Birth Order and Adaptive Functioning in Clinic-Referred Youth

Rosenthal, L.H.[1], Keifer, C.M. [1], McPartland, J.C. [1]
[1] Yale Child Study Center, Yale University School of Medicine

Background

- Neurodevelopmental disorders (NDDs) are a diagnostic group of conditions with childhood onset that produce impairments in functioning (DSM-5). NDDs include autism, intellectual disability, ADHD, and learning disorders.
- Sibling relationships can influence individual development, but they vary based on family dynamics.[1]
- Having a neurotypical sibling has a positive effect on adaptive functioning in autistic children, however, few studies have considered autistic children who have siblings with NDDs.[2,3]
- One such study found that autistic sibling dyads had significantly higher adaptive functioning scores than autistic children without an autistic sibling. This study did not account for IQ in analyses or include siblings with other NDDs.[4]
- Results of a similar study of autistic children with autistic or neurotypical sibling(s)[5] indicated that IQ was associated with adaptive functioning skills, suggesting that it should be considered in analyses for future research.

Purpose

The current study aimed to examine the relationships among adaptive functioning (AF), birth order (BO), sibling diagnosis, and IQ in youth referred to a developmental disabilities assessment clinic. This study builds on past research by including siblings with a variety of NDDs, medical conditions, and mental health diagnoses. It was predicted that later birth order would be associated with higher adaptive functioning skills due the influence of older siblings on development. It was also predicted that having a sibling with an NDD would be associated with lower adaptive functioning skills.

Methods & Approach

PARTICIPANT CHARACTERISTICS

- Participants included 179 children (M_{age}=7.96 $\pm$ 3.6 years) referred to a developmental disabilities clinic between 2003-2012. Assessments were individualized to each child's unique needs and presentation.
- Participants received a range of diagnoses, including autism, PDD-NOS, learning disabilities, and externalizing and internalizing disorders (Figure 1).

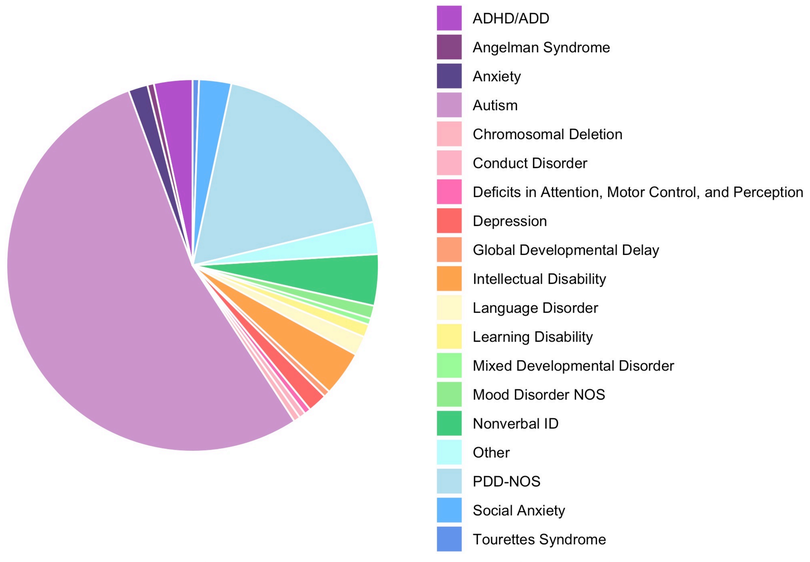

Figure 1. Each child's diagnoses within the sample of clinic-referred youth.

Methods & Approach

Table 1. Participant demographics; presented as Mean (Standard Deviation)

Birth Order	N	Age in Years	FSIQ	Sibling with NDD (N)
1	110	7.70 (3.58)	95.72 (24.80)	18
2	52	8.03 (3.35)	83.03 (23.20)	18
3	13	9.15 (4.59)	71.00 (25.46)	4
4	4	10.50 (3.42)	76.75 (40.10)	1

MEASURES AND BEHAVIORAL ASSESSMENTS

- All participants completed an IQ assessment (M_{IQ}=89.82 $\pm$ 25.8).
- Parents completed the Vineland Adaptive Behavior Scales (VABS), a comprehensive parent interview measuring adaptive functioning, including communication, daily living, and social skills.
- Parents also completed a demographic questionnaire that included questions on birth order and sibling diagnoses.

STATISTICAL ANALYSIS

- Linear regression models were performed to analyze the relationship between BO and AF with and without controlling for IQ. T-tests compared AF scores and sibling diagnosis.

