

Introduction

- The exertion of effort is one component of reward processing thought to differ in nonautistic and autistic children¹
- Many behavioral interventions for autism rely on rewards to reinforce effort
- Better understanding and measurement of effort may allow clinicians to improve treatment plans

Objectives

- 1) Determine how chronological age and developmental age relate to effort in nonautistic and autistic children
- 2) Determine if temperament predicts the child's effort when encouraged by a caregiver to exert effort

Methods

- Children aged 3-5 years (n=82; Table 1) were administered pressMORE (pressing Measure Of Rewarded Effort), a musical bubble machine that requires progressively more button presses to activate (1,1,2,2,4,6,8...)
- **Nonsocial condition:** caregiver does not engage with child
- **Social condition:** caregiver instructed to encourage the child

Effort Variables:

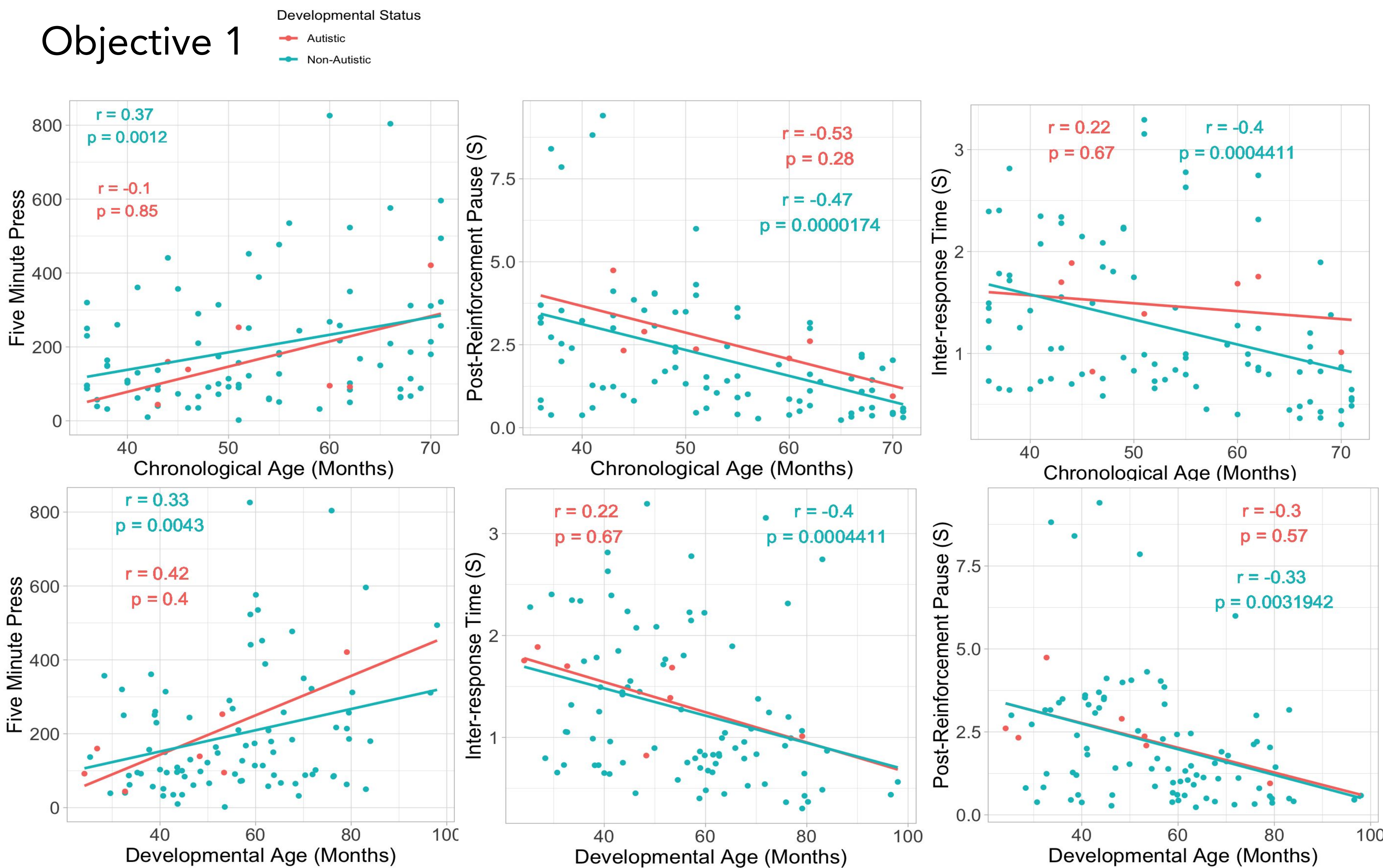
- **Five minute press (FMP):** amount of button presses within the first five minutes of the trial; developmentally appropriate alternative to breakpoint
- **Post-reinforcement pause (PRP):** duration of time between receiving a reward and resuming button presses
- **Inter-response time (IRT):** duration of time between each between press

Other Variables:

- **Developmental Age:** computed as DAS-II GCA * Chronological Age / 100
- **Children's Behavior Questionnaire (CBQ):** parent-report temperament measure that includes subscales of activity level, anger, inhibitory control, and high intensity pleasure²

