextual cues | 89% | 87% |
| RSI 7. Lack of response to name | 100% | 100% |
| RSI 8. Lack of coordination of nonverbal communication | 100% | 97% |
| UG 2. Lack of pointing | 94% | 93% |
| UG 3. Lack of showing | 100% | 97% |
| US 3. Unusual prosody | 50% | 47% |
| US 6. Lack of communicative vocalizations with consonants | 83% | 87% |
| RBRI 1. Repetitive movements or posturing of body | 50% | 60% |
| RBRI 2. Repetitive movements with objects | 72% | 77% |
| RBRI 5. Lack of playing with a variety of toys | 83% | 77% |

Early Social Interaction Project

Model Demonstration Project
 funded by the U.S. DOE

Amy Wetherby & Juliann Woods
 Project Co-Directors

<http://esi.fsu.edu>

MATERIALS: Critical Information for Parents of
 Young Children with Social Communication Delays

CONCLUSIONS

- ❖ Children with ASD in the second year of life can be distinguished from those with DD and TD through systematic observation.
- ❖ The combination of 1st stage screening for delay and 2nd stage screening for ASD is accurate for early identification.
- ❖ The 13 red flags identified in this study include a combination of lack of typical behaviors and presence of atypical behaviors and contribute to the delineation of early indicators of ASD.

Systematic Observation of Red Flags for Autism Spectrum Disorders in Young Children

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Difficulty with Reciprocal Social Interaction (RSI)

1. Aversion to social touch or proximity
- *2. Lack of appropriate gaze
- *3. Lack of warm, joyful expressions with directed gaze
- *4. Lack of sharing interest or enjoyment
5. Lack of anticipatory posture or movement in response to interaction
- **6. Lack of response to contextual cues
- *7. Lack of response to name when called
- *8. Lack of coordination of gaze, facial expression, gestures, and sounds

Unconventional Gestures (UG)

1. Using person's hand as a tool without directed gaze
- **2. Lack of pointing
- *3. Lack of showing

Unconventional Sounds and Words (US)

1. Atypical vocalizations (squeals, growls, and yells)
2. Unusual syllable strings
- *3. Unusual prosody (little variation in pitch, odd intonation, irregular rhythm, unusual voice quality)
4. Immediate echolalia
5. Idiosyncratic or repetitive use of words or phrases
- **6. Lack of communicative vocalizations with consonants

Repetitive Behaviors and Restricted Interests (RBRI)

- *1. Repetitive movements or posturing of body, arms, hands, or fingers
- *2. Repetitive movements with objects
3. Unusual sensory interest or exploration with objects
4. Excessive interest in or focus on particular toys
- **5. Lack of playing with toys and objects conventionally

Emotional Regulation (ER)

1. Fear or distress about particular objects
2. Distress over removing particular objects
3. Difficulty calming when distressed
4. Abrupt shifts in emotional or behavioral state
5. Heightened alertness and response to stimuli or situations
6. Flat affect or unresponsive to interactions
7. Challenging behavior (self-injury or aggression)

* differentiated children in ASD group from DD and TD groups (n=18 in each group) in the second year of life

** differentiated children in ASD and DD groups from TD group in the second year of life