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Intensive Behavioral Intervention for Children with Autism:
A Historical Perspective

by

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I. Lovaas, Koegel, Simmons, & Stevens-Long, 1973

Participants:

- n=20
- Intake CA = 3 years to 10 years
- Independent DX = autism
- 1/2 mute, 1/2 echolalic
- minimal receptive language

Treatment:

- 12-14 months in length
- 40 hours per week
- Inpatients (n=7):
 - n=4: no parent training
 - n=3: some parent training
- Outpatients (n=13): extensive parent training

Design:

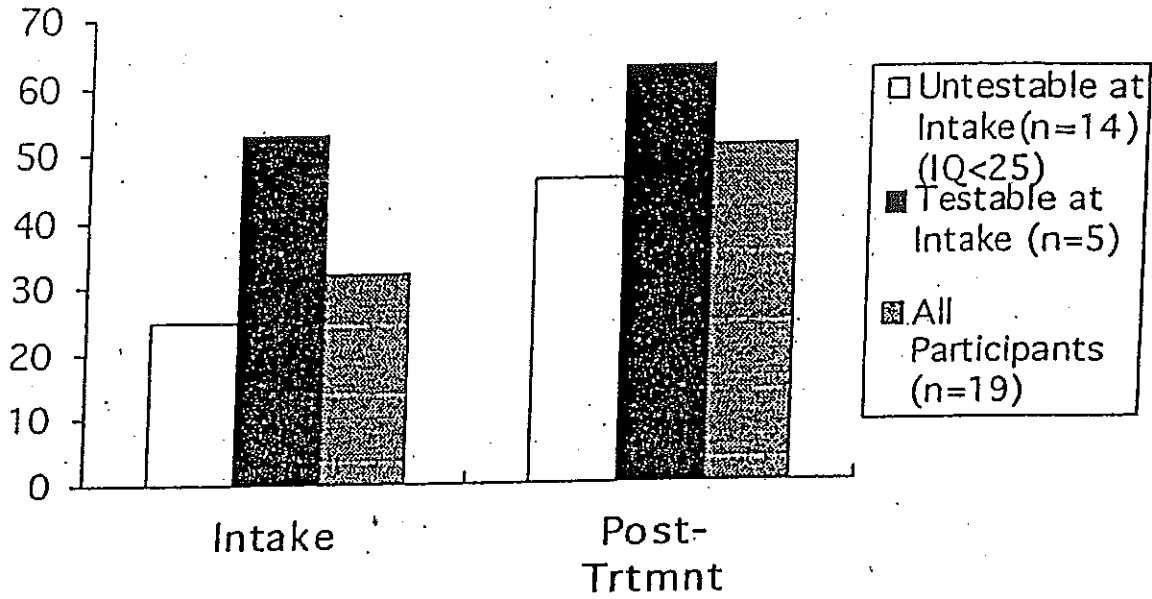
- Pre-post testing on IQ for 19 of 20 Ss
 - 18 Stanford-Binet, 1 Merrill-Palmer
- Behavior observations for 13 of 20 Ss
 - self-stimulation
 - echolalic speech
 - appropriate speech
 - social nonverbal behavior
 - appropriate play
- Data Collection for Behavior Observation
 - duration measures
 - data taken: quarterly (n=4)
 - monthly (n=3)
 - yearly (n=6)
- No control group

Results

IQ Data (n=19)

- IQ at intake: Most untestable at Intake
 - mIQ (14) = >25 (untestable)
 - mIQ (5) = 53 (range 40-80)
 - mIQ (19) = 32 (range >25-80)

• IQ at post: Most mild-to-moderate MR
mIQ(14) = 46 (range 32-70)
mIQ(5) = 63 (range 47-95)
mIQ(19) = 51 (range 32-95)



