



Examining Moderators of an Adaptive Communication Intervention for Young Children with Autism Spectrum Disorders

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Introduction

Background

- Identifying the characteristics of children with ASD who are likely to respond to specific interventions to improve social communication and spoken language has been an important approach in early intervention research (Sherer & Schreibman, 2005; Gabriels, et al., 2001). This can be done by examining moderators.
- Two potential moderators of interest are **object interest** and **interfering behaviors**.
- Object interest is important in the development of early communication because much social communication involves the child coordinating his or her attention between a communication partner and an object. Object interest has been shown to be a moderator of treatment (e.g. Yoder & Stone, 2006)
- Interfering behaviors (e.g., repetitive behaviors, escape behaviors, and aggressive behaviors) are general predictors of language and communication development (e.g. Bopp, et al., 2009; Dominick, et al., 2001; Lam, et al., 2008) and are potential moderators of a behaviorally-based intervention because the presence of these behaviors may affect a child's active engagement in intervention.

Research Question

Does pretest object interest and frequency of interfering behaviors (repetitive, escape, and aggressive) moderate the effect of group assignment (treatment or control) on children's communication outcomes?

Participant Characteristics

Inclusion criteria:

- Chronological age between 36 and 54 months.
- Confirmed diagnosis of ASD on the ADOS (Lord et al., 2008).
- Visual reception score of at least 18 months on the Mullen Scales for Early Learning Visual Reception subscale (Mullen, 1995).
- Fewer than 20 different words used spontaneously during a 20-minute language sample.
- Caregivers primary used English as the spoken language in the home.
- No indicated secondary medical or developmental diagnosis.

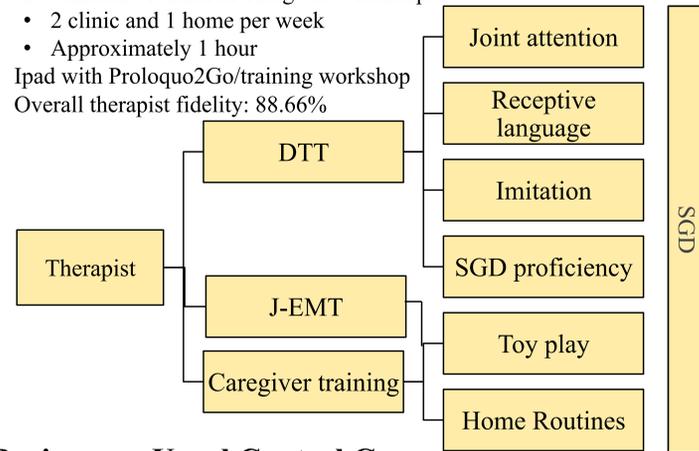
	Control (n=36)	Intervention (n=37)
Percent male	80%	81%
Percent white	63%	59%
Percent low income	18%	18%
Age at entry (months)	42.66 (5.01)	43.08 (5.06)
Mullen early learning composite	51.57 (10.42)	52.78 (8.84)
Mullen visual reception	26.26 (4.11)	26.21 (3.09)
ADOS severity score	7.31 (1.61)	7.86 (1.61)
PLS-5 total language	47.53 (16.49)	45.36 (10.35)
SCU	14.00 (19.38)	13.29 (17.07)
IJA	3.34 (4.10)	4.53 (5.50)
Object interest	16.67 (11.95)	16.45 (12.37)
Interfering behaviors		
Repetitive behaviors	0.48 (0.054)	0.65 (0.075)
Escape behaviors	0.08 (0.12)	0.08 (0.10)
Aggressive behaviors	0.04 (0.06)	0.03 (0.07)

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Methods

Intervention

- J-EMT (JASPER+Enhanced Milieu Teaching; Kasari, et al., 2014)
 - Naturalistic, developmental model of early communication intervention in which child interests and initiations are used as opportunities to model and prompt language and engagement in play and routines
- 36 sessions+ 3 didactic caregiver workshops
 - 2 clinic and 1 home per week
 - Approximately 1 hour
- Ipad with Proloquo2Go/training workshop
- Overall therapist fidelity: 88.66%



Business as Usual Control Group

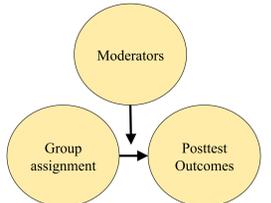
- Ipad with Proloquo2Go/training workshop

