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Self-Determination in Autistic Transition-Aged Youth without Intellectual Disability

Brianne Tomaszewski[1], **Laura Klinger**[1], **Cara E. Pugliese**[2,3]

[1]TEACCH Autism Program, Department of Psychiatry, University of North Carolina at Chapel Hill

[2]Center for Autism Spectrum Disorders, Children's Research Institute, Children's National Hospital

[3]Department of Psychiatry, Behavioral Sciences, & Pediatrics, The George Washington University School of Medicine

Abstract

Self-determination refers to an individual's capacity and opportunities to act as a causal agent in their own lives to make choices, decisions, and set goals. The current study examined self- and parent-reports of the AIR Self-Determination Scale in transition-aged autistic youth[1]. Autistic youth completed depression and executive function measures, and parents rated their child's social-communication and executive function difficulties. Despite differences between youth and parent reports, both youth and their parents reported lower self-determination skills (capacity) than opportunities to practice self-determined behaviors. Both depression and executive function skills were related to self-determination capacity, highlighting potential intervention targets for transition-aged youth to facilitate increased self-determination and potentially improved adult outcomes.

Keywords

Autism; self-determination; transition; executive function; adolescence; young adult

The prevalence rate of autism has increased 150% in the first two decades of the 21st century, with the fastest growing subgroup including individuals without co-occurring intellectual disability (ID; Maenner et al., 2020). Within this group, compromising 2/3 of individuals on the autism spectrum, there is an expectation of positive outcomes based on relatively higher cognitive and linguistic abilities. However, longitudinal studies have not generally found more favorable outcomes in this group (Howlin, 2003). As few as 9% of autistic adults without ID reach functional independence, only 9% remain consistently employed in full-time competitive positions compared to 90–96% of the general U.S. population, and most remain employed in entry-level jobs (Baio et al., 2018; Christensen et al., 2016; Henninger & Taylor, 2012; Roux et al., 2015; Shattuck et al., 2012; Taylor &

[1]Based on stakeholder preferences, we use identity-first(autistic) or neutral language (on the autism spectrum) (Bottema-Beutel et al., 2020)

Brianne Tomaszewski, Research Assistant Professor, TEACCH Autism Program, Department of Psychiatry, CB#7180, University of North Carolina at Chapel Hill, Chapel Hill NC 27599-7180. Brianne_Tomaszewski@med.unc.edu Phone: (919) 962-8563.

Mailick, 2014; Taylor & Seltzer, 2011). Compared to autistic adults with ID, autistic adults without ID are three times more likely to have no daytime activities of any kind (Taylor & Selzer, 2011). The high rates of unemployment and educational and vocational disruptions (Chan et al., 2017; Taylor & DaWalt, 2017) are associated with a per-person cost of $50319 per year for autistic adults without ID (Buescher et al., 2014).

Despite these poor outcomes, autistic youth without ID experience a steep decline in services that begins during high school and continues into the post-secondary time period. (Laxman et al., 2019). This loss of services is often characterized as ““falling over a cliff.”“ When asked about specific transition support needs, caregivers of autistic adults report that during high school, the curriculum focuses on academics, but not on ““soft”“ skills that are critical for transition success, including independent living skills, self-determination, and preparedness for employment or post-secondary education (Anderson & Butt, 2018; Matthews et al., 2021; Snell-Rood et al., 2020). The lack of support for specific skills associated with a successful transition to adulthood has posed a significant problem for autistic youth who commonly struggle with independent living skills and self-advocacy (Gillespie-Lynch et al., 2017; Pugliese et al., 2015; Pugliese et al., 2016; Shogren & Plotner, 2012; Van Hees et al., 2015). Thus, there is a critical need to study and identify potential intervention targets for autistic youth without ID to promote successful adult outcomes.

Self-determination is one potential intervention target that has been highlighted as a significant predictor of positive outcomes in adolescence and adulthood for individuals with disabilities(Shogren et al., 2015; Shogren & Shaw, 2017) but has received less attention in autism research. Self-determination refers to a set of beliefs, knowledge, and skills (e.g., self-awareness, decision-making, goal setting) that enable someone to engage in self-directed behavior and pursue their own goals and desires in areas a person feels are important to them (Wehmeyer, 1998). Self-determination theory emphasizes the importance of providing individuals with the opportunity and support to practice self-determined behaviors in their environment (Wolman et al., 1994). Self-determination includes capacity and opportunity. Capacity refers to the knowledge, perception, and abilities that enable an individual to set desired goals, independently make choices and plans to pursue those goals, and self-awareness of goal progress. Opportunity refers to the chance to use their knowledge and abilities at home and school (Wolman et al., 1994). Much of the literature on self-determination comes from research on intellectual disabilities or learning disabilities. It suggests that higher self-determination has been linked to various positive school and adult outcomes (Wehmeyer et al., 2010). Increased self-determination is associated with higher academic achievement in high school students with disabilities (Gaumer Erickson et al., 2015; Zheng et al., 2014). Youth with disabilities and higher self-determination in high school have greater community access post-graduation, higher rates of enrollment and completion of post-secondary education, are more likely to be employed, make greater wages, have better quality social relationships, more financial supports, and advocacy, and have a higher quality of life than youth with disabilities with lower self-determination (Chao, 2018; Petcu et al., 2017; Shogren et al., 2015; Shogren & Shaw, 2017; Wehmeyer & Schwartz, 1997; Zalewska et al., 2016).

The small amount of prior research on self-determination in autistic adolescents and adults indicates that it is positively associated with quality of life (Kim, 2019; White et al., 2018). However, autistic adolescents have lower self-determination abilities than those with ID or learning disabilities (Chou et al., 2017; Kim, 2019; White et al., 2018). Studies that have combined autistic young adults with and without ID have reported that caregivers rated autistic young adults as having lower capacity than opportunities for making self-determined decisions (Cheak-Zamora et al., 2020; Tomaszewski et al., 2020). However, in contrast to the caregiver report, Tomaszewski and colleagues (2020) found that adolescents and young adults reported higher capacity levels. Given the central theoretical importance of the individual's perception in self-determination theory, it is critical to consider the youth's perspective. To date, no studies have examined predictors of self-reported self-determination in transition-aged youth on the autism spectrum without ID. Identification of malleable factors is essential to enhancing self-determination and downstream positive outcomes. We explore three significant predictors that may influence the ability to engage in self-determined behavior: social communication difficulties, executive function (EF) skills, and depressive symptoms.

