Understanding Language and Social Regression in Children with Autism Spectrum Disorder (ASD):
Findings from the Study to Explore Early Development (SEED)

Nuri M. Reyes, Ph.D. et al.
JFK Partners/Children Hospital Colorado
University of Colorado, Anschutz Medical Center

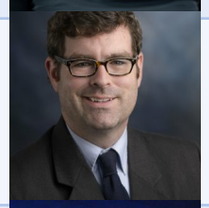
4/28/2022

University of Colorado
Anschutz Medical Campus

JFK Partners
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Nuri M. Reyes, Ph.D. et al. (in preparation)

Study to Explore Early Development

	**Norbert G. Soke**	Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities
	**Lisa D. Wiggins**	Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities/Developmental Disabilities Branch
	**Brian Barger**	School of Public Health, Center for Leadership in Disability, Georgia State University
	**Eric Moody**	University of Wyoming
	**Judy Reaven**	Departments of Pediatrics and Psychiatry, University of Colorado;
	**Cordelia Robinson Rosenberg**	Departments of Pediatrics and Psychiatry, University of Colorado;
	**Ann Reynolds**	Departments of Pediatrics and Psychiatry, University of Colorado
	**Laura Schieve**	Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities/Developmental Disabilities Branch
	**& Susan Hepburn**	Department of Human Development & Family Studies, Colorado State University

Developmental Regression

Development Regression:
Loss of previously-acquired skills

Language

Social

Play

Children with ASD and regression

Aims

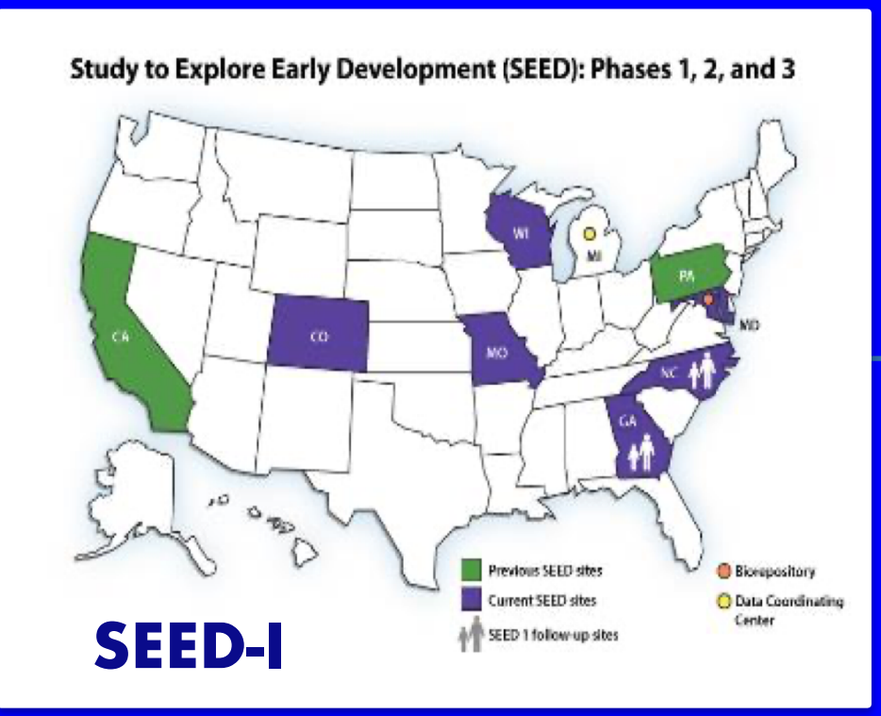
Aim 1: To Assess Proportions

- Language Regression
- Social Regression

Aim 2: To Examine Differences

- Developmental Levels
- Adaptive Functioning
- Behavior/Emotional Problems

Participants



SEED-I

671 met the case definition for ASD

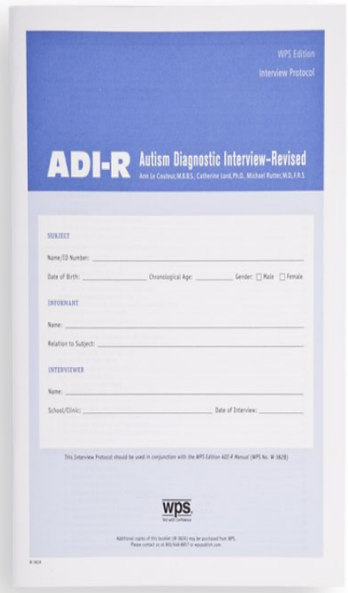
=121 =550

Autism Diagnostic Observation Schedule (ADOS)