Results

Objective 1

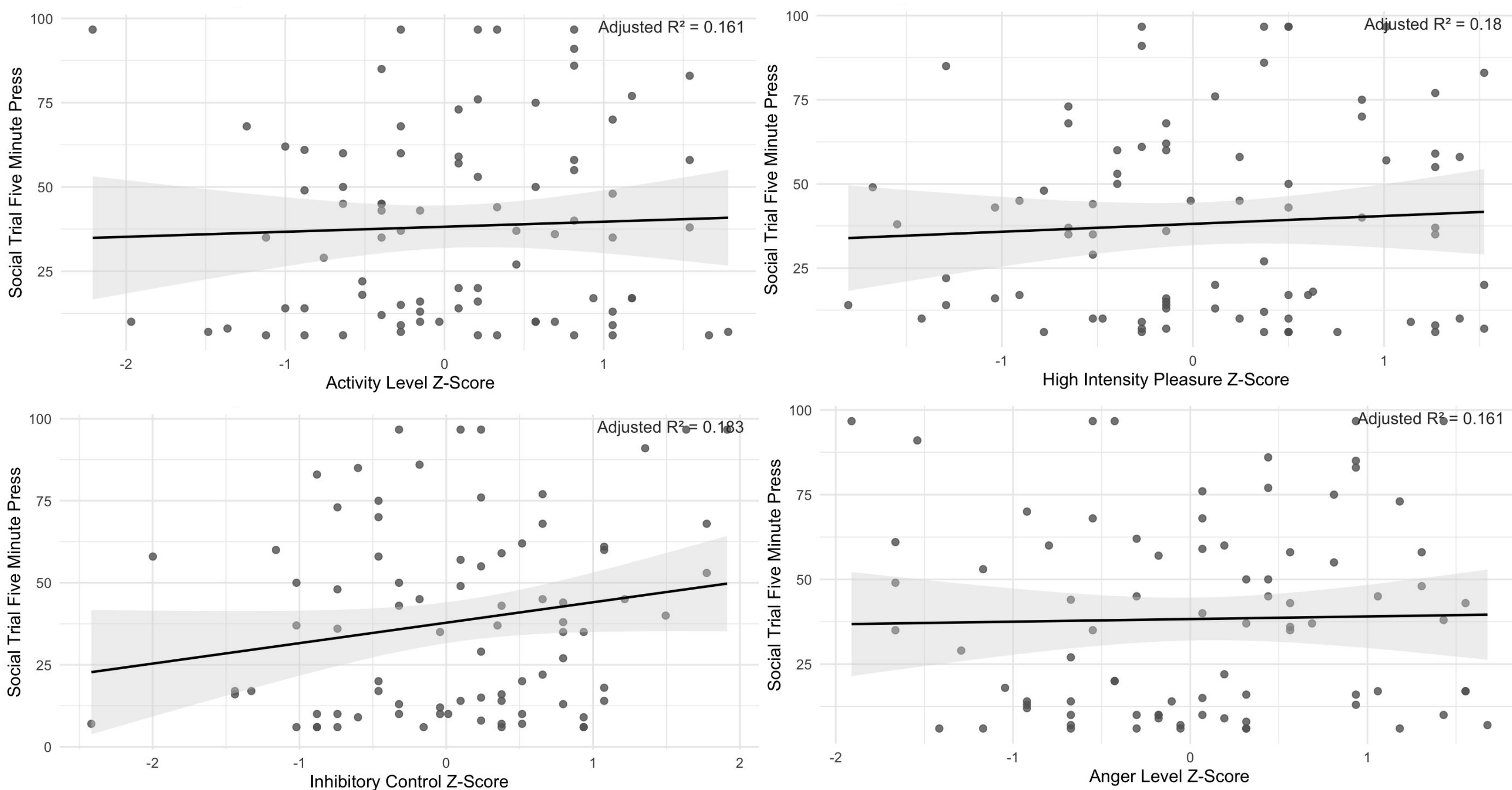


- For nonautistic children, both chronological and developmental age correlated positively with FMP and negatively with PRP and IRT
- In exploratory analyses with 7 autistic children, similar trends were observed (no significant effects)

Analyses:

- 6 Pearson correlations were run between chronological or developmental age and FMP, PRP, and IRT
- 4 multiple linear regressions were run for each CBQ subscale predicting social FMP, controlling for chronological age and nonsocial FMP

Objective 2



- Activity level, high intensity pleasure, inhibitory control, and anger did not predict FMP during the social condition (caregiver encouragement)

1. Table 1. Demographics

Variable	TD	AUT
N	75 (91.5)	7 (8.5)
Female	39 (52.0)	5 (71.4)
Male	36 (48.0)	2 (28.6)
Age in Years		
Mean (SD)	4 (0.8)	3.8 (1)
Race		
White	55 (73.3)	3 (42.9)
Black	8 (10.7)	0 (0)
Multiracial	12 (16.0)	4 (57.1)
Hispanic		
Hispanic	14 (18.7)	3 (42.9)
Not Hispanic	61 (81.3)	4 (57.1)
DAS-II GCA		
Mean (SD)	105 (18.3)	79 (25.8)

Discussion

- Both chronological and developmental age variables correlated with effort outcome variables in nonautistic preschoolers, consistent with findings in older children³ No significant results observed for autistic sample, potentially due to being underpowered
- Selected temperament traits did not predict the child's effort while caregiver encouraged them
- Future studies need to explore sources of individual differences in effort when encouraged, and the connection between effort and response to early intervention

References

1. Clements, C. C., et al. (2023). *JAACAP*. <https://doi.org/10.1016/j.jaac.2022.07.861>
2. Rothbart, M. K., et al. (2001). *Child Dev.* <https://doi.org/10.1111/1467-8624.00355>
3. Chelonis, J. J., et al. (2011). *Beh. Pro.* <https://doi.org/10.1016/j.beproc.2011.03.008>

Acknowledgments

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