Increased social-communication difficulties have been associated with reduced independence in autistic adults (Eaves & Ho, 2008; Howlin et al., 2004). Two studies in autistic adolescents and young adults have reported a significant association between caregiver and educator reports of social-communication difficulties and self-determination in combined samples of individuals with and without ID (Cheak-Zamora et al., 2019; Tomaszewski et al., 2020) with more social-communication difficulties associated with lower levels of self-determination. Similarly, teacher ratings of greater student self-determination abilities were correlated with greater social skills in adolescents with disabilities, more generally (Pierson et al., 2008). Thus, it is likely that greater social-communication difficulties may negatively impact self-determination in transition-aged autistic youth.

Higher order cognitive skills to manage goal-directed behavior and problem-solving have been theoretically linked to self-determination (Wehmeyer & Garner, 2003) and may be particularly relevant in autistic youth due to well-documented EF difficulties. EF abilities, including flexibility, working memory, organization, and planning, are impaired in individuals on the autism spectrum as reported by parents and teachers (Granader et al., 2014; Hill, 2004; Kenworthy et al., 2008) and as demonstrated in controlled clinical settings (Kenworthy et al., 2008; Kenworthy et al., 2005; Lai et al., 2017; Landry & Al-Taie, 2016; Pennington & Ozonoff, 1996). Impaired EF has been linked to problems in areas that impact health, well-being, and independence in autistic adolescents and adults, including poor academic achievement (Pellicano et al., 2017; St. John et al., 2018) and adaptive behavior (Gardiner & Iarocci, 2018; Pugliese et al., 2015; Pugliese et al., 2016; Wallace et al., 2016). Thus, it is likely that impaired executive function may negatively impact self-determination in transition-aged autistic youth.

It is also possible that co-occurring mental health disorders, such as depression may be associated with reduced self-determination (Capriola-Hall et al., 2021). There are high rates of co-occurring depression in adolescents and adults on the autism spectrum (Cederlund et

al., 2010; Hill et al., 2004; Taylor & Gotham, 2016), with a recent meta-analysis estimating a 37% lifetime prevalence rate of depression in autistic adults (Hollocks et al., 2019). Autistic adolescents and young adults also show higher depressive symptoms than those with other developmental disabilities (Gotham et al., 2015) and students without autism (Zuckerman et al., 2018). To our knowledge, the relationship between depression and self-determination has been examined in only one study in transition-aged youth (Capriola-Hall et al., 2021). A significant, negative association ($r = -.52$) was reported between depression and self-determination. Thus, it is likely that depression may negatively impact self-determination in transition-aged autistic youth.

The purpose of the present study is to characterize self-determination for transition-aged autistic youth without ID from both the youth and parent perspective and explore mutable factors associated with its development. Specifically, we aimed to:

1. Compare student and parent perceptions of self-determination skills (i.e., capacity) and opportunities to practice self-determination in the home and school environment.
2. Explore the associations of age, IQ, social- communication difficulties, EF, and depression with youth- and parent-report of self-determination using structural equation modeling.

Methods

IRB approval was obtained from the University of North Carolina at Chapel Hill and Children's Research Institute and from participating school districts and community colleges. Participants under 18 provided assent, and their parents provided consent to participate. Participants 18 or older were asked specific structured questions to ensure capacity for consent.

Participants

Participants included 237 autistic transition-aged youth aged 14–21 (M= 18.36, SD= 1.64) and a subsample of their 198 parents and caregivers who completed self-determination measures. Participants were drawn from two different clinical trials studies examining the efficacy of transition to adulthood intervention programs across two different research teams. in the eastern United States. Participants were recruited from local high school transition fairs, high schools, community colleges, vocational rehabilitation services, and local clinics providing services to individuals on the autism spectrum. Inclusion criteria were: 1) being transition age between 14–21 years, 2) a diagnosis of autism, including an educational diagnosis (as documented by a high school IEP) or a vocational rehabilitation diagnosis (as documented by either a previous IEP or a psychological evaluation within the past three years), 3) average or higher intellectual skills and language skills as evidenced by completion or in the process of completing a standard high school diploma, and 4) current enrollment in high school or community college. Adolescents and young adults on the autism spectrum were predominately male (76%) and White (71%). All assessments were conducted before participation in an intervention. Participants completed questionnaires and

direct assessments as part of a larger battery of assessments during the baseline visit to the intervention study.

The majority of measures were consistent across studies warranting a combination of baseline assessments to address questions regarding self-determination. However, there are some differences among sites, as noted below. A subset of participants (n=106) completed the Wechsler Abbreviated Scales of Intelligence Full-Scale IQ or Brief Full-Scale IQ (WASI-II FSIQ-4 or FSIQ-2; Wechsler, 2011) to confirm an IQ score of >80 from both sites. Participants were excluded if they received a prior diagnosis of ID.

Measures

Self-determination—The AIR Self-Determination Scale (AIR-SDS; Wolman et al., 1994) was developed to measure school-age students' self-determination across two subdomains: Capacity and Opportunity. The Capacity domain measures the student's knowledge, abilities, and perceptions that enable youth to become self-determined. The Opportunity domain measures youth's chances to apply their knowledge and abilities related to self-determination at home and school. Items are rated on a 5-point scale from "Never" to "Always," with higher scores indicating greater self-determination. The AIR-SDS Student Form and Parent Forms were used in the current study.

The AIR-SDS student form is a 24-item scale measuring Capacity (12 items), Opportunity at School (6 items), and Opportunity at Home (6 items). The Capacity (Cronbach's α = .89), Opportunities at Home (Cronbach's α = .86), Opportunities at school (Cronbach's α = .86), and overall self-determination items, (Cronbach's α = .91) demonstrated high internal consistency in the current sample. See Table 1 for item examples.

The AIR-SDS parent form has 18 items that parallel the student form, but the Capacity scale only contains six items assessing their child's abilities related to self-determination. The parent form Capacity (Cronbach's α = .85), Opportunity at School (Cronbach's α = .88), Opportunity at Home (Cronbach's α = .79), and overall self-determination items (Cronbach's α = .87) demonstrated high internal consistency (see Table 1 for example items) in the current sample. The Level of Self-Determination is calculated by dividing the sum by the total possible sum and multiplying by 100, with a maximum score of 100. The self-determination level was used to compare student and parent reports directly due to the different items. This measure was collected at both sites.

Social-Communication Difficulties—Parents or caregivers completed the Social Responsiveness Scale-2nd edition School-Age or Adult Form (SRS-2; Constantino, 2012). The SRS-2 is a 65-item measure of social-communication difficulties, with higher *T*-scores indicating greater social-communication difficulties. The School-Age Form is designed for ages 4 to 18, and the Adult form is designed for ages 19 to 89 years, and there is considerable overlap between the two forms. The SRS-2 was standardized with a large representative, a sample of 1,014 children and 1,602 adults, and demonstrated strong internal consistency (.94 to .96; Constantino, 2012). The total T-Score was used in the current sample (Cronbach's alpha = .78). The School-Age form was used at one site, and the Adult Form was used at the second site. The SRS-2 School Report and Adult both have 65 items

with slight wording changes and more appropriate items for adult contexts (i.e., separates easily from caregivers in SRS-2 School Age was replaced with enjoys and is competent with small talk (casual conversation with others). The authors and the user manual recommend using the SRS-2 across the lifespan.

