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## Prevalence and correlates of postsecondary residential status among young adults with an autism spectrum disorder

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### Abstract

This study examined the prevalence and correlates of three living arrangements (with a parent or guardian, independently or with a roommate, or in a supervised setting) among a nationally representative sample of postsecondary young adults with an autism spectrum disorder (ASD). We assessed living arrangements since leaving high school. Compared with young adults with other disability types (learning disabilities, intellectual disabilities, or emotional disturbances), those with an ASD were more likely to have lived with a parent or guardian and least likely ever to have lived independently since leaving high school. Members of the ASD group were less likely to have ever lived elsewhere and more likely to live under supervision since leaving high school compared to persons with emotional disturbances and learning disabilities. Group differences persisted after controlling for functional ability and demographic characteristics. Correlates of residential independence included: being White, having better conversation ability and functional skills, and having a higher household income. Further research is needed to investigate how these residential trends relate to the quality of life among families and young adults.

### Keywords

autism; adulthood; residence; transition

### Introduction

The prevalence of autism spectrum disorders (ASDs) has increased since the early 1990s (Centers for Disease Control and Prevention [CDC], 2012). One in 88 American children

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have an ASD, a 78% increase from 2002 to 2008 (Autism and Developmental Disabilities Monitoring Network [ADDM], 2012; CDC, 2012). Consequently, there are a growing number of adolescents with an ASD transitioning into adulthood. As these numbers continue to rise, so too does the need to understand the transition experience of young adults with ASDs in today's world.

ASDs are characterized by social impairments, communication difficulties, and repetitive behaviors (American Psychiatric Association, 2000). These core challenges and the comorbid conditions that often accompany ASDs reduce the likelihood that young adults can successfully attain the social roles that mark a normative transition from adolescence to adulthood. Furthermore, this developmental period is accompanied by a shift in service provision options as youth lose entitlement to school-based special education services (Interagency Autism Coordinating Committee [IACC], 2011; Shattuck et al., 2012b). The IACC recognized this problem in their 2011 Strategic Plan for Autism Spectrum Disorder Research, calling for more research on the transition out of special education.

### Postsecondary transition

Life course theory argues that the sequence of events that lead an adolescent to adulthood is influenced by economic, social, and cultural factors (Shanahan, 2000). Defining normative transition sequences is difficult, as the macro social environment has changed markedly over the past several decades. Indicators of a normative transition in earlier decades included completing high school, attaining financial independence and a full-time job, leaving the parental home, and starting a family (Hendricks and Wehman, 2009; Leiter and Waugh, 2009; Smith, 2004). Although these continue to be markers of a successful transition to adulthood, the sequencing of them has changed in recent years. Most notably, the duration of the transition process into adulthood takes longer in contemporary society than it did in the past (Arnett, 2000; Côte and Bynner, 2008; Osgood et al., 2005). Therefore, the period of emerging adulthood (18–25 years) is of pivotal importance for later development as young adults embark on new challenges and acquire new social roles (Arnett, 2000; De Marco and Berzin, 2008).

Residential independence has often been viewed as a key marker of entry to adulthood. Prior to the 1980s, it was considered non-normative for a child to continue residing with their parent or return home after completing college - the next normative steps were marriage and residential autonomy (Kins et al., 2009). However, today's typically developing young adults are leaving home later and returning home more often (De Marco and Berzin, 2008). In 2010, approximately 15.8 million adults were residing with their parents and of those, 6.2 million people were between the ages of 18 and 25 years (U.S. Census Bureau, 2012). One study found that approximately 42% of all young adults aged 20 to 24 years were living with their parents in 2010 (Aud, KewalRamani and Frohlich, 2011).

Higher rates of parent-child cohabitations among the general population are often attributed to an increase in postsecondary education pursuits and fewer job opportunities available to young adults (Furstenberg, 2010; Leiter and Waugh, 2009). When compared to the general population, young adults with developmental disabilities have lower rates of postsecondary education and independent living (Newman et al., 2011). Young adults with an ASD have

even lower rates of postsecondary education and employment participation compared to young adults with some other disability types (Shattuck et al., 2012a). However, it is unclear how the contemporary home leaving experiences of individuals with an ASD are also different.

