

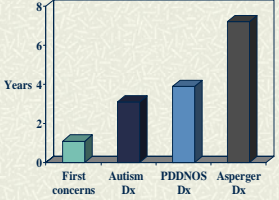
Autism in Infancy: Can We Detect It Earlier?



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Rationale

- ⚡ Mean age of diagnosis = 34 – 61 months
- ⚡ Mean age of first parental concern = 18 – 19 months
 - 30–50% report concerns before 1st birthday
- ⚡ Earlier identification → earlier intervention



Autism Diagnosis Age 2 – 3


- ⚡ Impairments in
 - Social interest & engagement
 - Joint attention
 - Imitation
 - Pretense
 - Speech
 - Gestural communication
 - Emotional responsivity
- ⚡ Diagnosis by experienced clinicians reliable and stable
 - Better for autism than PDDNOS
 - 80 – 90% with autism stay on spectrum

Autism Before Age 2

	Retrospective Studies, Age 1 – 2 (n=8)	Prospective Studies, Age 1 – 2 (n=4)	Before First Birthday
Response to name	✓	✓	?
Looking at faces / Gaze	✓	✓	?
Joint attention	✓	✓	?
Shared affect	✓	✓	?
Stereotyped behaviors	?		?
Regulatory / Temperament	?	✓	?


UC Davis – UCLA Infant Sibling Study: Study Goals

- ⚡ Early identification
 - How early can we diagnose accurately?
 - What markers are predictive?
- ⚡ Familial difficulties broader than autism
 - What is transmitted in families?
 - Who needs treatment?



Sample

- ⚡ 218 siblings of children with autism (52% male)
- ⚡ 127 siblings of children with typical development (56% male)
- ⚡ Ages tested
 - n=218 at 6 months (63%)
 - n=244 at 12 months
 - n=209 at 18 months
 - n=119 at 24 months
 - n=59 at 36 months
- ⚡ Longitudinal data
 - n=51 recruited by 6-months and seen at 24+ months (15%)
 - n=119 with 24-month or later “outcome” data (34%)



Measures

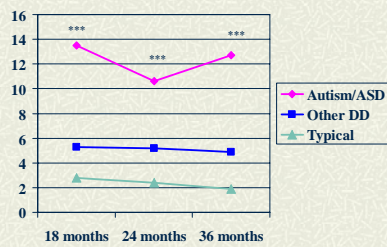
Communication	ESCS, Mullen, MacArthur CDI, Language Use Inventory, language discrimination
Social-Emotional	Peek-a-boo, imitation, emotion contagion, symbolic play, social skills ratings
Face Processing	Eye gaze during still face paradigm & while viewing emotion expressions
Autism Symptoms	ADOS, ADI, Childhood Routines Inventory, Social Responsiveness Scale
Other	Mullen, Vineland, motor, head circumference, object processing, smooth pursuit, attention shifting

Developmental Outcomes at 24 months

	123 At-Risk Sibs	55 Control Sibs
Autism/ASD	13 11%	1 2%
Other delays	34 28%	4 7%
No dev problems	76 61%	50 91%
Total affected	47 39%	5 9%

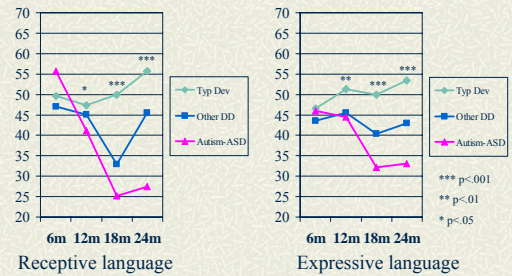
Symptoms of Autism by Outcome Group

Autism Diagnostic Observation Scale (ADOS)