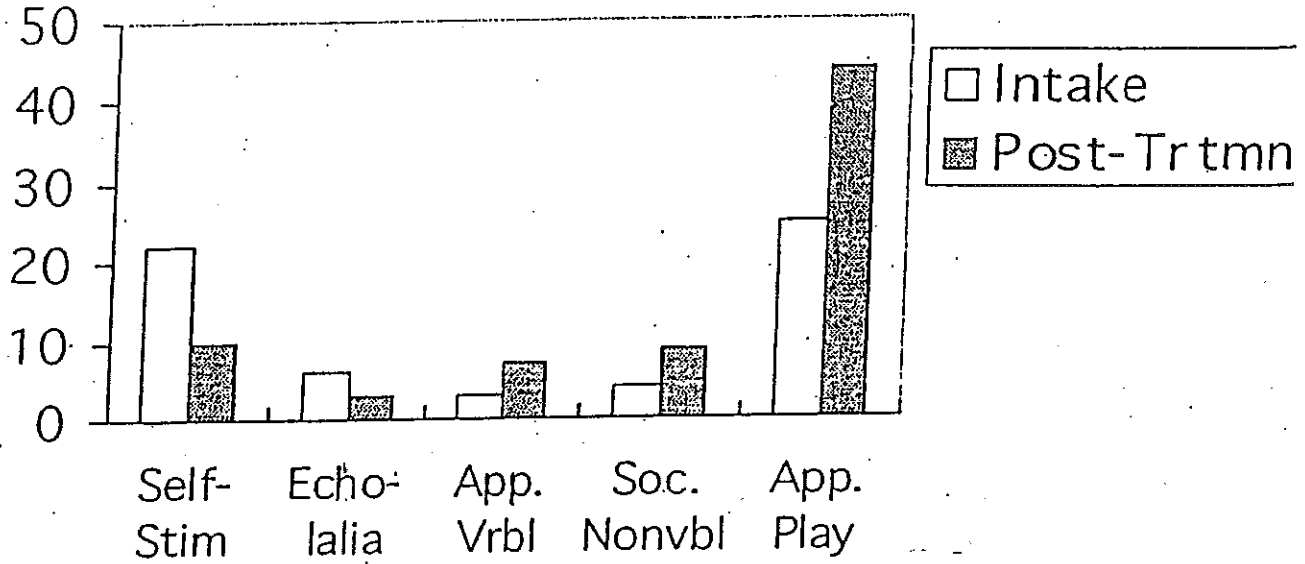
Vineland Scores (n=14)