Autism Diagnostic Interview-Revised (ADI-R)

Aim 1: Proportions

Operational Definition: Developmental Regression



Four groups

Based on the ADI-R's regression section

No regression
n: 497

Boys=409 (82.30%)
Girls=88 (17.17%)

Language regression only
n=60

Boys=50 (83.30%)
Girls=10 (16.70%)

Social regression only
n=58

Boys=48 (82.80%)
Girls=10 (17.20)

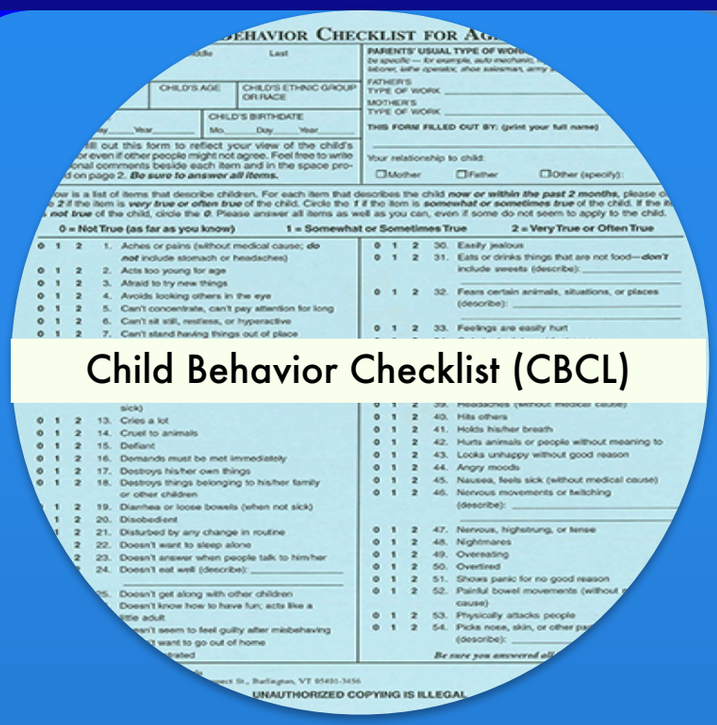
Language+social regression
n=56

Boys=43 (76.80%)
Girls=13 (23.20%)

Aim 2: Differences in Functioning

- To evaluate developmental levels (i.e., language, fine motor, and visual reception abilities).