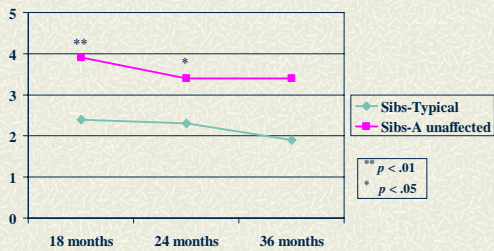


Language Trajectories by Outcome Group

Mullen Scales of Early Learning

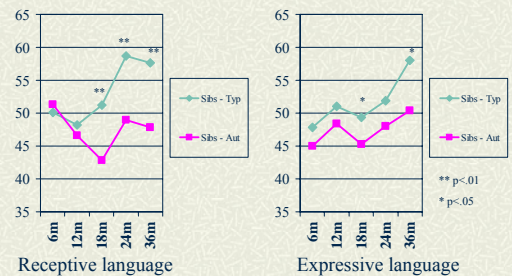


Symptoms of Autism by Sibling Group



Language Trajectories by Sibling Group

Mullen Scales of Early Learning



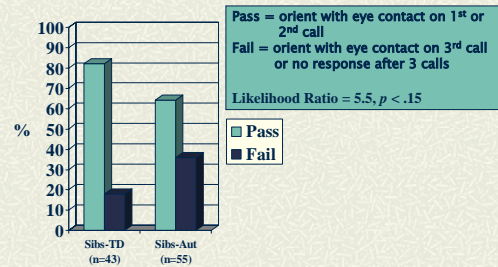
Diagnostic Predictiveness of 12-month Response to Name

	Autism/ASD	Other DD	Typical
Fail	5	6	3
Pass	4	22	86

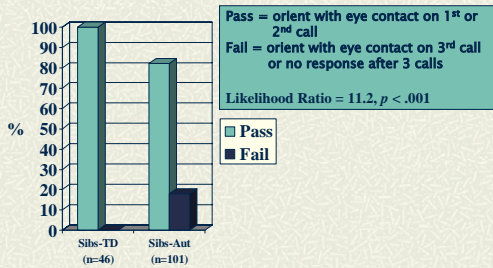
Autism/ASD outcomes: Se = .56 Sp = .92

Any DD outcomes: Se = .36 Sp = .97

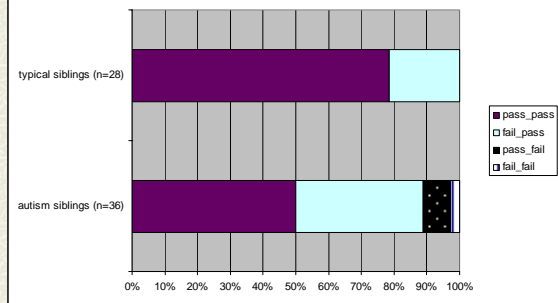
Response to Name @ 6 Months by Sibling Group



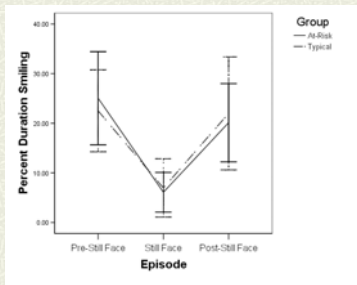
Response to Name @ 12 Months by Sibling Group



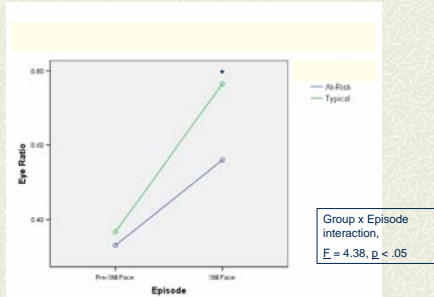
Consistency between Response to Name at 6 and 12 month visits



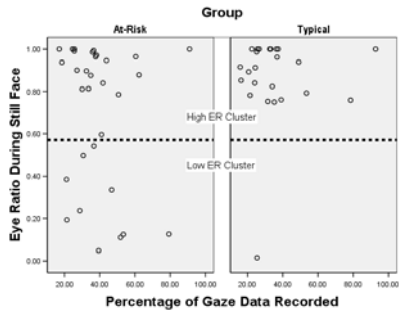
Affect During Still Face @ 6 Months



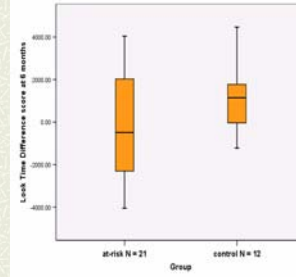
Gaze to Eyes v. Mouth by Sibling Group



Distribution of Eye Ratio by Sibling Group

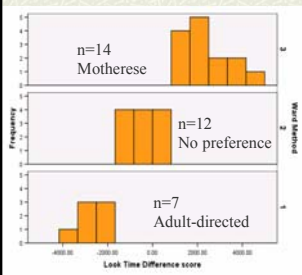


Lack of Preference for “Motherese” at 6 months



- ❑ Motherese characterized by high pitched exaggerated speech with positive affect
- ❑ Function to enhance phoneme discrimination and language learning
- ❑ Preferred by most typically developing infants
- ❑ Infants with older sibs with autism do not prefer motherese

