

Bridging the Research to Practice Gap with Knowledge of Transition Predictors for High School Students with Autism

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Agenda

- Introductions
- Project Autism Transition to Adulthood Initiative (ATTAIN)
- Predictors of Postschool Success
- Current Outcomes for Youth with Autism
- ATTAIN Research
- Conclusion & Next Steps

Our Research Team



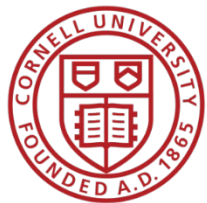
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Pause

Autistic v. Person with Autism

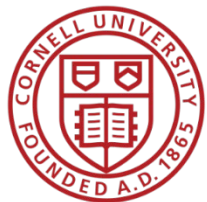
Our Work

Autism Transition to Adulthood Initiative (ATTAIN): A multi-year research project led by researchers at Cornell University's Yang Tan Institute on Employment and Disability.

Purpose of ATTAIN: To help improve post-school outcomes for young adults with autism through identifying predictors of obtaining a job, pursuing college/university, or living on one's own (or with roommates) after high school.

The logo for ATTain, featuring the word "ATTain" in a blue, rounded, sans-serif font. The letters "A", "T", and "T" are in a darker blue, while "a", "i", and "n" are in a lighter blue. The letters are slightly shadowed to give a 3D effect.

<https://autismtransitiontoadulthood.org/>



Predictors of Post-School Success

In-school experiences correlated with improved
post-school outcomes

23 Predictors for Students with Disabilities

Policy

- Inclusion in Gen Ed
- Exit Exam Req./ HS Diploma Status
- Program of Study

Student Skills

- Community Experiences
- Decision-Making
- Goal Setting
- Psychological Empowerment
- Self-Advocacy/Self-Determination
- Self-Care/Independent Living
- Self-Realization
- Social Skills
- Technology Skills
- Travel Skills

Career Development

- Career Awareness
- Career Technical Education
- Occupational Courses
- Paid Employment/Work Experience
- Work Study

Collaborative Systems

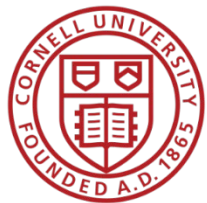
- Interagency Collaboration
- Parent Expectations
- Parental Involvement
- Student Support
- Transition Program

Why Investigate Predictors?

Predictor research can help inform and strengthen transition programs and practices in secondary education by pinpointing which in-school experiences have been linked to participating in education, employment, independent living, or other desired outcome areas (Rowe et al., 2015)

Frequently Researched Outcomes

- **Higher education:** being enrolled full- or part-time in community college (2-year program) or college/university (4- or more year program), and completing 1 term (IDEA, 2004)
- **Competitive employment:** work for pay at or above the minimum wage for 20 hours a week (90 days in the year since leaving high school), with customary pay rate, benefits, and opportunities for advancement as those without disabilities; the setting is with others who are nondisabled (IDEA, 2004)
- **Independent living *philosophy*:** “emphasizes consumer control... having crucial and valuable perspective to contribute, and deserving of equal opportunity to decide how to live, work, and take part in their communities...” (National Council on Independent Living, 2020, para. 11)



Why does our work focus on predictors of post-school success **for youth with autism?**

Current Issues

- People with autism often experience prejudice, discrimination, and other forms of societal stigma.
- Myths and misconceptions about their job performance, productivity, and safety (Scott et al., 2017; Solomon 2020; Unger et al., 2002)
- Some people with autism may exhibit certain behaviors (like avoiding eye contact or repetitive movements) that others may interpret as problematic and can affect securing a job or achieving other postsecondary goals.

Postsecondary Outcome Facts

- **Fewer than 60%** of young adults, ages 21-25, with autism work in paid employment, outside the household. (Roux et al., 2015)
- People with autism are **less likely** to live on their own leaving high school compared to people with other disabilities. (Anderson et al., 2013)
- **Only 36%** of high school graduates with autism have attended any form of postsecondary education (such as college or university) before their early 20s compared to more than 60 percent of all high school graduates. (Roux et al., 2015)

Gap in the Literature for People with Autism

Researchers, policy makers, and practitioners have taken greater interest in understanding what in school experiences predict positive transition outcomes.



Yet, in spite of this growing body of research targeting youth with disabilities, more generally, little is known about which in school experiences promote better outcomes for those with autism.