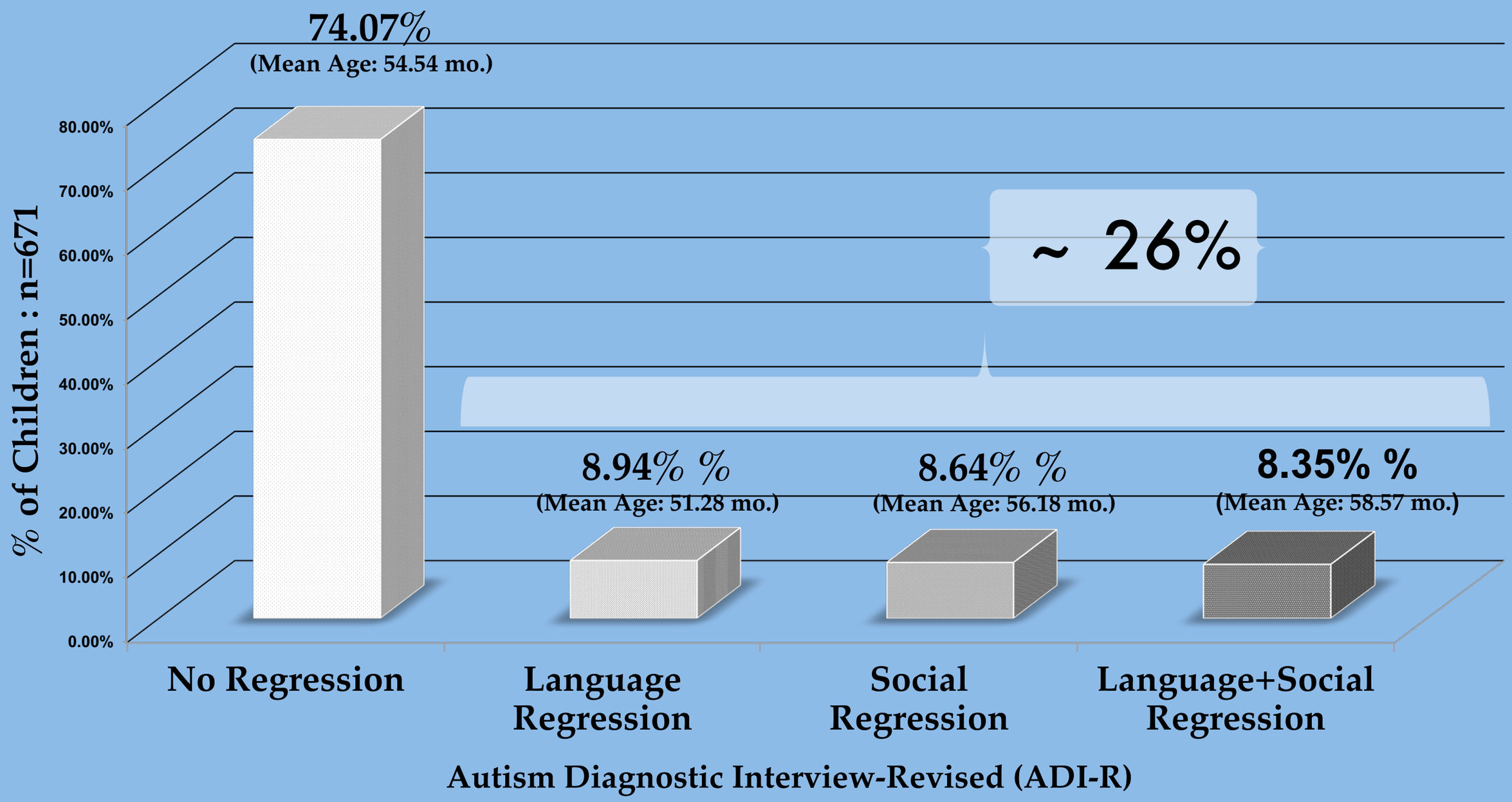
- To assess adaptive skills (i.e., activities of daily living).



- To examine behavior and emotional