### **Conceptual and methodological issues in extant ASD literature**

As a reflection of the deinstitutionalization movement, past research often defines transition success for young adults with disabilities by the extent to which they meet normative expectations of independence and social inclusion (Henninger and Taylor, 2012; Ruble, 1996). Under this framework, young adults residing in the parental home or in supervised settings have failed to attain normative outcomes (Halpern, 1993).

While residential continuity is often considered a positive thing when assessing quality of life among young adults, it is seldom researched. Experiencing a multitude of living arrangements is considered non-normative. Instead of returning to the parental home after leaving, young adults are expected to remain in independent living arrangements. Nevertheless, Arnett (2000) poses that discontinuity and exploration defines the period of emerging adulthood as young adults are given the opportunity to try different living arrangements and pursue different careers. Home leaving and returning is becoming more common in today's society. Further examination of the continuity of living arrangements among young adults with an ASD is needed.

Findings consistently show that the proportion of individuals with an ASD living independently is very low (Billstedt, Gillberg and Gillberg, 2005; Howlin et al., 2004). For example, Billstedt et al (2005) studies 120 individuals aged 17–40 years and found that only four participants were living independently. It is important to note that studies like this have tended to have small sample sizes, highly variable age ranges (i.e., not focused just on emerging adulthood), and many are not based in the United States thereby limiting their usefulness for informing domestic policy.

There is a need for research that assesses living arrangements during the years immediately following high school. Although some studies have examined residential outcomes among young adults with developmental disabilities during emerging adulthood, many are outdated and fail to include autism spectrum disorders (Wagner, 1993; Wells, Sandefur and Hogan, 2003). As the population of young adults with an ASD continues to increase, there is a need to report the most current estimates of residential status.

A recent report used data from the National Longitudinal Transition Study-2 (NLTS2) to assess prevalence of independent living among high school graduates (Newman et al., 2011). Compared with young adults with intellectual disabilities (IDs), learning disabilities (LDs) or emotional disturbance (EDs), individuals with ASDs were the least likely to be living apart from their parents (17% vs. 36%, 65% and 63% respectively). Although this report was nationally representative, the focus was primarily on univariate point estimates of living arrangements with no stratification by impairment severity or demographics within the ASD population.

The present study examined the prevalence and correlates of postsecondary living arrangements among emerging adults (ages 21–25 years) with an ASD. Although our findings are also drawn from wave 5 of the NLTS2, our study reports on a wider range of residential outcomes and stratifies living arrangement by a larger set of covariates than used by Newman and colleagues (2011). This study will help fill gaps in extant literature because our sample consists of postsecondary young adults and is nationally representative. We also examined residential continuity, a topic often overlooked in extant studies.

Providing recent national estimates of where young adults with an ASD live after high school can help families and service providers prepare for the transition process and increase their understanding of the types of postsecondary living arrangements available to them. Furthermore, national estimates will provide a baseline by which to gauge changes across time in residential transition during the period of emerging adulthood.

## Methods

### Ethics statement

Use of these data was deemed exempt by the Washington University Institutional Review Board. In compliance with U.S. Department of Education rules, unweighted sample sizes were rounded to the nearest 10, and point estimates based on fewer than three cases were omitted.

### Study sample

The National Longitudinal Transition Study 2 (NLTS2) was funded by the U.S. Department of Education and followed a nationally representative sample of students who were ages 13 through 16 years and receiving special education services in December, 2000 (SRI International, 2000). Data were collected in five waves, 2 years apart, from 2001 to 2009 (Wagner et al., 2005). At the end of the study, participants had been out of high school for up to ten years. A multistage sampling procedure was used, initially contacting local education agencies and state-supported special schools. Students were sampled from rosters and families were invited to participate (Wagner et al., 2005). This study was based primarily on data from wave 5, collected from March 2009 to June 2009 (SRI International, 2000). After answering a set of questions, parents or guardians were asked if the young adult was capable of answering a second set of questions. If the parent or guardian responded yes, the young adult was contacted to complete the second portion of the survey; if young adults could not be reached, parents were asked to complete it (SRI International, 2000).

