

Background

- Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that is characterized by social and communication deficits and restricted, repetitive behaviors
- There is a high co-occurrence of sleep problems in ASD: 40-80% of children with ASD report sleep difficulties as compared to just 20% of their neurotypical peers (Brown, 2016)
 - Sleep problems present heterogeneously in this population, but an extended sleep onset latency (SOL) is a common marker of sleep disturbance and a characteristic of pediatric insomnia
- Sleep disturbance is a predictor for more severe aberrant behaviors in children with ASD
 - Poor sleep has been associated with greater reported social deficits, inattention, and oppositional behaviors in ASD children
 - It is unclear whether the sleep problems are the result or the cause of the behavioral problems
- This retrospective analysis aimed to determine the relationship between sleep disturbance and behavioral issues

Participants & Method

- Participants:**
- Children who were evaluated by the Yale Child Study Center Developmental Disabilities clinic between 2000 and March 2017
 - Inclusion criteria**
 - A confirmed diagnosis of ASD, as indicated in their history
 - A completed parent-reported sleep history questionnaire
 - A completed parent-reported 5 item behavioral screener
 - Exclusion criteria:**
 - medication to assist with sleep: melatonin, Risperdal, Clonidine, Inderal
 - N=100 children and adolescents met criteria
 - Children were stratified into good (n=60) and poor (n=40) sleepers, as defined by a sleep onset latency (SOL) \geq 30 minutes (Montgomery, 2006; Brown, 2016)
- Tools**
- The sleep history questionnaire is a parent reported measure on their child's sleep history, which provides information about the child's sleep over the past month, including bed time, wake time, and SOL
 - The behavioral checklist consists of 5 aberrant behaviors for parents to endorse
 - Screaming
 - Hitting
 - Biting
 - Self-injurious behavior (SIB)
 - Vineland-II subdomains (available for n=62 participants)
 - V-scale scores are indicators of functioning in varying life domains, that are scaled relative to children of the same age
 - V-scale score mean is 15, with a standard deviation of 3
- Statistical Analysis**
- The presence of behavioral problems and V-scores of Vineland adaptive behavior subscales were analyzed using repeated measures analysis of variance (ANOVA), with post-hoc independent sample T-tests
 - Correlations were used to examine relationships with Vineland scores and SOL
 - Participants with outlier SOLs were excluded (SOL > 180 minutes)

Results

	Mean (SD)		
	N	Age (years)	Sleep Onset Latency (min)
Poor Sleepers	40	7.3 (3.7)	64.4 (36.7)
Good Sleepers	60	7.5 (3.7)	11.7 (6.2)
All participants	100	7.1 (3.6)	32.8 (35.0)

Table 1: All participants were stratified into two groups according to their SOL. No significant differences were found in their mean age or score on the autism screening questionnaire

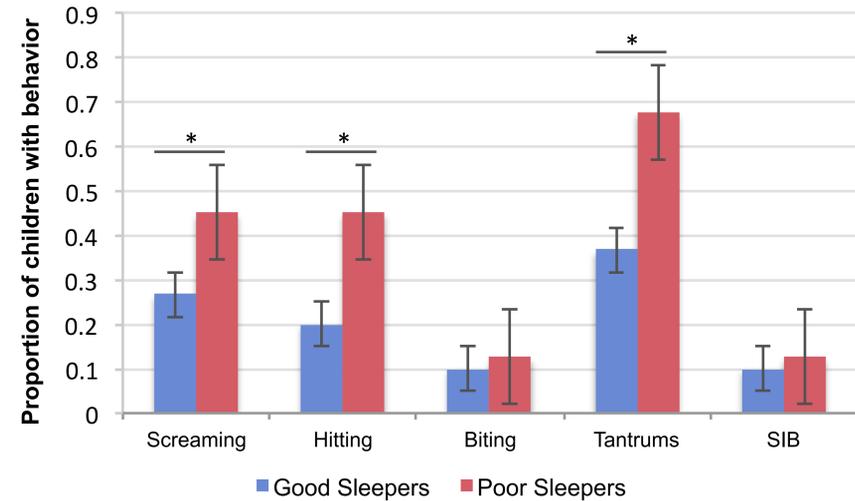


Figure 1: Frequency of parent-endorsed behavioral problems, between cohorts. Parents of children with impaired sleep were more likely to endorse that their child engaged in the following aberrant behaviors: screaming, hitting, and tantrums