Executive function—Parent/caregiver-report of EF was measured using the Behavior Rating Inventory of Executive Function-2nd edition (BRIEF-2; Gioia et al., 2015)) or the Behavior Rating Inventory of Executive Function, Adult Form (BRIEF-A; Roth et al., 2004). The BRIEF-2 and BRIEF-A are informant report questionnaires that assess EF abilities' behavioral manifestation in school-aged children (ages 5 to 18; BRIEF-2) and adults (ages 18 to 90; BRIEF-A). The BRIEF-2 was used at one site, and the BRIEF-A was used at the second site. For both versions, items are summed to create an overall Global Executive Composite (GEC) *T*-score, with higher scores indicating more significant EF difficulties. The BRIEF-2 and BRIEF-A standardization samples included nationally representative samples of 3,603 children and 1,136 adults. The BRIEF-2 and BRIEF-A have demonstrated acceptable reliability and validity as an ecologically sensitive EF measure (Gioia et al., 2015; Roth et al., 2005). The BRIEF- A (Cronbach's alpha = .96) and BRIEF-2 (Cronbach's alpha= 0.90) demonstrated excellent internal consistency in the current sample. A subset of adolescents with ASD (n=47) completed the BRIEF-2 Self-Report form (Gioia et al., 2015). The Self-Report form examines EF difficulties in individuals ages 11–18. The BRIEF-2 Self-Report has demonstrated reliability and validity in clinical and non-clinical samples(Gioia et al., 2015). The GEC is on the same scale for all three BRIEF versions; thus, the GEC was used in the current analysis.

Depression—Autistic youth completed the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) or the Center for Epidemiologic Studies Depression Scale-Revised (CESD-R; (Eaton et al., 2004), depending on site. The CESD and CESD-R are widely used measures of depression. Individuals rate the frequency of their depression symptoms from 0 *(not at all)* to 3 (*5–7 days/nearly every day*). Both CESD and CESD-R have demonstrated high internal consistency and validity (Eaton et al., 2004; Van Dam & Earleywine, 2011). CESD-R scores were converted to the same range as CESD overall scores across 20 questions for a range of possible scores between 0 and 60, with higher scores indicating more significant depressive symptoms as recommended by the authors (Eaton et al., 2004). Individuals with a total score of 16 or above are considered to have clinically significant depression scores (Eaton et al., 2004).

Missing Data

There was missingness across the sample from the two clinical sites. Participants completed student-reported EF (N=47) from one site and a subset of participants completed IQ measures from both sites (N=106). There was missinginess for student-reported self-determination (N=230), parent-reported self-determination (N=195), social communication difficulties (N=224), parent=reported EF (N=219), and student-reported depression (N= 214). Data from self-determination, social communication difficulties, parent-reported EF, and self-reported depression were assumed to be missing at random (MAR) or that the missingness is due to the observed variables (Enders, 2003; Little & Rubin, 2020).

Missing data were handled in data analysis using Multiple Imputation and Full Information Maximum Likelihood as described below.

Data Analysis Plan

To characterize and compare youth and parent self-determination, repeated-measured ANOVAs were conducted using IBM SPSS Statistics, version 28 for youth and parents. Multiple imputation was used to address missing data. Data were imputed across 18 datasets to address the 18% of missing data from the parent reports of self-determination. Multiple imputation estimates a set of values for the missing data based on the observed data. Data is analyzed across the 18 datasets to derive a set of unbiased parameter estimates (White et al., 2011). Between-group differences and within-individual profiles of self-determination were examined for self-determination domains.

Analyses exploring predictors of self-determination were conducted in MPlus Version 8 using structural equation modeling (Muthén & Muthén, 1998–2017). The first step in structural equation modeling is to confirm the measurement model, or the factor structure, of the scale before adding in predictors. A confirmatory factor analysis was conducted to examine the factor structure of the AIR-Self-Determination Scale Student Report and Parent Report forms with robust weighted least squares estimators (WLSMV). WLSMV is recommended for categorical indicators (Brown, 2006). Several indices of model fit were examined to determine the adequacy of the measurement models: $\chi^2/df < 3.00$, CFI and TFI > .90, and RMSEA and SMRM < .08 (Brown, 2006). Following validation of the measurement model, a structural equation model was performed to examine the extent to which age, IQ, parent-reported autism severity, parent and student-reported EF, and student-reported depression predicted self-determination. These variables were added as covariates to the final measurement models from the confirmatory factor analyses. Associations were examined among student and parent levels of self-determination to assess the concordance of student and parent forms. Full information maximum likelihood was used to address the missing data. Full information maximum likelihood is recommended rather than listwise deletion due to the production of less bias in parameters (Enders, 2010; Graham, 2009). Full information maximum likelihood uses all available information in the dataset to produce unbiased parameter estimates and standard errors (Enders, 2010).

Results

Student and Parent Self-Determination Levels

The overall repeated-measures ANOVA between parent and student reported domains of Capacity, Opportunity at Home, and Opportunity at School was statistically significant, $F(2, 419) = 86.51$, $p < .001$, $\eta^2 = .29$, indicating that youth-rated their self-determination skills differently than their parents. Students reported significantly higher self-determination capacity, more self-determination opportunities at home, and fewer self-determination opportunities at school than parents; (See Table 2).

The overall repeated-measure ANOVA for student report of self-determination was statistically significant, $F(2, 236) = 72.83$, $p < .001$, $\eta^2 = .39$. Post-hoc paired sample t-tests

indicated that students reported higher levels of opportunities to practice self-determined behavior at home than self-determination skills (capacity), t (236) = 10.81, $p < .001$, Cohen's d = .72, and self-determination opportunities at school, t(236) = 10.25, $p < .001$, Cohen's d= .68. Youth reported similar levels of capacity and opportunities at school, t(236) = .72, $p = .27$, Cohen's d = .04.

The overall repeated-measure ANOVA for parent report of self-determination was statistically significant, F (2, 236) = 163.24, p <.001, $\eta^2 = .73$. Parents reported that students had higher levels of opportunities to practice self-determined behavior at home, t (236) = 17.43, $p < .001$, Cohen's d =1.25, and school, school, t (236) = 17.75, $p < .001$, Cohen's d = 1.26, than they had skills to engage in those behaviors (capacity). Parents reported similar levels of self-determination opportunities at home than at school, t (236)= −.90, $p = .18$, Cohen's d = .07.