Under the Individuals with Disabilities Education Act (2004), a student must meet eligibility criteria under one of twelve disability categories to qualify for special education services. However, prior research suggests the autism category in special education very rarely includes students who would not also meet case criteria for an autism spectrum diagnosis (Yeargin-Allsop et al., 2003). The autism group (N=620) was compared with young adults who had been enrolled in one of three other special education disability categories at the start of the study when participants were still in secondary school. Comparison groups included: mental retardation (MR=450), learning disabilities (LD=410) and emotional

disturbance (ED=380). We used the term *mental retardation* to remain consistent with federal special education disability definitions and how the data were collected, although *intellectual disability* is the currently preferred term. Young adults were excluded from the comparison groups if parents reported ever being told the youth also had autism.

The use of comparison groups better contextualizes the transition experience among young adults with an ASD. Osgood, Foster and Courtney (2010) state that participation in public institutions, such as special education, may reduce the likelihood of postsecondary success with employment and independent living. Although differences exist among members of disability categories, all respondents were involved in the special education service system and thus subject to the challenges and vulnerabilities that accompany the transition experience.

## Measures

**Outcome variables**—Current living status was assessed with an open-ended question and answers were coded into types of living arrangements. Another question asked whether the young adult had ever lived somewhere other than their current place of residence since leaving high school. Responses to this question were used to measure residential continuity; a response “no” indicates they had never lived elsewhere since leaving high school. If “yes” then further probing inquired about other types of living arrangements since high school. There were no questions at wave 5 about the sequencing or timing of living situations since high school. We could only ascertain the period prevalence of different types of living situation since high school.

We created three dichotomous outcome variables to determine where the young adult had lived since leaving high school: ever with a parent or guardian (including a legal guardian, other relative or adult family member, or foster parents), ever independently (on their own, with a spouse or roommate, in a college dormitory or other college housing, or in military housing), or ever in a supervised setting (residential or boarding schools other than college, hospitals, medical facilities, convalescent hospital or institution for persons with disabilities, a group home or assisted living center, mental facilities or correctional facilities). The prevalence in most of the minor categories was so low that we could not report the rates without violating the data use agreement.

**Independent variables**—Prior literature has found that measures of impairment severity and household income are risk factors for worse outcomes in terms of service receipt, social participation, employment and postsecondary education attainment (Shattuck 2011, 2012a, 2012b). We also included demographic variables in order to test for disparities: gender, age, ethnicity, and race. Impairment severity measures included an overall health rating, conversation ability (measured using a 4-point parent-report scale, ranging from no trouble conversing to does not converse at all), and functional skills (a scale from summing the 4-category ordinal scores (not at all well, not very well, pretty well, very well) from eight questions that asked parents how well the young adult could: tell time on an analog clock, read and understand common signs, count change, look up telephone numbers and use a telephone, get to places outside of the home, use public transportation, buy clothes at a store,

and arrange travel to go out of town, (Cronbach's alpha = .93 for the ASD group). Additional correlates included years since leaving high school, having ever worked for pay since high school, and type of health insurance.

**Analysis**—Missing data rates per correlate ranged from 0% to 21% (household income), with functional skills missing 20%, health insurance (17%), years out of high school (16%) and having ever lived in more than one residential arrangement (13%). All remaining variables had missing rates less than 8%. Missing values were imputed using sequential regression in IVEware (version 0.1) to create 50 sets of data implicates with no missing values (Raghunathan et al., 2002). Univariate proportions and 95% confidence intervals summarized the characteristics of the population. Between-group differences in residential arrangement were tested using dummy coding and logistic regression. Logistic regression assessed the covariates of residential status within the ASD group. All reported estimates were weighted and variances were adjusted in accordance with the complex sampling approach using Stata v. 12.