Test et al. (2009)

- Systematic literature review
- 1984 – March 2009
- Identified 16 predictors across 22 studies
- Only 4 of the 22 studies included, or may have included, students with autism, where this population accounted for 1% or less of their total samples

Haber et al. (2016) & Mazzotti et al. (2016)

Haber et al. (2016)

- Meta-analysis
- Assessed the strength of Test et al.'s (2009) predictors & updated literature to May 2010
- Included 36 studies
- **Limited evidence indicating whether predictors can be applied directly to the autism population**

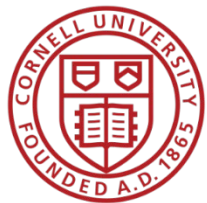
Mazzotti et al. (2016)

- Systematic Literature Review, 2009 – 2014
- Targeted studies conducting secondary analyses of the National Longitudinal Transition Study-2 (NLTS-2)
- Identified four new predictors based on 11 included studies
- **4 studies included autistic students with other disabilities, 2 autism only, 1 unclear**

Mazzotti et al. (2021)

- Systematic literature review
- 2009 – Jan. 2019
- 22 included studies
- 3 studies included students with autism among other disabilities, 5 exclusively targeted students with autism, and 1 was unclear whether autistic students were included

Predictor	Employment	Education	Ind. Living
Career Awareness	yes	yes	no
Career Technical Education	yes	no	no
Community Experiences	no	no	no
Exit Exam Requirements/ High School Diploma Status	no	no	no
Goal-Setting	no	yes	no
Inclusion in General Education	no	yes	no
Interagency Collaboration	yes	no	no
Occupational Courses	no	no	no
Paid Employment/ Work Experience	yes	no	no
Parent Expectations	yes	yes	yes
Parental Involvement	no	no	no
Program of Study	no	no	no
Psychological empowerment	no	yes	no
Self-Care/ Independent Living	yes	yes	no
Self-determination/Self-advocacy	yes	yes	no
Self-realization	no	no	no
Social Skills	yes	yes	no
Student Support	no	no	no
Technology Skills	no	no	no
Transition Program	yes	yes	no
Travel Skills	yes	no	no
Work Study	yes	no	no
Youth Autonomy/Decision-Making	yes	yes	no
Total # of Predictors	12	10	1



Our Research Question: What We Want to Know...

Do the known predictors of successful transition to adulthood for youth with disabilities also apply to youth with autism?

Our Timeline for Data Collection & Analysis

Year	Project Task	Description
1	Analysis of Existing PROMISE Data	Use rigorous research methods to analyze existing data from New York State PROMISE (Promoting the Readiness of Minors in Supplemental Security Income), a federally sponsored research initiative focused on removing obstacles to adult success for youth who receive Supplemental Security Income.
2	PROMISE Follow-Up Survey	Create and administer a new survey for young adults who participated in PROMISE to better understand what predictors they experienced in high school and their outcomes now. Analyze survey data using rigorous research methods.
3	Longitudinal Nationally-Representative Survey	Create and administer a nationally-representative longitudinal survey to better understand predictors of different outcomes for youth with autism. Analyze survey data using rigorous research methods.

Year 3 Sample: Where does it come from?

- Ipsos KnowledgePanel conducted a survey to obtain a representative sample for the US
- U.S. Postal Service Delivery Data is used to stratify and then randomly select panelists
- Additional recruiting is conducted to build KnowledgePanel Latino
- Total panel contains 60,000 members, age 13 and up
- Survey responses are weighted by gender \times age, race/ethnicity, census region, education level, household income, and language proficiency
 - Weighting enables us to better generalize to the larger population

Year 3: Who was in our study?