problems (i.e., internalizing & externalizing problems).

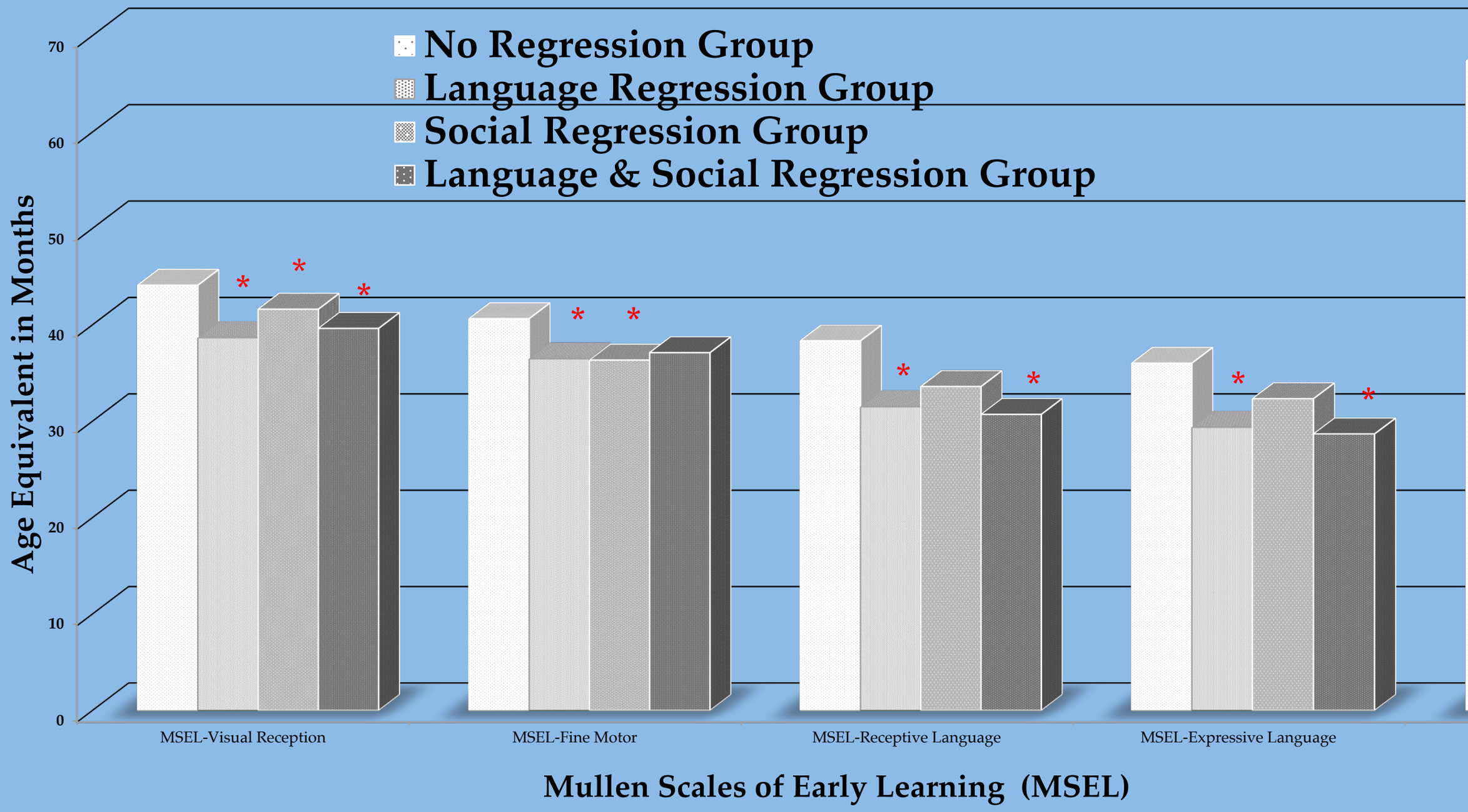
Estimates of Language and Social Regression (Aim 1)