Adult-Directed Speech Preference



	High risk	Low risk
Motherese	6	8
Adult directed	7	0

$\chi^2 = 6.5, p = .01$

Canadian Infant Sibling Study: Autism Observation Scale for Infants (AOSI)

Eye contact
Visual tracking
Disengagement of attention
Response to name
Imitation
Social smiling
Reactivity and sensory interest
Social interest

6 Month Identifiers of Autism (Zwaigenbaum et al., 2005)

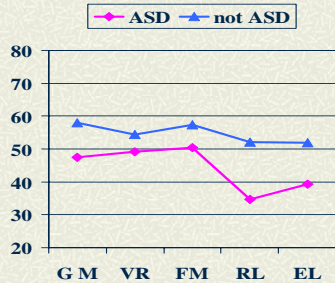
N = 44 infant sibs 15 typical controls	
AOSI specific behaviors	No differences
AOSI number of autism markers	No differences
Temperament	No differences
Mullen developmental scores	No differences

“Our current behavioral data do not support predictions of later diagnosis based on observations at 6 months”

12 Month Identifiers of Autism (Zwaigenbaum et al., 2005)

AOSI - autism risk score of 7+	Identified 6 of 7 who later develop autism
Visual disengagement	Decrease in attention shifting from 6 to 12 months
Mullen language	Significantly lower
Temperament	More frequent and intense distress; longer duration of attention

Baltimore Infant Sibling Study: 6 Month Developmental Scores



Mullen Scales: no significant differences

Study Goals

- ✦ Early identification
 - How early can we diagnose accurately?
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- ✦ Familial difficulties broader than autism



Infant Sibling Research Design Identifies Autism Earlier

Clinical Best Estimate by Expert Rater

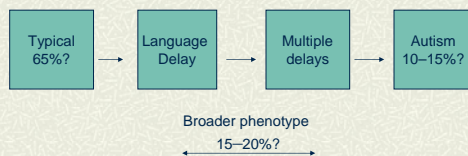
	6 mos	12 mos	18 mos	24 mos	36 mos
1	Yellow	Red	Red	Red	Red
2	Yellow	Red	Red	Red	Red
3	Green	Yellow	Red	Red	Red
4	Green	Yellow	Red	Red	Red
5	Green	Yellow	Red	Red	Red
6	Green	Yellow	Red	Red	Red
7	Green	Yellow	Red	Red	Red
8	Black	Green	Yellow	Red	Red
9	Black	Green	Yellow	Red	Red
10	Black	Yellow	Red	Red	Red
11	Black	Yellow	Red	Red	Red
12	Black	Yellow	Red	Red	Red
13	Black	Yellow	Red	Red	Red
14	Black	Yellow	Red	Red	Red

But no 6 month markers predictive...

Difficulties Broader than Autism In Siblings

- ✦ Social-communication delays (slightly elevated ADOS scores)
- ✦ Language delays
- ✦ Response to name
- ✦ Gaze to eyes

Continuum of Affectedness



Emergence of Autism

- No differences in developmental scores or behavioral presentation at 6 months for those who develop autism
- Diminishing dyadic engagement and eye contact over 9 to 15 month period
- Failure to develop joint attention behaviors between 9 and 15 months
- Diminished vocalization, slowing of receptive & expressive language development rates
- Onset of unusual patterns of looking, object manipulation in some by 12 months
- Onset pattern does not meet traditional definitions of regression in any of our subjects

Unusual and Unexpected Patterns

- ❖ At 18 months, social, engaged infants who show an autism profile (deficits in joint attention & imitation). Who are they?
- ❖ At 18 months, socially impaired infants who have good language, imitation, and joint attention. Who are they?
- ❖ Fluctuating symptoms across 12-30 months in some



Towards the Future: Treatment Before 18 months

- ❖ Teaching procedures for older children with autism not appropriate for infants/toddlers
- ❖ Early Start Denver Model (Rogers & Dawson)
 - Emotional mirroring
 - Face to face games
 - Communicative temptations to increase vocalizing, elicit points
 - Turn taking
 - Joint activities, shared attention
 - Giving and showing
 - Elaborated play
 - Imitate child
- ❖ Parents as cotherapists

Final Thoughts

- ❖ Global clinical judgments, standardized tests, and specific experimental constructs unable to detect autism at 6 months
- ❖ Onset patterns
 - Early onset v. Plateau
 - Regression
- ❖ Autism *emerges* over the first 2 years