- Household members of adult, no primary survey respondents
 - 0.67% are age 15-17 years
 - 1.46% are age 18-30 years
- Total number of participants: 272
- Average age for participants is 29.16 years (SD = 14.46)
 - Range is 15 to 84 years

Participant Characteristics	Unweighted		Weighted	
	n	%	n	%
<i>Observations</i>	272	100	10,880.0	100
Adult	174	64.0	7,366.5	67.7
Youth	98	36.0	3,513.6	32.3
Spanish survey takers	8	2.9	341.7	3.1
Race/Ethnicity				
African American	16	5.9	967.6	8.9
Hispanic or Latino	47	17.3	1,901.7	17.5
Multiple	19	7.0	549.4	5.0
White	157	57.7	5,829.7	53.6
Other, Non-Hispanic	33	12.1	1,631.8	15.0
Sex				
Male	152	55.9	6,649.5	61.1
Female	120	44.1	4,230.5	38.9

Year 3: Education Outcomes (n = 272)

Outcomes	Weighted
In School	21.2%
HS Diploma or GED	56.3%
Attended 2-yr vocational/business/technical school	15.2%
Completed 2-yr vocational/business/technical school	13.0%
Attended 2-yr junior/community college	17.4%
Completed 2-yr junior/community college	10.7%
Attended 4-yr college or university	18.4%
Completed 4-yr college or university	12.5%

Year 3: Employment Outcomes (n = 272)

Outcomes	Weighted
Have paid job	38.9%
Ever employed	50.8%
Have worked	n/a
Part-time (< 35 hours/week)	22.8%
Full-time (> 35 hours/week)	29.2%
Joined military/armed forces	4.8%
Volunteered	44.0%

Year 3: Independent Living Outcomes

Outcomes	Weighted
Pregnancy (self or partner)	15.5%
Arrested	11.1%
Convicted or Adjudicated	5.7%
Family Caregiver	18.4%
Fallen in Love	43.4%
Got Married	18.5%
Moved into Own Home	23.9%
Bought and House/Condo	17.5%

Year 3: Empirical Approach

- The aim of this work is to understand the effects of transition practices on postschool success for employment, education, and independent living activities
- We ran separate logistic regressions for each predictor and each outcome
- Results are reported as odds ratios
- Robust standard errors that are adjusted by weights for better inference to the US population
- Multiple Imputation by Chained Equations (van Buuren & Groothuis-Oudshoorn, 2011) in R was used to address missing data and analyzed in Stata 16

Year 3: Empirical Model

$$Y_i = \beta_0 + \beta_1 P_i + X_i \delta + \varepsilon_i$$

Model includes

- Y : Binary measure of outcomes for participant i
- P : Single predictor tested in this model
- X : Age, race/ethnicity, region, responses to functional capacity questions
- ε : Idiosyncratic error

β_1 is the estimate of the change in the odds of the outcome among participants with autism who did engage in predictor P

Understanding Odds

Goal: understand how likely youth with autism will experience different postschool outcomes based on in-school experiences.

- Flipping a coin has even odds, **Odds = 1**
- **Odds > 1** mean that there is a higher chance of success
 - E.g., having an out of school job, odds of later employment is 5.30
- **Odds < 1** mean that there is less of a chance of success
 - E.g., if a person is only in classes with students with disabilities, odds of finding a job is 0.25

High School Completion and Career Development

Predictor Variable	Odds
In-school job	2.25*
Out-of-school job	2.58**
Work outside house	3.84***
Enrolled in industry or professional certificate program	4.24*

Predictor Variable	Odds
Informational interview	2.55*
Instruction on career opt.	4.38***
Job pays > minimum wage	4.06***
Participated in career technical education	1.63***
Apply job skills learned in HS in the community	5.71***

* $p < .05$; ** $p < .01$; *** $p < .001$

High School Completion and Student Skills

Predictor Variable	Odds
Make friends, find hobbies after HS	3.25***
Live away from parents, guardians	4.96***
HS prepared me to set educational goals	1.48**
Make own decisions	0.75*
Technical skills	0.76*
Set goal to attend postsecondary education (2-4 year)	3.69**

* $p < .05$; ** $p < .01$; *** $p < .001$

High School Completion and Policy Predictors

With students who don't have disabilities

- In academic classes (Odds = 3.27^{***})
- In vocational classes (Odds = 2.40^{**})
- In elective classes (Odds = 3.26^{**})

* $p < .05$; ** $p < .01$; *** $p < .001$

High School Completion and Collaborative Systems

Predictor Variable	Odds
In last 12 months, received occupational, physical, speech and language, or other therapy	0.27*
Family involved in transition decisions	1.37*
Number of people who helped prepare person for life after HS	2.01*

* $p < .05$; ** $p < .01$; *** $p < .001$

Current Employment and Career Development

Predictor Variable	Odds
Worked for pay while in school	3.04*
Out of School jobs	7.18***
Enrolled in vocational, technical, business program	5.79*