- **Figure 1:** Percentage of Language and Social Regression



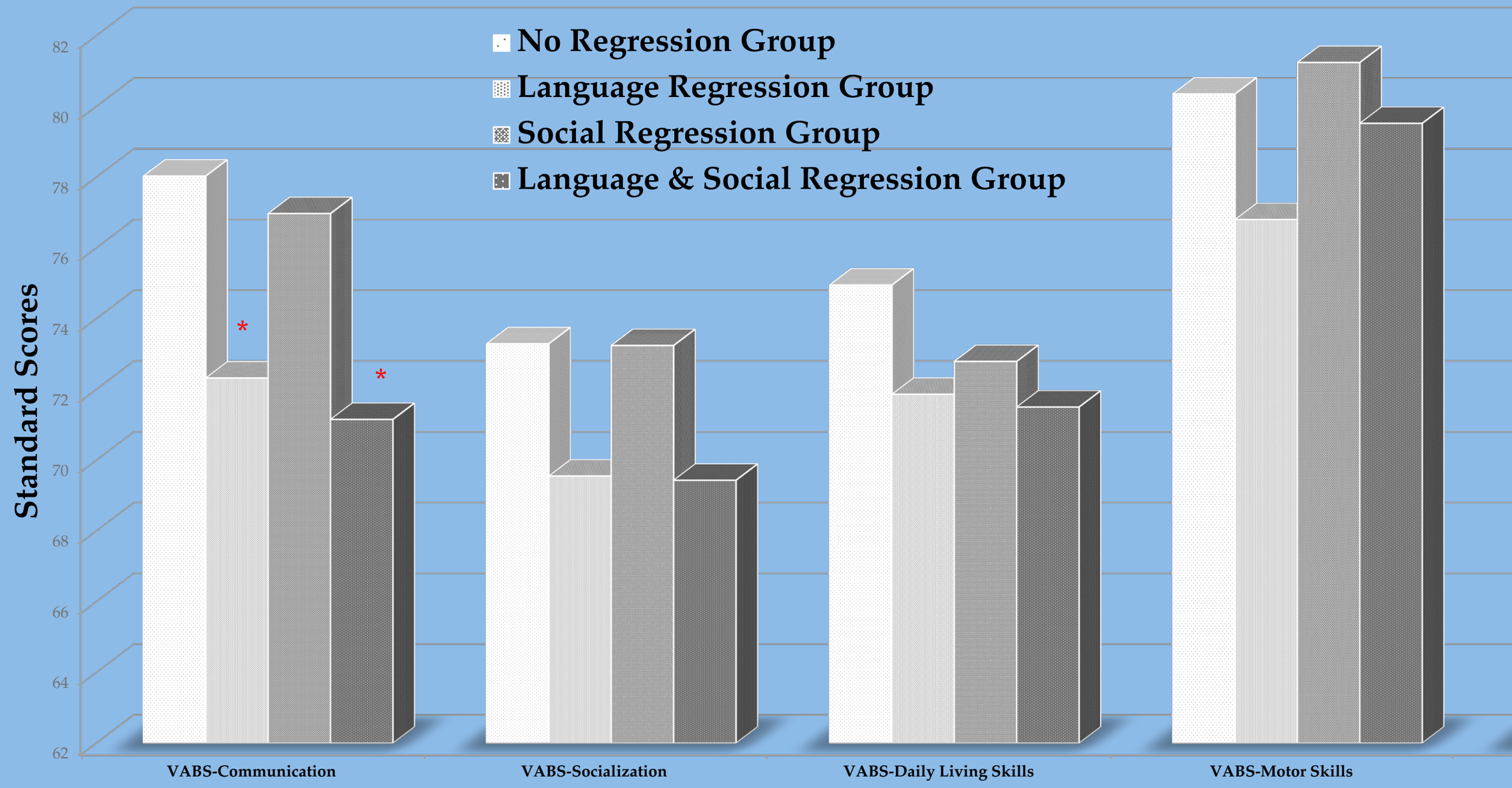
Developmental Levels (Aim 2a)

