

Relationship Among Early Red Flags for Autism Spectrum Disorders Disorders in the Second Year of Life and Later Symptoms.

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Introduction

- ❖ Autism spectrum disorders (ASD) are characterized by three core diagnostic domains according to the DSM IV (APA, 1994).
- ❖ The pattern of relations among these core domains has important theoretical implications regarding the development of autism.
- ❖ Symptoms include deficits in typical skills and presence of atypical skills which can be reliably observed in preschool on instruments such as the ADOS (Lord et al., 2000; 2002)
- ❖ Advances in early identification in very young children has shown that symptoms of ASD can be directly observed in the first two years of life using retrospective home video studies (Osterling & Dawson, 1994; Osterling, Dawson & Munson, 2002; Baranek, 1999) and prospective longitudinal studies (Charman et al., 1997; Wetherby et al., 2004)
- ❖ The Systematic Observation of Red Flags (SORF) was developed to directly observe symptoms in all three domains in very young children at risk for ASD. (Wetherby & Woods, 2002).

Prospective Study in the Second Year of Life on Red Flags of ASD using SORF (n=18)

13 Red Flags for ASD

Reciprocal Social Interaction (RSI)

- ☐ Lack of appropriate gaze
- ☐ Lack of warm, joyful expressions
- ☐ Lack of sharing interest or enjoyment
- ☐ Lack of response to contextual cues
- ☐ Lack of response to name
- ☐ Lack of coordination of nonverbal communication

Repetitive Behaviors & Restricted Interests (RBRI)

- ☐ Repetitive movements with objects
- ☐ Repetitive movements or posturing of body
- ☐ Lack of playing with a variety of toys

Communication (COM)

- ☐ Unusual prosody
- ☐ Lack of showing
- ☐ Lack of pointing
- ☐ Lack of communicative vocalizations with consonants

(Wetherby, Woods, Allen, Cleary, Dickinson, & Lord, 2004)

Method

- ❖ Participants drawn from a pool of over 5,000 children screened through the FIRST WORDS Project
- ❖ Participant selection criteria:
 - Archival videotaped Behavior Samples were available from their 2nd year of life
 - Follow-up diagnostic and developmental assessment included administration of the ADOS
 - Diagnosed with ASD after three years of age
- ❖ Behavior Sample videotapes were coded using the SORF
 - Interrater Reliability: Cohen's Kappas > .80

Participants (N = 34)

- ❖ Chronological Age at Behavior Sample / SORF
Mean Age: 21.73 months (SD 1.92)
- ❖ Chronological Age at ADOS assessment
Mean Age: 44.92 months (SD 12.59)
Diagnoses: Autism n=17; ASD n=17
- ❖ Developmental indicators
Mullen NV DQ: 81.94 (SD 26.59)
Mullen V DQ: 73.58 (SD 32.46)
Vineland ABC: 72.09 (15.04)
- ❖ Gender 82% male

Mean scores & proportion of children showing symptoms on SORF and ADOS (N=34)

SORF Categories (21.73 months)	Mean	SD	%>0
Reciprocal Social Interaction (RSI)	8.15	3.31	100%
Communication (COM)	6.03	2.78	97%
Repetitive Behaviors/Restricted Interests (RBRI)	3.38	2.17	94%
ADOS Categories (44.92 months)			
Reciprocal Social Interaction	8.76	2.72	100%
Communication (COM)	5.24	2.02	100%
Stereotyped Behavior & Restricted Interests (SBRI)	1.85	1.74	77%

SORF RSI items	Mean	SD	%>0
Aversion to touch	0.00	0.00	0%
Lack of appropriate gaze*	1.29	0.91	71%
Lack of warm, joyful expressions with gaze*	1.12	0.77	76%
Lack of sharing enjoyment or interest*	1.56	0.66	91%
Lack of anticipatory posture	0.21	0.54	15%
Lack of response to contextual cues	0.79	0.81	56%
Lack of response to name*	1.76	0.50	97%
Lack of coordination of gaze, gesture, sounds and facial expression*	1.41	0.78	82%

* One of the original 13 red flags for ASD

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SORF COM items	Mean	SD	%>0
Using a person's hand as a tool	0.15	0.36	15%
Lack of pointing	1.53	0.75	85%
Lack of showing*	1.65	0.69	88%
Atypical vocalizations	0.21	0.48	18%
Unusual syllable strings	0.21	0.54	15%
Unusual prosody*	0.88	0.95	50%
Immediate echolalia	0.09	0.38	6%
Idiosyncratic or repetitive use of words	0.15	0.50	9%
Lack of vocalizations with consonants	1.18	0.83	73%

* One of the original 13 red flags for ASD

SORF RBRI items	Mean	SD	%>0
Repetitive movements or posturing of body, arms, hands, or fingers*	0.71	0.84	47%
Repetitive movements with objects*	0.94	0.85	62%
Unusual sensory exploration of objects	0.35	0.65	26%
Excessive interest in particular toys	0.53	0.62	47%
Lack of playing with a variety of toys	0.91	0.87	59%

* One of the original 13 red flags for ASD

Concurrent correlations among SORF and ADOS domains

	Communication	RBRI/SBRI
SORF in the 2nd year		
RSI	.69*	.62*
Communication		.53*
ADOS in the 4th year		
RSI	.77*	.45[†]
Communication		.38

*p<.0014 (Bonferroni correction); [†]nonsignificant trend p<.01

Predictive correlations among SORF & ADOS scores (N=34)

SORF	ADOS		
	RSI	COM	SBRI
RSI	.42	.50[†]	.58*
COM	.31	.39	.35
RBRI	.39	.50[†]	.67*

*p<.0014 (Bonferroni correction); [†]nonsignificant trend p<.01

Predictive correlations among SORF and developmental outcome measures

SORF	Mullen		Vineland
	NVQ	VQ	ABC
RSI	-.43	-.48[†]	-.25
COM	-.25	-.24	-.25
RBRI	-.56*	-.45[†]	-.23

*p<.0014 (Bonferroni correction); [†]nonsignificant trend p<.01

Conclusions

- ❖ Symptoms in all three core diagnostic domains were observed in a majority of children with ASD under two years of age.
- ❖ Symptoms across all three domains were highly correlated in the second year, while in the fourth year RSI and COM only were significantly correlated.
- ❖ Predictive relations suggest greater consistency in repetitive and stereotyped behaviors over time than for symptoms in RSI and COM, as well as reciprocal effects on symptoms across domains.
- ❖ The SORF and ADOS detect symptoms that are highly diagnostic of ASD across the range of developmental functioning, and these do not predict adaptive behavior outcomes.