Predictor Variable	Odds
CTE participation	2.55*
Resume writing	2.58*
In school, received instruction on career options	2.38*
Apply job skills learned in school in the community	3.54*

* $p < .05$; ** $p < .01$; *** $p < .001$

Current Employment and Student Skills

Predictor Variable	Odds	Predictor Variable	Odds
Live away from parent or guardian	2.67*	Comfortable speaking up to get services	1.70**
Choose how to spend money	1.78*	Control temper when arguing with peers	0.70*
HS prepared me to set educational goals	1.67**	Attend postsecondary education (2-4 year)	9.87*
HS prepared me to set postschool goals	1.55*		

* $p < .05$; ** $p < .01$; *** $p < .001$

Current Employment and Other Predictors

- Only significant Policy predictor was all classes with students with disabilities (Odds = 0.16^{**})
- Only significant Collaborative System predictor was received occupational, physical or speech and language therapy in last 12 months (Odds = 0.17^{**})

* $p < .05$; ** $p < .01$; *** $p < .001$

Moved into own home and Predictors

Cluster	Variable	Odds
Career Development	CTE participation	0.24*
Career Development	Resume writing	4.66**
Student Skills	Make own decisions	1.60**
Student Skills	Control temper when arguing with peers	1.49*
Student Skills	In high school, got to places outside the home without help	0.63*

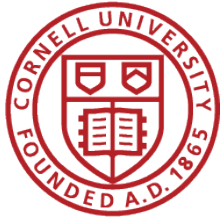
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Predictor	Employment	Education	Ind. Living
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Community Experiences	no	no	no
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Goal-Setting	no	yes	no
Inclusion in General Education	no	yes	no
Interagency Collaboration	yes	no	no
Occupational Courses	no	no	no
Paid Employment/ Work Experience	yes	no	no
Parent Expectations	yes	yes	yes
Parental Involvement	no	no	no
Program of Study	no	no	no
Psychological empowerment	no	yes	no
Self-Care/ Independent Living	yes	yes	no
Self-determination/Self-advocacy	yes	yes	no
Self-realization	no	no	no
Social Skills	yes	yes	no
Student Support	no	no	no
Technology Skills	no	no	no
Transition Program	yes	yes	no
Travel Skills	yes	no	no
Work Study	yes	no	no
Youth Autonomy/Decision-Making	yes	yes	no
Total # of Predictors	12	10	1

Predictor	Employment	Education	Ind. Living
Career Awareness	yes	yes	no
Career Technical Education	yes	yes (new)	no
Community Experiences	yes (new)	yes (new)	no
Exit Exam Requirements/ High School Diploma Status	no	no	no
Goal-Setting	yes (new)	yes	yes (new)
Inclusion in General Education	yes (new)	yes	no
Interagency Collaboration	yes	yes (new)	no
Occupational Courses	yes (new)	no	yes (new)
Paid Employment/ Work Experience	yes	yes (new)	no
Parent Expectations	yes	yes	yes
Parental Involvement	yes (new)	yes (new)	no
Program of Study	no	no	no
Psychological empowerment	no	yes	yes (new)
Self-Care/ Independent Living	yes	yes	no
Self-determination/Self-advocacy	yes	yes	no
Self-realization	yes (new)	no	no
Social Skills	yes	yes	yes (new)
Student Support	yes (new)	yes (new)	no
Technology Skills	yes (new)	yes (new)	no
Transition Program	yes	yes	no
Travel Skills	yes	no	yes (new)
Work Study	yes	no	no
Youth Autonomy/Decision-Making	yes	yes	no
Updated Total # of Predictors	20	17	6

Conclusion of our Findings

- 10 predictors were related to 2 outcomes
- Aside from employment in HS, these predictors were (cor)related to both employment and education
 - Applied skills learned in HS to community (+)
 - Lived away from parent or guardian (+)
 - Services from occupational, physical, speech and language, or other therapy (-)
 - Received instruction to assess career options (+)



<https://autismtransitiontoadulthood.org/>

Thank you for your time.

If you have any questions, please contact Leslie Shaw at leslie.shaw@cornell.edu

Please visit our social media accounts for updates on our research!

- **Twitter:** <https://twitter.com/AutismATTAIN>
- **Facebook:** ATTAIN-Autism Transition to Adulthood Initiative