- **Figure 2:** Differences between Groups in Developmental Levels

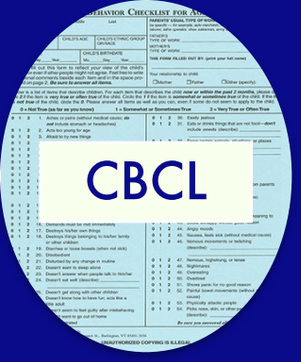


Adaptive Functioning (Aim 2b)

- **Figure 3: Differences between Groups in Adaptive Functioning**

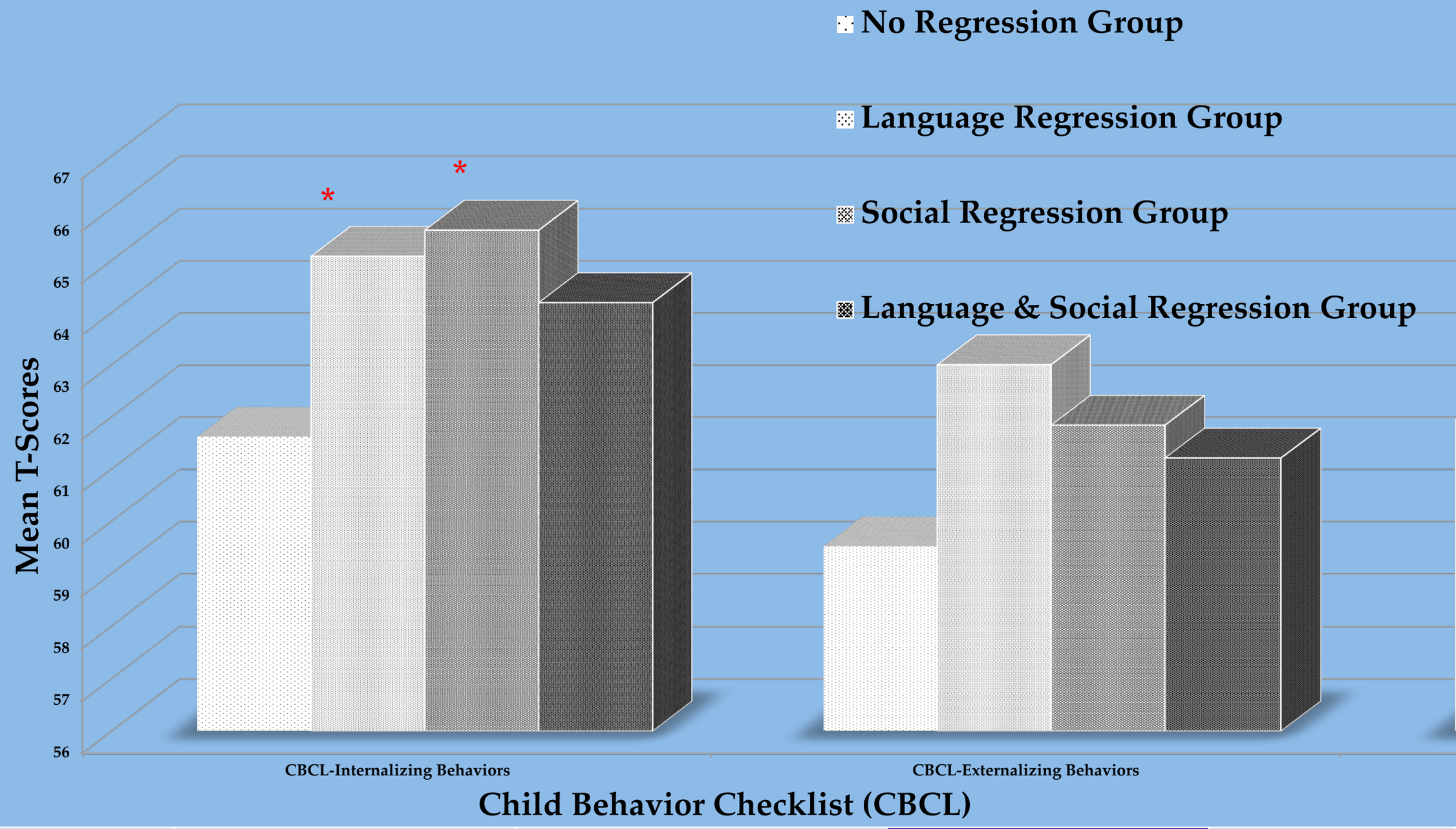


Vineland Adaptive Behavior Scales -Second Edition (Vineland-2)



Behavior and Emotional Problems (Aim 2c)

- **Figure 4: Differences between Groups in Behavior and Emotional Problems**



Discussion

Occurrence of Regression:

~ 26% of children with ASD

Lower developmental levels during the preschool years

Lower adaptive communication skills

Increased internalizing problems

History of Regression

Conclusions

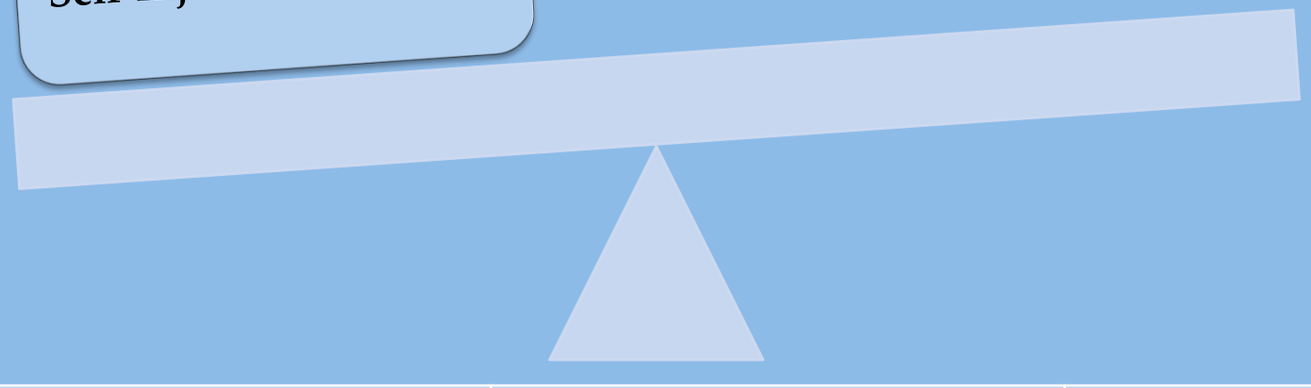
Poor outcomes

Regression?

Seizures

Language skills/IQ

Aggression/
Self-Injurious Behaviors



Conclusions

2022

Sample:
n=421: 2-5 y.o.

#regression:
n=90 (22%)

Phrase speech:
Same time

Followed up: 10 y.o.:
No differences in communication

The Journal of Child Psychology and Psychiatry

ACAMH The Association for Child and Adolescent Mental Health

Journal of Child Psychology and Psychiatry **:* (2022), pp **–** doi:10.1111/jcpp.13565

Predictors of language regression and its association with subsequent communication development in children with autism

Andrew Pickles,[1] Nicola Wright,[1] Rachael Bedford,[2] Mandy Steiman,[3] Eric Duku,[4] Teresa Bennett,[4] Stelios Georgiades,[4] Connor M. Kerns,[5] Pat Mirenda,[5] Isabel M. Smith,[6] Wendy J. Ungar,[7] Tracy Vaillancourt,[8] Charlotte Waddell,[5] Anat Zaidman-Zait,[9] Lonnie Zwaigenbaum,[10] Peter Szatmari,[7] Mayada Elsabbagh,[3] and Pathways in ASD Study Team