	<u>Intake</u>	<u>Post-Treatment</u>
mean Social Quotient	48	71*

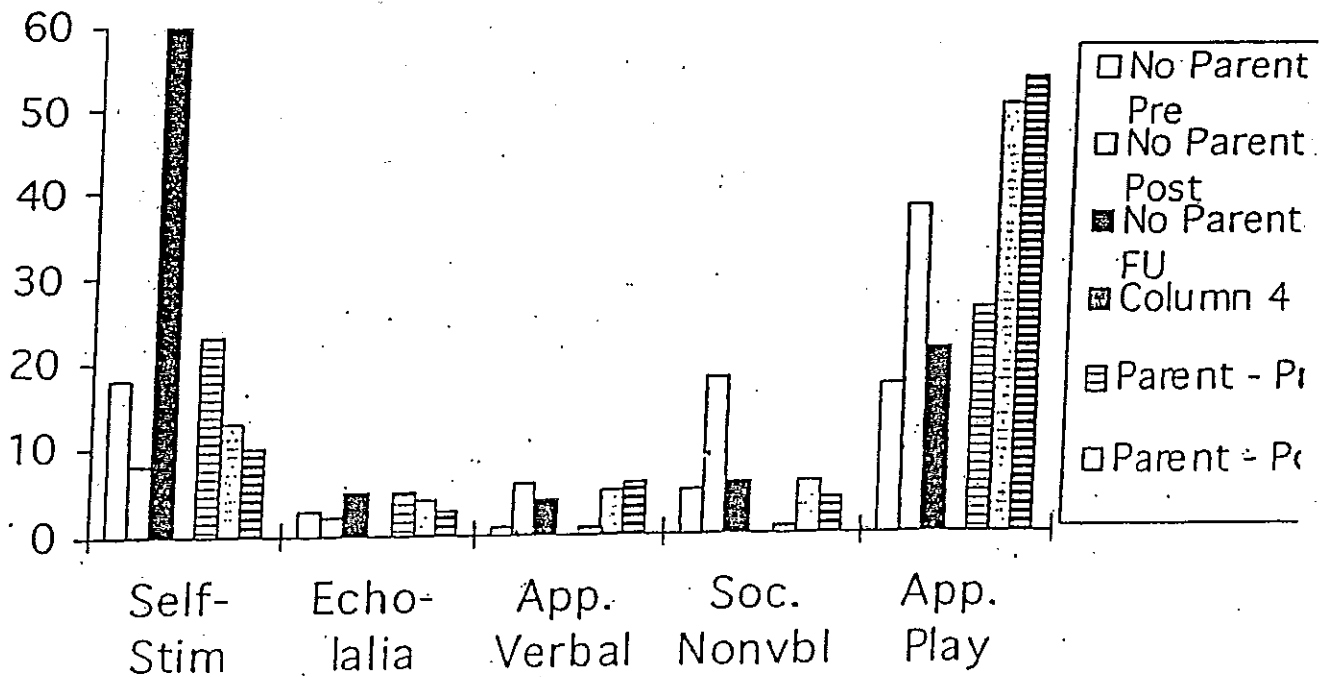
*all 14 Ss SQ scores increased

Behavior Observations (n=13)

Mean Percent Occurrence of Behavior
Pre and Post Treatment



Follow-up Data for Parent Training vs No Parent Training



Findings:

- All children improved
- Complex behaviors were acquired
- Spontaneous social interactions and language occurred
- Maladaptive behaviors decreased
- Gains were made on standardized measures
- Parent training improved learning, maintenance of skills, and continued learning
- Data was reliable

Limitations:

- Gains were limited:
 - no peer interaction was acquired
 - age-appropriate language was not achieved
- Generalization of skills taught in the hospital to other settings was limited
- Maintenance of skills not practiced in everyday life was limited
- Older children made fewer gains
- No pivotal skill was determined

II. Lovaas, 1987 (data collected from 1970 - 1983)

Participants:

Independently diagnosed with autism

CA: if mute: <40 mo
if echolalic: <46 mo

IQ > 35

Groups:

Experimental (n=19):

CA at intake: 32 months
IQ at intake: 53 (range 30-82)
35-40 hrs/wk of intervention
at least 2 yrs of intervention

Control Group 1 (n=19):

CA at intake: 35 months
IQ at intake: 46 (range 30-80)
<10 hrs/wk, plus community services
at least 2 years of intervention

Control Group 2 (n = 21):

matched on CA and IQ
not significantly different from other groups
no contact (referral control)

Assessments:

Pre-Treatment:

Independent Dx

Intelligence test

Bayley, Cattell, Gesell (Vineland)

Behavioral observations

- self-stimulatory behavior
- appropriate play behavior
- recognizable words

Parent interview

- recognizable words
- toy play
- emotional attachment
- appearance of sensory deficits
- peer play
- self-stimulatory behavior
- tantrums
- toilet training
- abnormal speech (echolalia)
- age at walking
- number of siblings
- socioeconomic status
- neurological exam findings
- CA at Dx, at Treatment

Post-treatment (at age 7)

Intelligence test

WISC-R, S-B, Peabody, WPS, Bayley, Cattell, Leiter

Educational placement

Findings

- Intensive intervention allows significant improvement in intellectual and educational functioning
- Non-intensive intervention is equivalent to "community-available" interventions
- Social integration and advanced language can be taught to some children
- Results still demonstrate wide individual differences in outcome:
 - Many children reached typical functioning
 - Most children gained verbal form of communication, and reduced negative behaviors
 - Some children did not improve in global measures of functioning, although they may have acquired new skills

Limitations:

- Assignment not random, although independent of subject
- Tests should be more uniform across time and subjects
- Additional assessments of social functioning should be used
- Follow-up should be conducted
- Independent replication should be conducted

Results

IQ Change

	Pre	Post	Change
Experimental	63	83	+20
Best-outcome	70	107	+37
Control I	57	52	-5
Control II	59	58	-1

CLASSROOM PLACEMENT

Group	Regular	Aphasia	Autism/MR
Experimental			
N	9	8	2
MIQ	107	70	30
Range	94-120	56-95	(same)
Control Group 1			
N	0	8	11
MIQ	--	74	36
Range	--	30-102	20-73
Control Group 2			
N	1	10	10
MIQ	99	67	344
Range	--	49-81	35-54

III. Follow-up to Lovaas, 1987
McEachin, Smith & Lovaas, 1993

Participants:

Experimental group

n=19

CA = 13

Control I

n=18

CA = 10

Assessment:

1. All Participants:

Educational placement
Intelligence test
Vineland Adaptive Behavior Scale
Personality Inventory for Children

2. Best-Outcome Subjects:

Clinical Evaluation w/"blind" clinician
22 items, scored 0 to 3

Results

Measure	Exp	Control	Best-outcome
IQ	85	55	111
Vineland			
Communication	75	52	98
Daily Living	73	46	92
Socialization	76	50	99
Composite	72	46	94
Maladap. Beh	11	17	9
PIC			
Mean elevation	62	65	55
Mean # of scales >70	4	6	2

Best-Outcome Clinical Interview

	Mean Clinical Ratings	Range (max=66)	Ss w/ scores <10
Best-Outcome	8.8	0-42	8 of 9
Non-Clinical Comparison	1.7	0-5	9 of 9

IV. Long-Term Follow-Up (data collection begun in 1995)

Participants (from 1987 study):

- Experimental Group (n=19)
- Control I (n=19)

Assessments:

1. All participants:

- IQ (WAIS-III, WISC-III or WPPSI-R)
- Quality of Life Interview
- Aberrant Behavior Checklist
- Vineland Adaptive Behavior
- Caregiver interview/Treatment History
- Schedule for the Assessment for Psychiatric Problems in Autistic Ind. (SAPPA)
- Self-Injury Trauma Scale

2. Best-Outcome evaluation:

- Socio-Emotional Functioning (SEF)
- Wisconsin Card Sorting
- Theory of Mind Tasks
- Absurdities Scale of Stanford-Binet
- Rorschach Inkblots Test
- MMPI
- Affective Flattening Scale
- Scale for the Assessment of Thought, Language, and Communication (TLC)
- Narrative Discourse Tasks
- Social Discourse
- Abstract Semantics

Results:

Best outcome evaluation:

- Completed for 6 of 9 Ss
- Assessment completed by blind assessors
- Assessments mixed with those of non-clinical comparison group

Findings:

1. IQ: normal range maintained (mIQ = 108)
2. Absurdities of S-B: normal range
2. Wisconsin Card Sorting: superior range
3. MMPI: within normal range
4. Rorschach: no significant profile elements
5. Theory of mind tasks: evidence that they understand other's perspective
6. SEF: independent functioning, relationships with normal range

- AFS, TLC, Discourse, & Semantics measures not yet scored by independent raters.

V. UCLA Replication

VI. Multi-Site Replication of UCLA Young Autism Project (begun 1989, grant received 1995)

Purpose:

To train site directors of independent clinical centers to implement the UCLA model of intensive behavioral intervention

Method:

Site Director must:

- complete 6- to 12-month full-time internship at UCLA
- pass Quality Control measures
- continue on-site training for 2 yrs
- attend semi-annual research and clinical meetings
- receive annual site visits and pass review criteria
- achieve adequate subject recruitment

Use of cumulative replication - varied research designs across sites:

- multiple baseline
- comparison groups
- reversal design
- multiple pre-post measures
- (no control groups)

Results:

- 15 Clinical Centers are in operation, 1 to begin in Fall
- Centers are in US, Europe, and Asia

Findings:

- Two sites have 1- and 2-year data on >10 children
 - one also has comparison group data
- One site has 1- and 2-year data on >5 children
- One site has data regarding children with intake at >5 yrs old
- 6 sites have 1-year data on >5 children
- 6 sites have just begun treatment

VII. Other Early Intervention in Autism Outcome Studies

Adapted from Smith (in press) and Simeonsson, Olley, & Rosenthal, 1987

LEAP

Hoyson, Jamieson, & Strain '84

PCDI

Fenske, Zaleski, Krantz, & McClannahan, '85

May Inst.

Anderson, Avery, DiPietro, Edwards, & Christian, '87

Douglass

Harris, Handleman, Kristoff, Bass & Gordon, '90

Handleman, Harris, Celiberti, Lilleheht, & Tomchek, '91

Harris, Handleman, Gordon, Kristoff, & Fuentes, '91

Murdoch

Birnbrauer & Leach, '93

UCSF

Sheinkopf & Siegel, '98

