Differences in Timeliness of Autism Diagnosis in Autistic Children with and without Co-Occurring Intellectual Disability

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Background

- Almost 40% of autistic children have co-occurring intellectual disability (ID), however, this population remains under-researched.[1]
- In the United States, the median age of autism diagnosis is 53 months; it is 43 months for those with co-occurring ID.[1]
- Age of first parent developmental concerns differs in autistic children with and without co-occurring ID: 22 months and 30 months, respectively.[2] This difference can provide important insight into each group's diagnostic process.
- Prior research on socioeconomic factors, including household income and timeliness of autism diagnoses, are inconsistent and limited. [1, 3, 4]
- Prompt detection is essential for early intervention services; therefore, it is important to understand contributing factors to variations in autism diagnostic timeliness, suggesting that it should be considered in analyses for future research.

Objectives

The current study aimed to examine timeliness of autism diagnoses in relation to age of first parent concern (PC) and household income (HI) in autistic children without (ASD) and with co-occurring intellectual disability (ASD+ID). It was predicted that 1) the ASD+ID group would have earlier PC and diagnosis compared to the ASD group and 2) higher HI would be associated with earlier diagnosis.

This study also aimed to learn more about the types of initial parental concerns of autistic children with co-occurring intellectual disability which is an under-researched population within the field of autism research.

Methods & Approach

PARTICIPANT CHARACTERISTICS

- 42 autistic children participated in this study, with 21 children in each diagnostic group: ASD (female=2) and ASD+ID (female=3; *Table* 1). Within the ASD group, 76.19% of participants were non-Hispanic White. Within the ASD+ID group, 38.09% were non-Hispanic White.

	ASD	ASD+ID
	Mean (SD)	Mean (SD)
Age (years)	10.68 (3.74)	12.56 (3.73)
IQ*	**105.76 (20.63)**	**31.63 (13.66)**
Household Income	188,764 (153,499)	108,105 (59,427)
Age of First Parent Concern (months)	21.04 (16.49)	14.76 (10.01)
Age at Autism Diagnosis (months)*	**51.80 (31.69)**	**28.09 (12.32)**
Diagnostic Delay (months)*	**30.76 (26.41)**	**13.33 (11.53)**

***Table 1.* Participant characteristic by diagnostic group.** * indicates significant group differences (p< 0.05); 6 participants did not report household income (4 ASD & 2 ASD+ID).

Methods & Approach

MEASURES AND BEHAVIORAL ASSESSMENTS

- Autism and ID diagnoses were confirmed via ADOS-2, ADI-R, cognitive testing (Mullen, DAS-II, WASI-II), and expert clinician endorsement of DSM-5 criteria.
- Parents also completed a demographics form and a non-standardized diagnostic history and parental concerns questionnaire.
- Time between PC and autism diagnosis was calculated as diagnosis delay (DD).

STATISTICAL ANALYSIS

- T-tests were performed to compare PC, DD, and HI between groups.
- Regression models were performed to examine the association between HI and DD in each diagnostic group.
- Percentages for each group of initial parent concerns for the ASD+ID were also calculated.

Results

- PC did not differ significantly by group (t(32)=1.49, *p*=0.14), however significant differences were observed in age of autism diagnosis and DD (*Figure 1*).

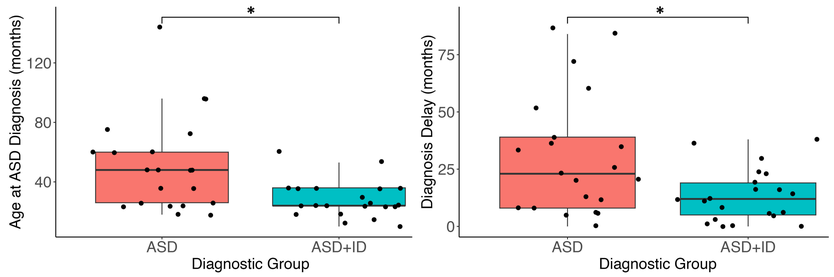

Figure 1. The ASD+ID group had significantly earlier age of autism diagnosis (t(25)=3.19, *p*=0.003) and a significantly shorter DD compared to the ASD group (t(27)=2.77, *p*=0.009).

- A two-way ANOVA was performed to analyze the effect of diagnostic groups and HI on DD. It was revealed that there was not a significant interaction between the effects of diagnostic group and HI on DD (F(1,32)=1.635, p=0.210; *Figure 2*). Of note, the ASD group had higher HI (t(20)=2.03, *p*=0.055).

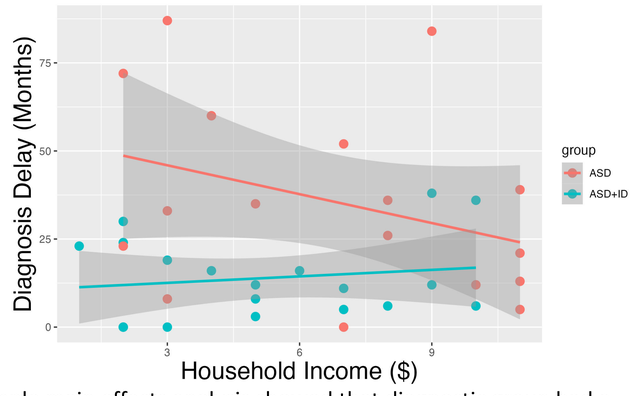

Figure 2. Simple main effects analysis showed that diagnostic group had a significant effect on DD (p=0.0049). However, for the ASD group only, higher HI was trending in association to a shorter DD (ß=-7.62e-05, t=-1.86, *p*=0.08). HI was binned by $20,000 in the figure.

Results continued

Parent concern type in the ASD+ID group was highest in Cognitive Learning, Hearing and Behavior, and lowest in Motor (*Table 2*).

Parent Concern Type	Parents Reporting Concern (% / Count)	Parents Reporting No Concern (% / Count)
Cognitive Learning	85.7% / 18	0.0% / 0
Behavior	81.0% / 17	4.8% / 1
Motor	19.0% / 4	66.7% / 14
Hearing	85.7% / 18	0.0% / 0

Table 2. Initial parent concern percentage and count in ASD+ID group. Three parents did complete the questionnaire and did not report data.

Conclusions

- Consistent with our hypothesis and prior literature, autistic children with co-occurring ID were diagnosed earlier than those without ID.
- Interestingly, the ASD+ID group in our study was diagnosed approximately one year earlier than the national median. This may be due to differences in availability of resources in different geographic regions and presentations in our sample.
- There was also a longer DD in the ASD group without co-occurring ID. This indicates that children with more severe symptomatology receive diagnoses more quickly.
- Because group differences were observed in HI, future research should aim to include more economically diverse and evenly matched samples.
- HI was related to diagnosis timeliness in the ASD group only, with a longer diagnostic delay occurring for those with lower household income. This variation in diagnostic delay should be further researched as access to diagnostic services and other socioeconomic factors such as parental education status may play a role in this relationship.
- Racial and ethnic diversity was also uneven across groups, with the ASD group having double the amount of non-Hispanic White participants. Future research should also aim to increase more racially and ethnically diverse participants to accurately capture individuals across the autism spectrum as the prevalence of autism is increasing across multiple racial and ethnic groups, per the latest Autism and Developmental Disabilities Monitoring Network report in 2020. [1]

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