[1]Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK; [2]University of Bath, Bath, UK; [3]Azrieli Centre for Autism Research, Montreal Neurological Hospital, McGill University, Montreal, QC, Canada; [4]McMaster University, Hamilton, ON, Canada; [5]University of British Columbia, Vancouver, BC, Canada; [6]Dalhousie University, Halifax, NS, Canada; [7]Hospital for Sick Children Research Institute, University of Toronto, Toronto, ON, Canada; [8]University of Ottawa, Ottawa, ON, Canada; [9]Tel Aviv University, Tel Aviv, Israel; [10]University of Alberta, Edmonton, AB, Canada

Conclusions

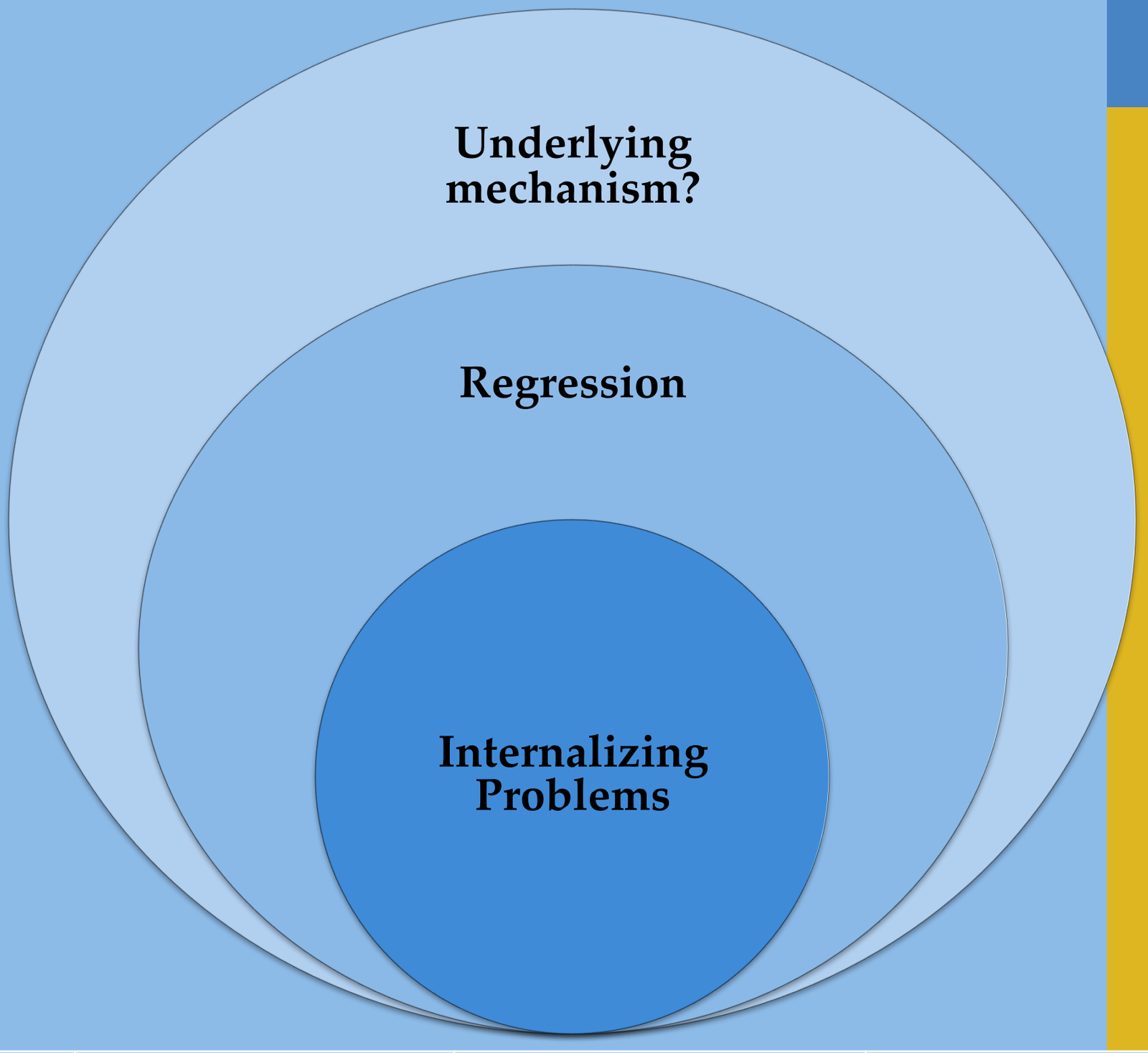
Response to treatment?

- Earlier concerns?
- Earlier diagnosis?
- Earlier intervention services?

