INTRODUCTION

• An estimated 3.14% of autistic individuals have IQs in the range of intellectual disability (Full Scale IQ score ≤70).  
• The relationship between intellectual disability (ID) and autism is unclear.  
• A few small-sized studies have begun to analyze the neurobiology of these children via magnetic resonance imaging (MRI).  
• Most MRI studies lack representation from both autistic children with ID and female autistic children, which means these children are not being seen in our current literature.  
• There are concerns that standard IQ assessments are biased towards a privileged non-autistic norm.  
• It is important to consider demographic variables as potential confounds when evaluating IQ scores in autistic children.

OBJECTIVE

• Analyze the demographic characteristics of autistic children with ID (FSIQ<70) and without ID (FSIQ>70) in terms of race/ethnicity, parental education, parental socioeconomic status, and the researchers’ ability to obtain an MRI scan.  
• Explore if FSIQ scores differ across these demographics, which may represent IQ assessment bias.  
• Assess the common perception that autistic children with ID are too challenging to undergo MRI scanning.  
• Gain a better understanding of Autism Phenome Project (APP) cohort demographics to influence further research.

METHODS

Participants  
• The UC Davis Autism Phenome Project is a longitudinal MRI study evaluating brain developmental trajectories throughout childhood.

Information Collection  
• Demographic characteristics: survey completed by the child’s caregiver  
• Intellectual ability: FSIQ assessments conducted by psychologists at the MIND, depending on the child’s age: Time 1 (MSEL), Time 3 (DAS Early School, DAS School Age), and Time 4 (DAS School Age).  
• MRI Scan Procedure: researchers and a caregiver devise a plan to best obtain a successful scan for each child. The MRI scans were taken during natural sleep at Time 1 and 3 and while awake at Time 4.  
• Groups: difference between autistic children with and without ID FSIQs were assessed for race/ethnicity, SES, maternal and paternal education, and MRI scan ability.  
• All statistical tests and visual creation utilized R Studio programming.

RESULTS

• Intellectual Ability Does Not Differ Among Racial Identity/Ethnicity Groups at T1  

• Intellectual Ability Does Not Differ Regarding Awake MRI Scan Ability at T4  

SUMMARY

• Within these participants, there were no significant associations between racial identity/ethnicity groups, SES, both maternal and paternal education levels, and the researchers’ ability to obtain an MRI scan and whether an autistic child has an FSIQ score in or out of the range of ID.

REFERENCES


ACKNOWLEDGEMENTS

I would like to thank the Kennedy Krieger Institute, the UC Davis: MIND Institute, and the Maternal Child Health Leadership Education Program for supporting me throughout this research process. I would also like to thank Dr. Nofziger, Dr. Lee, Dr. Bleicher, Dr. Van Eck, Dr. Lind, Dr. Heath, Kn. Akers, Ms. Heckman, Ms. Hermitz, Ms. Clamert, and the APP/GAIN research team for their constant guidance and care in my research. Lastly, I am truly grateful for the children and families who participated in the APP study.

CONCLUSIONS

• This cohort does not appear to be impacted by IQ assessment biasing towards a privileged norm. However, these findings are not generalizable to the broader population regarding the impact of inequity and systems of oppression such as racism and ableism. The MRI scan-ability findings suggest that autistic children with ID are able to complete MRI scanning at the same rate as autistic children without ID.  
• These findings will shape future analysis of the neurobiological phenotype comparisons among these APP participants.  
• Future research should explore: 1. the normative prejudice of IQ assessments, specifically in their ability to assess autistic children’s intellectual ability as well as other marginalized communities in hopes of developing more equitable and representative IQ assessments 2. the impact of intersectional marginalization, stress, and reduced resources on autistic children’s intellectual development and their well-being.

STRENGTHS & LIMITATIONS

• More representation of female autistic children (1/3 female) and autistic children with ID compared to most autism studies. Also, the longitudinal nature is rare and allows for deeper analyses to be explored.  
• Determining whether an autistic child has ID based on their FSIQ is unreliable because of:  
  1. The probable privilege bias of standard IQ tests lead many to question their ability to accurately represent a child’s intellectual ability.  
  2. Before 5 years, IQ assessments are considered unreliable measurements.  
  3. The determination of intellectual disability was based on FSIQ rather than a clinical diagnosis.  
• Not a representative sample: heavily white, middle to upper class, etc.  
• As a non-autistic individual without an ID, I do not share this lived experience and thus, lack the full extent to grasp the complexity of these inquiries.

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• Intellectual disability (ID) is prevalent among the autistic community

• Most magnetic resonance imaging (MRI) studies lack representation, which means these individuals are excluded in current literature

Standard IQ assessment bias:
• created to fit a privileged non-autistic norm.

• UC Davis Autism Phenome Project (APP)
OBJECTIVE

• Analyze the demographic characteristics of autistic children with ID (FSIQ≤70) and without ID (FSIQ>70):
  - race/ethnicity
  - parental education
  - parental socioeconomic status
  - MRI scan-ability

• Explore if FSIQ scores differ across these demographics

• Assess if autistic children with ID are too challenging to obtain an MRI scan
METHODS

Participants

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Total Autistic Children</th>
<th>Autistic Children w/ ID</th>
<th>Autistic Children w/o ID</th>
<th>Age Range (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>383</td>
<td>269</td>
<td>114</td>
<td>1.5 - 4.5</td>
</tr>
<tr>
<td>3</td>
<td>177</td>
<td>114</td>
<td>63</td>
<td>4.5 - 9.5</td>
</tr>
<tr>
<td>4</td>
<td>122</td>
<td>73</td>
<td>49</td>
<td>9 - 14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Racial Identity/Ethnicity</th>
<th>Time 1</th>
<th>Asian</th>
<th>Black or African American</th>
<th>Hispanic/Latino</th>
<th>Other</th>
<th>Two or more races</th>
<th>White/European Caucasian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>32</td>
<td>11</td>
<td>64</td>
<td>8</td>
<td>80</td>
<td>188</td>
<td></td>
</tr>
</tbody>
</table>

Information Collection

- Demographic characteristics
- Intellectual ability
- MRI Scan Procedure

Analyses

- Group differences between autistic children with and without ID FSIQs were assessed for: race/ethnicity, SES, maternal and paternal education, and MRI scan ability.
RESULTS

Intellectual Ability Does Not Differ Among Racial Identity/Ethnicity Groups at T1

Regarding Awake MRI Scan Ability at T4
RESULTS

Intellectual Ability Does Not Differ Among Parental Education Level

![Box plot showing that intellectual ability does not differ among parental annual income levels.](image-url)
CONCLUSION

Ultimately, MRI autism research should include children with ID.

Future research to explore:
- the normative prejudice of IQ assessments
- the impact of intersectional marginalization, stress, and reduced resources on autistic children's intellectual development as well as their well-being

Thank you for your time.

This research would not have been possible without the support of Dr. Nordahl, Dr. Lee, Dr. Belcher, Dr. Van Eck, Dr. Linder, Dr. Heath, Ms. Acosta, Ms. Heckers, Ms. Hechtman, Mr. Clement, and the APP/GAIN research team for their constant guidance and care in my research.
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