Predictors of Self-Determination

The first step of examining predictors of self-determination involved confirmatory factor analyses of the AIR-SDS Student Report and Parent Report. The hypothesized structural model of the AIR-SDS Student and Parent Reports did not fit the data well, χ^2 /df =1.99, RMSEA=.07 (90% CI [.06, .07]), CFI=.90, TLI=.89, SRMR = .08. Modification indices suggested an Opportunity at Home and an Opportunity at School item loaded onto the Capacity domain for student and parent reports. On both student and parent versions of the AIR-SDS, the Opportunity at Home and School scale items "[At School]…I have learned how to make plans to meet my goals and to feel good about them" also loaded onto the capacity domain. This item was also reported as loading onto both domains in the parent version of AIR-SDS in a larger sample of high school students across cognitive abilities on the autism spectrum (Tomaszewski et al., 2020). Students and parents rated this item lower on the opportunities at home domain than the other opportunities items. The measurement model fit indices demonstrated acceptable fit, χ^2 /df =1.56, RMSEA=.05 (90% CI [.04, .06), CFI=.94, TLI=.93, SRMR = .07. All item factor loadings were > .30. See Table 3 for item statistics.

Age, IQ, social-communication difficulties, EF, and depression were regressed onto the latent constructs of student capacity, student opportunities at school, student opportunities at home, parent capacity, parent opportunities at school, and parent opportunities at home in a structural equation model. The model demonstrated acceptable fit, χ^2 /df= 1.48, RMSEA=.05 (90% CI [.04, .05]), CFI=.94, TLI=.92, SRMR = 07. Lower student-reported depression (β= - .17, $p = .04$) and fewer student-reported EF problems (β = −.63, $p < .001$) were associated with greater student-reported capacity for self-determination. The model was also repeated without student-reported EF due to only 47 participants completing this measure. There were no significant differences in relationships among measures in the model.

Higher IQ scores were associated with greater parent-reported capacity (β = .28, $p = .02$). Lower parent-reported social-communication difficulties were associated with greater parent-reported self-determination capacity (β =−.30, p=.001). Fewer parent-reported EF problems were significantly associated with greater parent-reported capacity (β =

−.56, p <.001). Younger ages were significantly associated with greater parent-reported opportunities at home (β = −.18, p =.03).

There were no significant correlations between parent and student reports of opportunities at home. There was a small, significant association between student and parent reports of capacity (β = .20, p = .01) and opportunities at school (β = .17, p = .02). Student-reported depression was significantly associated with parent-reported social communication difficulties (β = .17, p = .03), parent-reported EF (β = .31, p < .001), and student reported-EF (β = .55, p <.001). Parent-reported EF was significantly associated with age (β = −.16, p = .03) and social communication difficulties (β= .43, p < .001).

Discussion

The purpose of the current study was to compare self-determination from perspectives of transition-aged youth with autism and their parents using the AIR Self-Determination Scale and examine associations among self-reported and parent-reported individual characteristics. First, we found evidence to suggest that ratings of self-determination capacity and opportunities to practice self-determined behaviors differ between autistic youth and their parents. Additionally, ratings on these domains were differentially distributed within each group, with skill level generally lagging opportunities for practice. Second, we demonstrated significant associations among social-communication challenges, EF, depression, and self-determination domains that differed depending on the reporter.

Autistic students reported higher self-determination capacity and higher levels of opportunity to practice self-determined behavior at home than their parents. Notably, students reported fewer opportunities to practice self-determined behavior at school than their parents. There was a small significant correlation between parent reports and self-reports of capacity. The lack of correlation finding is unsurprising, given that multi-informant reports typically only yield low-to-moderate levels of correspondence (i.e., r's ranging from .20 to .60; De Los Reyes et al., 2015). This lack of concordance between parent and self-reports in transition-aged autistic youth without co-occurring ID suggests the importance of gaining information from both youth and their parents in setting goals for the transition to independence.

While some studies suggest that we should take caution in self-reports due to these discrepancies (Mazefsky et al., 2011), self-determination involves the individual's causal agency, so it is critical to incorporate perspectives of autistic transition-aged youth. Despite differences in the mean-level report of self-determination capacity and opportunities and a lack of parent-child correlation on these domains, parents and youth both reported similar patterns across the AIR-SDS such that self-determination capacity was viewed as lower than the opportunities they had to practice self-determination skills at home; and that there were more opportunities to practice self-determination at home than at school. These findings suggest that while opportunities at home and school exist for students, they may need more support in skills surrounding explicit instruction in self-determination or activities that promote self-determination, emphasizing school-based supports. To date, one intervention incorporates explicit self-determination instruction in autistic youth without co-occurring ID

ages 16–25 (White et al., 2017, 2019). The STEPS program incorporates an explicit focus on self-determination through cognitive-behavioral strategies (White et al., 2017). Results showed that students with higher self-determination levels at baseline predicted increases in college adjustment intervention gains (White et al., 2019). These findings were preliminary due to small sample sizes and did not demonstrate a change in self-determination over time; thus, more research is needed to examine self-determination interventions for transition-aged youth on the autism spectrum.

Increased levels of depression and EF difficulties were associated with student-reported capacity but not opportunity, suggesting that depression and EF may contribute to lower capacity levels. In the current sample, 35% of participants met the criterion for a clinically significant depression score. Both depression and EF have been associated with adaptive behavior or outcomes related to daily living activities in autistic adolescent youth (Kraper et al., 2017; Pugliese et al., 2015;2016) and independence and well-being in adulthood (Wallace et al., 2016). Given that autistic youth are at risk for increased depression and EF difficulties, focusing on mental health and building strong foundational EF skills, such as teaching self-advocacy around EF challenges, may be essential for building self-determination skills. Interestingly, greater parent-reported EF difficulties were associated with decreased self-determination levels and fewer opportunities to practice self-determined behavior at home but more opportunities at school. The opposite pattern of opportunities at home and school may indicate the difference in how supports are viewed. For example, parents may rate fewer opportunities at home for students with increased EF difficulties because they have less capacity to act upon opportunities at home. Nevertheless, they may view the school as providing increased supports for their students due to their child having increased EF difficulties. Future research would be necessary to consider school context by including teacher or instructor reports of self-determination opportunities.

For autistic youth without co-occurring ID, the item surrounding making plans for goals was not clearly distinguished from the skill of self-determination or the opportunities provided to learn these skills. It may be that there need to be both learning opportunities and more explicit instruction in how to learn to make plans for goals for parents and educators. Research on goal planning in autistic transition-aged youth has suggested that clear post-school goals are essential for a successful transition to college or employment settings (Alverson et al., 2019; Wei et al., 2016). Autistic students currently in post-secondary education settings may also benefit from clear goal planning support during their experiences to promote a successful transition from post-secondary education to employment (Van Hees et al., 2015; Vincent, 2019).