Results

- AF scores were significantly associated with BO when the models did not include IQ. All domains (overall AF, daily living skills, communication skills, and social skills) had a negative association with BO (Figure 2).

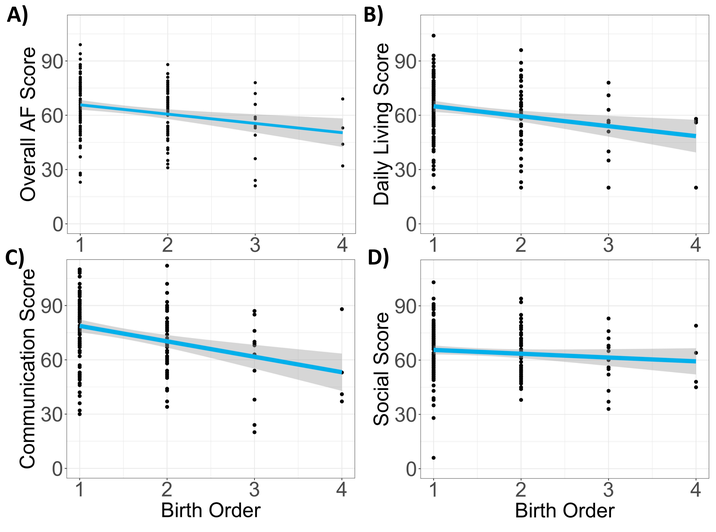

Figure 2. A) Higher overall AF scores were associated with higher BO (*B*=-5.13, *SE*=1.53, p=0.001). ***B)*** Stronger daily living skills were associated with higher BO (*B*=-5.50, *SE*=1.75, p=0.001). ***C)*** Stronger communication skills were associated with higher BO (*B*=-8.53, *SE*=2.00, p= 3.4e-5). ***D)*** Better social skills were weakly associated with higher BO (*B*=-2.103, *SE*=1.41, p=0.138).

- When including IQ in the model, BO negatively predicted AF in the communication domain (*B*=-3.38, *SE*=1.65, p=0.042). All other domains were not significantly predicted by BO: overall AF (*B*=-1.84, *SE*=1.38, p=0.183), daily living (*B*=-2.10, *SE*=1.62, p=0.199, social (*B*=-0.12, *SE*=1.39, p=0.929). IQ was the main driving factor in each model (p<0.05).

Results

- Differences in AF scores were not observed across all AF domains (Figure 3).

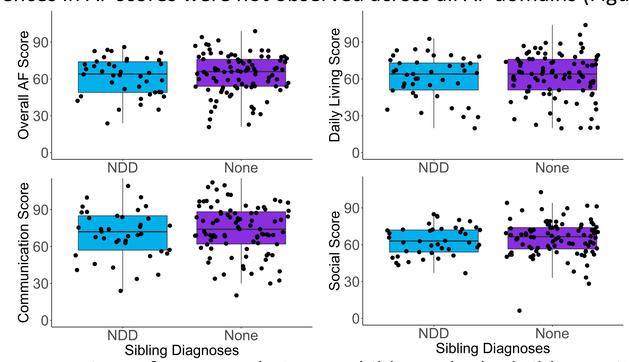

Figure 3. Comparison of AF scores between children who had siblings with an NDD or no diagnoses. No differences in overall AF scores (t(81.2)=0.61, p=0.53), daily living scores (t(81.1)=0.41, p=0.67), communication scores (t(71.74)=0.40, p=0.68), and social scores (t(91.63)=0.81, p=0.41).

Conclusions & Impact

- Later birth order was associated with weaker communication skills but unrelated to other aspects of adaptive functioning when accounting for IQ, indicating that cognitive abilities may be more influential on social and daily living skills. Furthermore, family dynamics like birth order may play an influential role in children's communication skills.
- These results contrast with a previous study[5] such that in the current study, communication skills were associated with birth order while controlling for IQ.
- Adaptive functioning did not differ by sibling diagnosis when comparing children who had siblings with an NDD and those with siblings without any psychiatric, medical, or NDD diagnoses. This differs from prior research conducted in autistic sibling dyads[4], but may be due to differences in diagnostic populations across studies. The current study included children with a variety of diagnoses and siblings with other NDDs besides autism.
- While using a sample of clinic-referred youth increased in the inclusivity in research, this diversity of diagnoses increased the heterogeneity in AF scores.
- Future research should consider differences in diagnosis, service use, and financial resources as these may all impact a child's communication skills.

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McPartland Lab
mcp-lab.org
mcp.lab@yale.edu