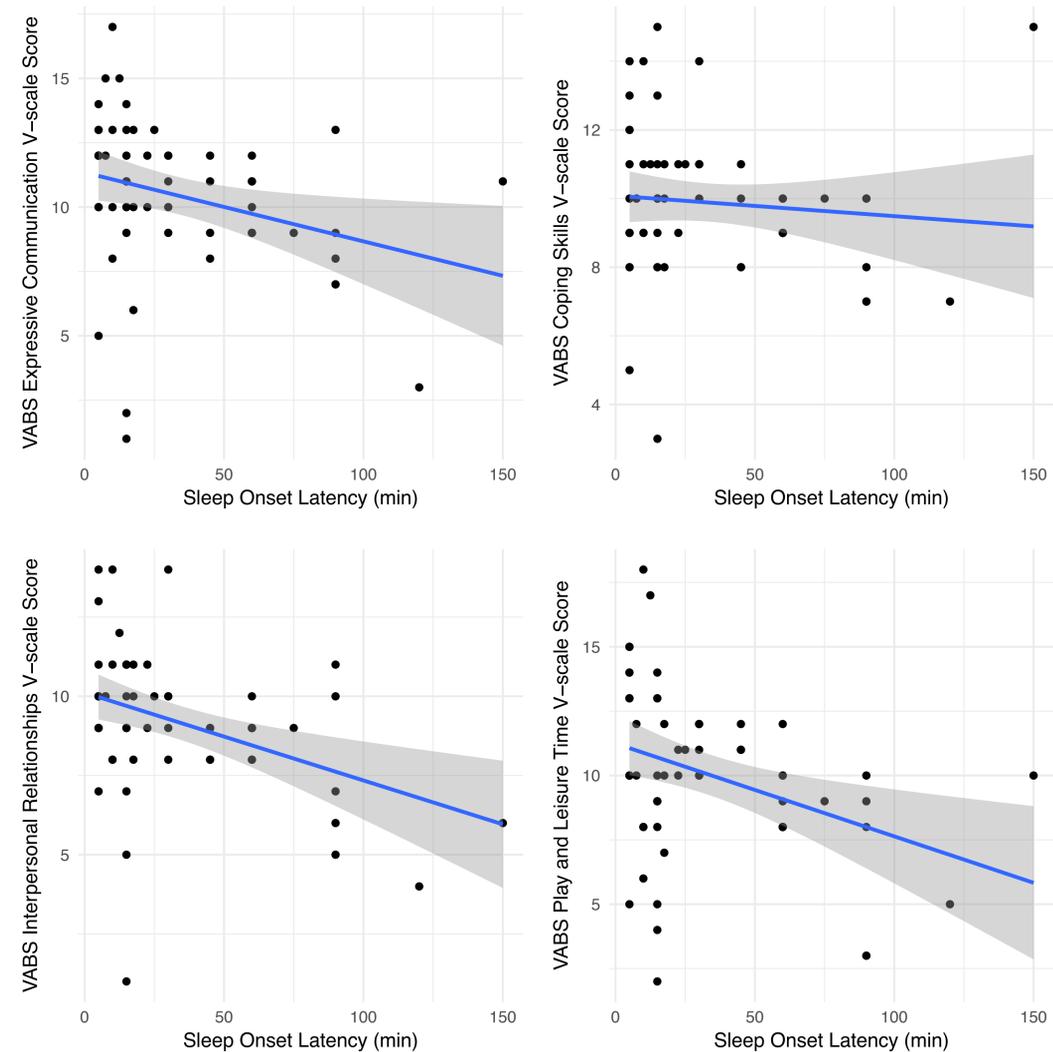


Figure 2: A greater sleep onset latency is associated with lower V-scale subdomain scores on the Vineland-II Adaptive Behavior Scales (VABS) (n=62). There was a significant correlation in 4 subdomains: Expressive Communication (p<0.05), Coping Skills (p<0.05), Interpersonal (p<0.01), and Play and Leisure Time (p<0.01)

References

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Conclusions

- 40% of the population of children with ASD met the criteria for poor sleep, a proportion consistent with the literature
- Children who experience difficulty sleeping are more likely to exhibit behavioral problems such as screaming, hitting and tantrums
- A greater SOL is associated with worse adaptive functioning, as measured by the VABS subdomain V-scale scores
 - The subdomains for which there was a significant association with sleep include those related to appropriate expression of emotion and interaction with others
 - However, it remains unclear the impairment in which factor, sleep or adaptive behavior, fuels the other. It is likely a bidirectional relationship
- Future analyses of sleep disturbances in ASD should control for factors such as age, sex and autism severity, and use more powerful measures of sleep disturbance
- Future studies comparing the severity of behavioral problems before and after intervention for poor sleep will further clarify the relationship between sleep and behavioral disturbances