This study is not without limitations. First, due to two separate samples, there were missing data on the BRIEF Self-Report and IQ measures. While data was estimated using FIML, which produces less biased parameters than case deletion, there was a larger percentage of missingness across predictor variables. Second, this study was cross-sectional, and longitudinal research is needed to explore these relationships over time to make inferences about causality among the variables. Third, we do not have a history of previous services received. Detailing the types and amounts of services received during transition will be critical when examining future studies' service use and intervention programs. Fourth, we

combined the use of the BRIEF-A and BRIEF-2, which has not been reported on previously. There is more validation work needed to justify the combination of these measures in future studies. Finally, there were no self-reported autism severity or parent-reported depression measures to examine all reporters' perspectives on these constructs.

The current study examined self-determination in autistic youth in high school and community colleges using student and parent-reports. There was a discrepancy between students and parents, with students reporting higher capacity and fewer opportunities at school. However, overall both students and parents reported that self-determination capacity lagged behind opportunities for engaging in self-determined behavior. For students, depression was strongly related to capacy suggesting that a focus on treating depression may support increased self-determination and potentially adult outcome. For caregivers, symptom severity and cognitive abilities (IQ and executive function) were most related to self-determination. Findings highlight the importance of gaining both the parent and student perspective and suggest that depression and executive function skills may be important intervention targets for transition aged youth in facilitating increased self-determination and potentially improved adult outcomes.

References

Alverson CY, Lindstrom LE, & Hirano KA (2019). High School to College: Transition Experiences of Young Adults With Autism. Focus on Autism and Other Developmental Disabilities, 34(1), 52–64. 10.1177/1088357615611880

Baio J, Wiggins L, Christensen DL, Maenner MJ, Daniels J, Warren Z, Kurzius-Spencer M, Zahorodny W, Robinson C, Rosenberg, White T, Durkin MS, Imm P, Nikolaou L, Yeargin-Allsopp M, Lee L-C, Harrington R, Lopez M, Fitzgerald RT, … Dowling NF (2018). Prevalence of Autism Spectrum Disorder Among Children Aged 8 Years — Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2014. MMWR. Surveillance Summaries. 10.15585/mmwr.ss6706a1

Bottema-Beutel K, Kapp SK, Lester JN, Sasson NJ, & Hand BN (2020). Avoiding Ableist Language: Suggestions for Autism Researchers. Autism in Adulthood, 00, aut.2020.0014. 10.1089/aut.2020.0014

Brown TA (2006). Confirmatory factor analysis for applied research. The Guilford Press.

Buescher AVS, Cidav Z, Knapp M, & Mandell DS (2014). Costs of autism spectrum disorders in the United Kingdom and the United States. JAMA Pediatrics. 10.1001/jamapediatrics.2014.210

Cederlund M, Hagberg B, & Gillberg C (2010). Asperger syndrome in adolescent and young adult males. Interview, self - and parent assessment of social, emotional, and cognitive problems. In Research in Developmental Disabilities (Vol. 31, Issue 2, pp. 287–298). Res Dev Disabil. 10.1016/j.ridd.2009.09.006 [PubMed: 19880274]

Chan W, Smith LE, Hong J, Greenberg JS, Lounds Taylor J, & Mailick MR (2017). Factors associated with sustained community employment among adults with autism and co-occurring intellectual disability. Autism, 136236131770376. 10.1177/1362361317703760

Chao P-C (2018). Using Self-Determination of Senior College Students with Disabilities to Predict Their Quality of Life One Year after Graduation. European Journal of Educational Research, 7(1), 1–8. 10.12973/eu-jer.7.1.1

Charach A, Dashti B, Carson P, Booker L, Lim CG, Lillie E, Yeung E, Ma J, Raina P, & Schachar R (2011). Attention Deficit Hyperactivity Disorder: Effectiveness of Treatment in At-Risk Preschoolers; Long-Term Effectiveness in All Ages; and Variability in Prevalence, Diagnosis, and Treatment. Agency for Healthcare Research and Quality.

Cheak-Zamora NC, Maurer-Batjer A, Malow BA, & Coleman A (2020). Self-determination in young adults with autism spectrum disorder. Autism, 24(3), 605–616. 10.1177/1362361319877329 [PubMed: 31561711]

Chou YC, Wehmeyer ML, Palmer SB, & Lee J (2017). Comparisons of Self-Determination among Students with Autism, Intellectual Disability, and Learning Disabilities: A Multivariate Analysis. Focus on Autism and Other Developmental Disabilities, 32(2), 124–134. 10.1177/1088357615625059

Christensen DL, Baio J, Braun KVN, Bilder D, Charles J, Constantino JN, Daniels J, Durkin MS, Fitzgerald RT, Kurzius-Spencer M, Lee L-C, Pettygrove S, Robinson C, Schulz E, Wells C, Wingate MS, Zahorodny W, & Yeargin-Allsopp M (2016). Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years - Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2012. Morbidity and Mortality Weekly Report. Surveillance Summaries (Washington, D.C. : 2002), 65(3), 1–23. 10.15585/mmwr.ss6503a1

Constantino JN (2012). Social Responsiveness Scale, Second Edition. Western Psychological Services.

Eaton WW, Muntaner C, Smith C, Tien A, & Ybarra M (2004). Center for Epidemiologic Studies Depression Scale: Review and revision (CESD and CESD-R). In The Use of Psychological Testing for Treatment Planning and Outcomes Assessment. (3rd ed., pp. 363–377). Lawrence Erlbaum.

Eaves LC, & Ho HH (2008). Young adult outcome of autism spectrum disorders. Journal of Autism and Developmental Disorders, 38(4), 739–747. 10.1007/s10803-007-0441-x [PubMed: 17764027]

Enders CK (2003) Using the Expectation Maximization Algorithm to Estimate Coefficient Alpha for Scales With Item-Level Missing Data. Psychological Methods, 8(3):322–337. 10.1037/1082-989X.8.3.322. [PubMed: 14596494]

Enders CK (2010). Applied missing data analysis. New York: Guilford Press.

Gardiner E, & Iarocci G (2018). Everyday executive function predicts adaptive and internalizing behavior among children with and without autism spectrum disorder. Autism Research, 11(2), 284–295. 10.1002/aur.1877 [PubMed: 28960841]

Gaumer Erickson AS, Noonan PM, Zheng C, & Brussow JA (2015). The relationship between self-determination and academic achievement for adolescents with intellectual disabilities. Research in Developmental Disabilities, 36, 45–54. 10.1016/j.ridd.2014.09.008 [PubMed: 25314099]

Gillespie-Lynch K, Kapp SK, Brooks PJ, Pickens J, & Schwartzman B (2017). Whose Expertise Is It? Evidence for Autistic Adults as Critical Autism Experts. Frontiers in Psychology, 8(MAR), 438. 10.3389/fpsyg.2017.00438 [PubMed: 28400742]

Gioia GA, Isquith PK, Guy SC, & Kenworthy L (2015). Baehavior Rating Inventory of Executive Function, Second Edition (BRIEF 2).