Measures

Time point	Variable type	Construct	Assessment	Reliability (ICC/% agreement)	
Pretest	Independent variable	Treatment/Control group	Randomly assigned	n/a	
		Moderators	Object interest	Structured play assessment	85.34%
	Control variables	Interfering behaviors	20-minute naturalistic language sample (2 nd sample)	Repetitive behaviors	95.28%
		Escape behaviors		96.25%	
		Aggressive behaviors		99.40%	
Posttest	Dependent variable	Age	Parent Report	n/a	
		Developmental level	Mullen visual reception subscale	n/a	
		Initiating joint attention (IJA)	Early social communication scales (ESCS)	0.83 (ICC)	
		Social communicative utterances (SCU)	20-minute naturalistic language sample	89.95%	

Analysis

- All assessments were completed and coded by individuals blind to group assignment
- Multiple regression analyses were used to identify predictors of communication and language outcomes to examine the two putative moderators on communication outcomes. A build-up approach was used for this exploratory analysis.
- Moderators were examined using interaction terms of the proposed independent variable and group assignment



Results

Pretest Correlation Analysis

Moderators	Age	ADOS Severity	Mullen VR	PLS Total language	SCU	IJA
Object interest	-0.07	-0.41**	0.40**	0.32**	0.30**	0.19
Total interfering behaviors	0.11	0.16	-0.30*	-0.11	-0.08	-0.10
Repetitive behaviors	0.13	0.14	-0.31*	-0.09	-0.09	0.11
Escape behaviors	0.07	0.12	-0.22	-0.14	-0.10	-0.21
Aggressive behaviors	0.09	-0.01	-0.10	0.02	0.02	-0.03

Moderation Analysis

Dependent variable (DV)	Model	Study group	Pretest DV	Age	Mullen VR	Independent variable (IV)	Moderated Effect of IV
SCU	Main effect	0.96 (4.68)	1.11** (0.12)	-0.68 (0.47)	1.11 (0.70)		
	Object interest	-6.43 (8.54)	1.14** (0.13)	-0.63 (0.47)	1.44 (0.74)	-0.46 (0.31)	0.44 (0.41)
	Repetitive behaviors	0.78 (6.51)	1.11** (0.12)	-0.74 (0.49)	1.21 (0.77)	25.14 (64.97)	-5.00 (0.94)
	Escape behaviors	4.84 (5.94)	1.12** (0.12)	-0.70 (0.48)	0.96 (0.73)	18.90 (26.09)	-47.46 (39.89)
	Aggressive behaviors	0.41 (5.50)	1.10** (0.12)	-0.77 (0.48)	1.21 (0.76)	42.68 (62.99)	9.85 (77.79)
	IJA	Main effect	2.01 (1.21)	0.18 (0.12)	0.05 (0.11)	-0.16 (0.19)	
Object interest		5.99** (2.06)	0.24 (0.13)	0.00 (0.11)	-0.22 (0.21)	0.12 (0.07)	-0.23* (0.10)
Repetitive behaviors		2.09 (1.68)	0.17 (0.13)	0.04 (0.12)	-0.17 (0.22)	2.08 (17.90)	-2.54 (20.13)
Escape behaviors		-0.27 (1.45)	0.22 (0.12)	0.03 (0.11)	-0.11 (0.19)	-5.71 (6.31)	23.97* (9.32)
Aggressive behaviors		2.77 (1.43)	0.16 (0.12)	0.03 (0.12)	-0.21 (0.21)	15.34 (19.60)	-24.39 (21.70)

Model building has been reduced for space. There were no significant direct effects of the independent variables in the dependent variables.

Implications

Conclusions

- Object interest significantly moderated the effect of group assignment on the frequency of initiating joint attention, such that children in the intervention group who began treatment with lower object interest made greater gains in intervention.
 - Implication:** This finding is consistent with the literature that suggests that children with lower object interest may benefit more from play-based naturalistic interventions.
- Escape behaviors significantly moderated the effect of group assignment on the frequency of initiating joint attention, such that children in the intervention group who began treatment with fewer escape behaviors made greater gains in intervention.
 - Implication:** The frequency of escape maintained behaviors likely effects the dosage of treatment the child received, thereby effecting outcomes.

Limitations

- High variability was observed both between children and within children. Further analyses should examine variables accounting for this variability.
- The lack of significant findings on SCU, a more distal measure of communication, may suggest that the effects of the putative moderators do not influence more distal outcomes of the intervention.

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