- Long term language effects ✓
- Other areas?

Regression

Conclusions



References

- Bernabei, P., Cerquiglini, A., Cortesi, F., & D'ardia, C. (2007). Regression versus no regression in the autistic disorder: Developmental trajectories. *Journal of autism and developmental disorders*, *37*(3), 580-588.
- Brown, J., & Prelock, P. A. (1995). Brief report: The impact of regression on language development in autism. *Journal of Autism and Developmental Disorders*, *25*(3), 305-309.
- Davidovitch, M., Glick, L., Holtzman, G., Tirosh, E., & Safir, M. P. (2000). Developmental regression in autism: Maternal perception. *Journal of Autism and Developmental Disorders*, *30*(2), 113-119
- Goldberg, W. A., Osann, K., Filipek, P. A., Laulhere, T., Jarvis, K., Modahl, C., ... & Spence, M. A. (2003). Language and other regression: Assessment and timing. *Journal of Autism and Developmental Disorders*, *33*(6), 607-616.
- Hansen, R. L., Ozonoff, S., Krakowiak, P., Angkustsiri, K., Jones, C., Deprey, L. J., ... & Hertz-Picciotto, I. (2008). Regression in autism: Prevalence and associated factors in the CHARGE Study. *Ambulatory Pediatrics*, *8*(1), 25-31.
- Luyster, R., Richler, J., Risi, S., Hsu, W. L., Dawson, G., Bernier, R., ... & Goudie-Nice, J. (2005). Early regression in social communication in autism spectrum disorders: A CPEA Study. *Developmental Neuropsychology*, *27*(3), 311-336.
- Osterling, J. A., Dawson, G., & Munson, J. A. (2002). Early recognition of 1-year-old infants with autism spectrum disorder versus mental retardation. *Development and Psychopathology*, *14*(2), 239-251.
- Ozonoff, S., Williams, B. J., & Landa, R. (2005). Parental report of the early development of children with regressive autism: the delays-plus-regression phenotype. *Autism*, *9*(5), 461-486.
- Parr, J. R., Le Couteur, A., Baird, G., Rutter, M., Pickles, A., Fombonne, E., ... & International Molecular Genetic Study of Autism Consortium. (2011). Early developmental regression in autism spectrum disorder: Evidence from an international multiplex sample. *Journal of Autism and Developmental Disorders*, *41*(3), 332-340.
- **Pickles, A., Wright, N., Bedford, R., Steiman, M., Duku, E., Bennett, T., ... & Pathways in ASD Study Team. (2022). Predictors of language regression and its association with subsequent communication development in children with autism. *Journal of Child Psychology and Psychiatry*.**
- Richler, J., Luyster, R., Risi, S., Hsu, W. L., Dawson, G., Bernier, R., ... & Goudie-Nice, J. (2006). Is there a 'regressive phenotype'of autism spectrum disorder associated with the measles-mumps-rubella vaccine? A CPEA study. *Journal of Autism and Developmental Disorders*, *36*(3), 299-316.
- Rogers, S. J. (2004). Developmental regression in autism spectrum disorders. *Mental Retardation and Developmental Disabilities Research Reviews*, *10*(2), 139-143.
- Shinnar, S., Rapin, I., Arnold, S., Tuchman, R. F., Shulman, L., Ballaban-Gil, K., ... & Volkmar, F. R. (2001). Language regression in childhood. *Pediatric Neurology*, *24*(3), 185-191.
- Siperstein, R., & Volkmar, F. (2004). Brief report: Parental reporting of regression in children with pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, *34*(6), 731-734.
- Stefanatos, Gerry A. "Regression in autistic spectrum disorders." *Neuropsychology Review* 18, no. 4 (2008): 305-319.
- Tuchman, R. F., & Rapin, I. (1997). Regression in pervasive developmental disorders: seizures and epileptiform electroencephalogram correlates. *Pediatrics*, *99*(4), 560-566.
- Werner, E., & Dawson, G. (2005). Validation of the phenomenon of autistic regression using home videotapes. *Archives of General Psychiatry*, *62*(8), 889-895.
- Wiggins, L. D., Rice, C. E., & Baio, J. (2009). Developmental regression in children with an autism spectrum disorder identified by a population-based surveillance system. *Autism*, *13*(4), 357-374.
- Yirmiya, N., & Charman, T. (2010). The prodrome of autism: early behavioral and biological signs, regression, peri-and post-natal development and genetics. *Journal of Child Psychology and Psychiatry*, *51*(4), 432-458.