Gioia G, Isquith P, Guy S, & Kenworthy L (2000). BRIEF: Behavior Rating Inventory of Executive Function. Psychological Assessment Resources.

Gotham K, Marvin AR, Taylor JL, Warren Z, Anderson CM, Law PA, Law JK, & Lipkin PH (2015). Characterizing the daily life, needs, and priorities of adults with autism spectrum disorder from Interactive Autism Network data. Autism, 19(7), 794–804. 10.1177/1362361315583818 [PubMed: 25964655]

Granader Y, Wallace G, Hardy K, Yerys B, Lawson R, Rosenthal M, Wills M, Dixon E, Pandey J, Penna R, Schultz R, & Kenworthy L (2014). Characterizing the factor structure of parent reported executive function in autism spectrum disorders: The impact of cognitive inflexibility. Journal of Autism and Developmental Disorders. https://hsrc.himmelfarb.gwu.edu/smhs_psych_facpubs/181

Graham JW (2003). Adding missing-data relevant variables to FIML-based structural equation models. Structural Equation Models, 10, 80–100.

Graham JW(2009). Missing data analysis: Making it work in the real world. Annual Reviews of Psychology, 60, 549–576.

Henninger NA, & Taylor JL (2012). Outcomes in adults with autism spectrum disorders: a historical perspective. Autism, 12(1971), 1–14. 10.1177/1362361312441266

Hill E, Berthoz S, & Frith U (2004). Brief report: Cognitive processing of own emotions in individuals with autistic spectrum disorder and in their relatives. Journal of Autism and Developmental Disorders, 34(2), 229–235. 10.1023/B:JADD.0000022613.41399.14 [PubMed: 15162941]

Hill EL (2004). Executive dysfunction in autism. In Trends in Cognitive Sciences (Vol. 8, Issue 1, pp. 26–32). Elsevier Ltd. 10.1016/j.tics.2003.11.003 [PubMed: 14697400]

Hollocks MJ, Lerh JW, Magiati I, Meiser-Stedman R, & Brugha TS (2019). Anxiety and depression in adults with autism spectrum disorder: A systematic review and meta-analysis. In Psychological Medicine (Vol. 49, Issue 4, pp. 559–572). Cambridge University Press. 10.1017/S0033291718002283 [PubMed: 30178724]

Howlin P (2003). Outcome in high-functioning adults with autism with and without early language delays: Implications for the differentiation between autism and asperger syndrome. Journal of Autism and Developmental Disorders, 33(1), 3–13. 10.1023/A:1022270118899 [PubMed: 12708575]

Howlin P, Goode S, Hutton J, & Rutter M (2004). Adult outcome for children with autism. Journal of Child Psychology and Psychiatry, 45(2), 212–229. 10.1111/j.1469-7610.2004.00215.x [PubMed: 14982237]

Individuals With Disabilities Education Act, 20 U.S.C. § 1400 (2004).

Kenworthy LE, Black DO, Wallace GL, Ahluvalia T, Wagner AE, & Sirian LM (2005). Disorganization: The forgotten executive dysfunction in high-functioning autism (HFA) spectrum disorders. Developmental Neuropsychology, 28(3), 809–827. 10.1207/s15326942dn2803_4 [PubMed: 16266250]

Kenworthy L, Yerys BE, Anthony LG, & Wallace GL (2008). Understanding executive control in autism spectrum disorders in the lab and in the real world. In Neuropsychology Review (Vol. 18, Issue 4, pp. 320–338). Neuropsychol Rev. 10.1007/s11065-008-9077-7 [PubMed: 18956239]

Kim SY (2019). The experiences of adults with autism spectrum disorder: Self-determination and quality of life. In Research in Autism Spectrum Disorders (Vol. 60, pp. 1–15). Elsevier Ltd. 10.1016/j.rasd.2018.12.002

Kraper CK, Kenworthy L, Popal H, Martin A, & Wallace GL (2017). The Gap Between Adaptive Behavior and Intelligence in Autism Persists into Young Adulthood and is Linked to Psychiatric Co-morbidities. Journal of Autism and Developmental Disorders, 47(10), 3007–3017. 10.1007/s10803-017-3213-2 [PubMed: 28710532]

Lai CLE, Lau Z, Lui SSY, Lok E, Tam V, Chan Q, Cheng KM, Lam SM, & Cheung EFC (2017). Meta-analysis of neuropsychological measures of executive functioning in children and adolescents with high-functioning autism spectrum disorder. Autism Research, 10(5), 911–939. 10.1002/aur.1723 [PubMed: 27874266]

Landry O, & Al-Taie S (2016). A Meta-analysis of the Wisconsin Card Sort Task in Autism. Journal of Autism and Developmental Disorders, 46(4), 1220–1235. 10.1007/s10803-015-2659-3 [PubMed: 26614085]

Laxman DJ, Taylor JL, DaWalt LS, Greenberg JS, & Mailick MR (2019). Loss in services precedes high school exit for teens with autism spectrum disorder: A longitudinal study. Autism Research, 12(6), 911–921. 10.1002/aur.2113 [PubMed: 31033222]

Mazefsky CA, Kao J, & Oswald DP (2011). Preliminary evidence suggesting caution in the use of psychiatric self-report measures with adolescents with high-functioning autism spectrum disorders. Research in Autism Spectrum Disorders, 5(1), 164–174. 10.1016/j.rasd.2010.03.006 [PubMed: 24013401]

Ottenvall Hammar I, Dahlin-Ivanoff S, Wilhelmson K, & Eklund K (2016). Self-determination among community-dwelling older persons: explanatory factors. Scandinavian Journal of Occupational Therapy, 23(3), 198–206. 10.3109/11038128.2015.1126348 [PubMed: 26757779]

Pellicano E, Kenny L, Brede J, Klaric E, Lichwa H, & McMillin R (2017). Executive function predicts school readiness in autistic and typical preschool children. Cognitive Development, 43, 1–13. 10.1016/j.cogdev.2017.02.003

Pennington BF, & Ozonoff S (1996). Executive functions and developmental psychopathology. In Journal of Child Psychology and Psychiatry and Allied Disciplines (Vol. 37, Issue 1, pp. 51–87). Wiley Subscription Services, Inc., A Wiley Company. 10.1111/j.1469-7610.1996.tb01380.x [PubMed: 8655658]

Petcu SD, Van Horn ML, & Shogren KA (2017). Self-Determination and the Enrollment in and Completion of Postsecondary Education for Students With Disabilities. Career Development and Transition for Exceptional Individuals, 40(4), 225–234. 10.1177/2165143416670135

Pierson MR, Carter EW, Lane KL, & Glaeser BC (2008). Factors Influencing the Self-Determination of Transition-Age Youth With High-Incidence Disabilities. Career Development for Exceptional Individuals, 31(2), 115–125. 10.1177/0885728808317659

Pugliese C, Anthony L, Strang J, Dudlley K, Wallace G, & Kenworthy L (2015). Increasing adaptive behavior skill deficits from childhood to adolescence in autism spectrum disorder: Role of executive function. Journal of Autism and Developmental Disorders, 45(6), 1579–1587. 10.1002/aur.1474.Replication [PubMed: 25398602]

Pugliese CE, Anthony LG, Strang JF, Dudley K, Wallace GL, Naiman DQ, & Kenworthy L (2016). Longitudinal Examination of Adaptive Behavior in Autism Spectrum Disorders: Influence of Executive Function. Journal of Autism and Developmental Disorders, 46(2), 467–477. 10.1007/s10803-015-2584-5 [PubMed: 26349921]

Radloff L (1977). The CED-D scale: a self-report depression scale for research in the general population. Applied Psychological Measurement, 1(3), 385–401. 10.1177/014662167700100306

Roux AM, Shattuck PT, Rast JE, Rava JA, & Anderson KA (2015). National Autism Indicators report: transition into young adulthood. In Life Course Outcomes Research Program, A.J. Drexel Autism Institute, Drexel University. Life Course Outcomes Research Program, A. J. Drexel Autism Institute, Drexel University.

Shattuck PT, Narendorf SC, Cooper B, Sterzing PR, Wagner M, & Taylor JL (2012). Post-secondary Education and Employment Among Youth With an Autism Spectrum Disorder. Pediatrics, 129(6), 1042–1049. 10.1542/peds.2011-2864 [PubMed: 22585766]

Shogren KA, & Plotner AJ (2012). Transition planning for students with intellectual disability, autism, or other disabilities: Data from the national longitudinal transition study-2. Intellectual and Developmental Disabilities, 50(1), 16–30. 10.1352/1934-9556-50.1.16 [PubMed: 22316223]

Shogren KA, & Shaw LA (2017). The Impact of Personal Factors on Self-Determination and Early Adulthood Outcome Constructs in Youth With Disabilities. Journal of Disability Policy Studies, 27(4), 223–233. 10.1177/1044207316667732

Shogren KA, Wehmeyer ML, Palmer SB, Rifenbark GG, & Little TD (2015). Relationships Between Self-Determination and Postschool Outcomes for Youth With Disabilities. Journal of Special Education, 48(4), 256–267. 10.1177/0022466913489733

St. John T, Dawson G, & Estes A (2018). Brief Report: Executive Function as a Predictor of Academic Achievement in School-Aged Children with ASD. Journal of Autism and Developmental Disorders, 48(1), 276–283. 10.1007/s10803-017-3296-9 [PubMed: 28889315]

Taylor JL, & DaWalt LS (2017). Brief Report: Postsecondary Work and Educational Disruptions for Youth on the Autism Spectrum. Journal of Autism and Developmental Disorders, 47(12), 4025–4031. 10.1007/s10803-017-3305-z [PubMed: 28889215]

Taylor JL, & Gotham KO (2016). Cumulative life events, traumatic experiences, and psychiatric symptomatology in transition-aged youth with autism spectrum disorder. Journal of Neurodevelopmental Disorders, 8(1), 28. 10.1186/s11689-016-9160-y [PubMed: 27468315]

Taylor JL, & Mailick MR (2014). A longitudinal examination of 10-year change in vocational and educational activities for adults with autism spectrum disorders. Developmental Psychology, 50(3), 699–708. 10.1037/a0034297 [PubMed: 24001150]

Taylor JL, & Seltzer MM (2011). Employment and post-secondary educational activities for young adults with autism spectrum disorders during the transition to adulthood a. Journal of Autism and Developmental Disorders, 41(5), 566–574. 10.1007/s10803-010-1070-3 [PubMed: 20640591]

Tomaszewski B, Kraemer B, Steinbrenner JR, Smith DaWalt L, Hall LJ, Hume K, & Odom S (2020). Student, Educator, and Parent Perspectives of Self-Determination in High School Students with Autism Spectrum Disorder. Autism Research, 13(12), 2164–2176. 10.1002/aur.2337 [PubMed: 32743977]

Van Dam NT, & Earleywine M (2011). Validation of the Center for Epidemiologic Studies Depression Scale-Revised (CESD-R): Pragmatic depression assessment in the general population. Psychiatry Research, 186(1), 128–132. 10.1016/j.psychres.2010.08.018 [PubMed: 20843557]

Van Hees V, Moyson T, & Roeyers H (2015). Higher Education Experiences of Students with Autism Spectrum Disorder: Challenges, Benefits and Support Needs. Journal of Autism and Developmental Disorders, 45(6), 1673–1688. 10.1007/s10803-014-2324-2 [PubMed: 25448918]

Wallace GL, Yerys BE, Peng C, Dlugi E, Anthony LG, & Kenworthy L (2016). Assessment and Treatment of Executive Function Impairments in Autism Spectrum Disorder: An Update. International Review of Research in Developmental Disabilities, 51, 85–122. 10.1016/bs.irrdd.2016.07.004

Wehmeyer ML (1998). Self-Determination and Individuals With Significant Disabilities: Examining Meanings and Misinterpretations (Vol. 23, Issue 1).

Wehmeyer ML, & Garner NW (2003). The Impact of Personal Characteristics of People with Intellectual and Developmental Disability on Self-determination and Autonomous Functioning. Journal of Applied Research in Intellectual Disabilities, 16(4), 255–265. 10.1046/j.1468-3148.2003.00161.x

Wehmeyer ML, Shogren KA, Zager D, Smith TEC, Shogren KA, Zager D, Smith TEC, & Simpson R (2010). Research-Based Principles and Practices for Educating and Social Interactions. Education & Training in Autism & Developmental Disabilities, 45(4), 475–486.

Wehmeyer M, & Schwartz M (1997). Self-Determination and Positive Adult Outcomes: A Follow-up Study of Youth with Mental Retardation or Learning Disabilities. Exceptional Children, 63(2), 245–255. 10.1177/001440299706300207

White K, Flanagan TD, & Nadig A (2018). Examining the Relationship Between Self-Determination and Quality of Life in Young Adults with Autism Spectrum Disorder. Journal of Developmental and Physical Disabilities, 30(6), 735–754. 10.1007/s10882-018-9616-y

White SW, Elias R, Capriola-Hall NN, Smith IC, Conner CM, Asselin SB, Howlin P, Getzel EE, & Mazefsky CA (2017). Development of a College Transition and Support Program for Students with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 47(10), 3072–3078. 10.1007/s10803-017-3236-8 [PubMed: 28685409]

White SW, Smith IC, Miyazaki Y, Conner CM, Elias R, & Capriola-Hall NN (2019). Improving Transition to Adulthood for Students with Autism: A Randomized Controlled Trial of STEPS. Journal of Clinical Child and Adolescent Psychology. 10.1080/15374416.2019.1669157

Wolman JM, Campeau PL, DuBois PA, Mithaug DE, & Stolarkski VS (1994). American Institutes for Research: Self-Determination Scale and User Guide. American Institute for Research.

Xiao J, & Bulut O (2020). Evaluating the performances of missing data handling methods in ability estimation from sparse data. Educational and Psychological Measurement, 80(5), 932–954. 10.1177/0013164420911136 [PubMed: 32855565]

Zalewska A, Migliore A, & Butterworth J (2016). Self-determination, social skills, job search, and transportation: Is there a relationship with employment of young adults with autism? Journal of Vocational Rehabilitation, 45(3), 225–239. 10.3233/JVR-160825

Zheng C, Gaumer Erickson A, Kingston NM, & Noonan PM (2014). The relationship among self-determination, self-concept, and academic achievement for students with learning disabilities. Journal of Learning Disabilities, 47(5), 462–474. 10.1177/0022219412469688 [PubMed: 23223201]

Zuckerman H, Pan Z, Park C, Brietzke E, Musial N, Shariq AS, Iacobucci M, Yim SJ, Lui LMW, Rong C, & McIntyre RS (2018). Recognition and Treatment of Cognitive Dysfunction in Major Depressive Disorder. In Frontiers in Psychiatry (Vol. 9). Frontiers Media S.A. 10.3389/fpsyt.2018.00655

Table 1.

Example Items for the AIR-SDS

Student			
Capacity		***Opportunity***	
Ability Think	I know what I need, what I like, and what I'm good at.	At School Think	People at school listen to me when I talk about what I want, what I need, or what I'm good at.
Ability Do	I figure out how to meet my goals. I make plans and decide what I should do.	At School Do	People at school encourage me to start working on my plans right away.
Ability Adjust	If my plan doesn't work, I try another one to meet my goals.	At School Adjust	I have someone at school who can tell me if I am meeting my goals.
Perception Think	I believe that I can set goals to get what I want	At Home Think	People at home let me know that I can set my own goals to get what I want or need.
Perception Do	I like to begin working on my plans right away.	At Home Do	At home, I have learned how to make plans to meet my goals and to feel good about them.
Perception Adjust	I am willing to try another way if it helps me meet my goals.	At Home Adjust	People at home understand when I have to change my plan to meet my goals. They offer advice and encourage me when I'm doing this.
Parent			
Ability Think	My child sets his or her own goals to satisfy wants or needs. (S)he thinks about his or her own abilities when setting goals.	At Home Think	At home, people let my child know that (s)he can set his or her own goals to get what (s)he wants or needs.
Ability Do	My child figures out how to meet goals alone. (S)he makes plans and decides what to do independently.	At Home Do	At home, my child has learned how to make plans to meet his or her own goals and to feel good about them.
Ability Adjust	My child checks his or her own progress when completing his or her plan. (S)he asks others what they think of his or her progress.	At Home Adjust	At home, people understand my child when (s)he has to change plans to meet his or own goals. They offer advice and encouragement.

Table 2.

Self-Determination Descriptive Statistics

	Parent Level		Student Level				
Self-Determination Level	**M(SE)**	**Range**	**M(SE)**	**Range**	**t**	**p-value**	**η^2**
Capacity	56.42(.96)	23–100	68.43(.86)	31–100	9.28	<.001	.16
Opportunities at Home	75.76(1.01)	40–100	79.92(.93)	27–100	3.00	.003	.02
Opportunities at School	76.81(1.19)	33–100	67.66(1.89)	20–100	9.15	<.001	.07

Note. Items are summarized across the 18 multiple imputed datasets for 237 participants

Table 3.

Item Statistics for the Confirmatory Factor Analysis of the AIR Self-Determination Scale Student and Parent Forms

Domain	Items	Mean (SD)	Corrected item-total correlation	Standardized factor loading
Student Capacity	Do1s	3.94(.77)	.50	.61
	Do2s	3.31(.89)	.70	.77
	Do3s	3.28(.91)	.69	.77
	Do4s	3.09(.99)	.68	.80
	Do5s	3.03(1.07)	.59	.70
	Do6s	3.29(1.01)	.59	.66
	Feel1s	3.95(.87)	.41	.55
	Feel2s	3.76(.90)	.60	.69
	Feel3s	3.42(1.04)	.70	.79
	Feel4s	3.14(1.05)	.62	.75
	Feel5s	3.18(1.03)	.73	.82
	Feel6s	3.60(.92)	.53	.62
	Home3s	3.61(1.02)	.53	.45
	School3s	3.37(1.03)	.56	.44
Student Opportunity at Home	Home1s	4.10(.93)	.62	.75
	Home2s	4.10(.99)	.71	.84
	Home3s	3.61(1.02)	.52	.44
	Home4s	4.02(1.05)	.68	.77
	Home5s	4.12(1.05)	.63	.76
	Home6s	4.01(1.03)	.68	.82
Student Opportunity at School	School1s	3.42(1.04)	.57	.70
	School2s	3.35(1.20)	.72	.81
	School3s	3.38(1.04)	.55	.50
	School4s	3.50(1.28)	.73	.81
	School5s	3.36(1.32)	.66	.77
	School6s	3.38(1.16)	.72	.83
Parent-Reported Capacity	Do1p	3.72(.75)	.33	.41
	Do2p	2.96(.84)	.74	.89
	Do3p	2.65(.86)	.75	.88
	Do4p	2.56(.90)	.65	.78
	Do5p	2.54(.94)	.63	.76
	Do6p	2.59(.89)	.68	.80
	Home3p	3.35(.95)	.57	.49
	School3p	3.28(.82)	.51	.50
Parent-Reported Opportunity at Home	Home1p	4.02(.692)	.54	.82
	Home2p	4.08(.750)	.54	.80
	Home3p	3.35(.95)	.53	.42

Domain	Items	Mean (SD)	Corrected item-total correlation	Standardized factor loading
	Home4p	3.97(.785)	.42	.53
	Home5p	4.00(.911)	.30	.81
	Home6p	4.18(.807)	.40	.92
Parent-Reported Opportunity at School	School1p	3.94(.85)	.60	.88
	School2p	4.00(.88)	.52	.80
	School3p	3.35(.95)	.71	.42
	School4p	3.66(.892)	.55	.71
	School5p	3.81(.923)	.39	.83
	School6p	3.77(.947)	.49	.93