## Results

Compared to young adults from other categories, those in the ASD category were more likely male (85%) and from families that had higher income (18% had parents with a family household income of > \$75,000) (Table 1). The proportion of African Americans was unusually high in the MR group, consistent with historic trends of their disproportionate representation in this special education category (Donovan and Cross, 2002). Young adults with an ASD had relatively low rates of fair or poor health (8.5%) but high rates of no conversation ability (17.1%) compared to other disability groups. The majority of ASD participants had been out of high school for two to six years.

Compared with the other disability categories, young adults with an ASD were significantly more likely to have ever lived with a parent or guardian (87.1%) and less likely to have ever lived independently (16.6%) since leaving high school (Table 2). Also, young adults with an ASD experienced the highest rates of postsecondary residential continuity (79.1%). In follow-up analyses not shown in tables, we found no independent living among young adults with ASD who had been out of high school for two years or less at the time of the survey. In contrast, the comparable rate was 22.2% for youth in the MR group.

Many unadjusted group differences reported in Table 2 were still significant after adjusting for a range of covariates (Table 3). The adjusted odds of having ever lived independently were more than five times higher for the ED and LD groups and 2.2 times higher for the MR group compared with young adults with an ASD. Moreover, the odds of ever living with a parent or guardian were about 0.3 times less likely for young adults in the ED or LD groups compared to those in the ASD group. Individuals in the ED and LD category were 0.3 times less likely to have never lived elsewhere. The difference in the likelihood of living with parents between the MR and ASD groups was no longer significant after adjusting for covariates. Having ever lived in a supervised setting was also no longer significant among the LD and MR groups compared to the ASD category after adjusting for covariates.

Regarding correlates of independent living (Table 4), the odds that a young adult with an ASD had ever lived independently since leaving high school were higher for those from families with higher household incomes (OR=1.3, 95% CI 1.1–1.5,  $p < .05$ ), those with higher functional skills (OR=1.3, 95% CI 1.1–1.4,  $p < .001$ ) and stronger conversation abilities (OR=2.5, 95% CI 1.2–5.2,  $p < .05$ ). The adjusted odds of having ever lived with a parent or guardian were 3.1 times higher for Hispanic young adults with an ASD than non-Hispanic adults. The adjusted odds of having ever lived independently were lower for young adults who were African-American (OR=0.2, 95% CI .03–0.9,  $p < .05$ ). Having public insurance was the only significant predictor of ever living in a supervised setting (OR=3.0, 95% CI 1.0–8.5,  $p < .05$ ). Higher functional skills (OR=0.9, 95% CI 1.02–1.0,  $p < .05$ ) and being older (OR=0.7, 95% CI 0.5–1.0,  $p < .05$ ) were associated with lower adjusted odds of postsecondary residential continuity.

## Discussion

Overall, our findings show that young adults with an ASD have a different residential transition experience than their peers with ED, LD or MR. Young adults with an ASD resided with a parent or guardian at higher rates and for longer periods of time after leaving high school than young adults with ED, LD or MR. Moreover, young adults with an ASD had the highest rate of supervised living arrangements and the lowest rate of independent living since leaving high school.

Our findings mirror those of prior research: rates of independent living are low for young adults with an ASD (Billstedt, Gillberg and Gillberg, 2005; Howlin et al., 2004; Newman et al., 2011). Our ability to compare these outcomes to young adults in other disability groups better contextualizes these findings: the ASD group is unique. We were able to measure whether between-group differences persisted after controlling for demographic characteristics and impairment severity and found that individuals with an ASD were significantly less likely than young adults with ED, LD or MR to have ever lived independently since leaving high school.

The first two years immediately following high school differentiate young adults with an ASD from those in other disability categories. Most notable is the stark difference in independent living rates between young adults with an ASD and those with MR: the proportion of young adults with an ASD who had ever lived independently was significantly lower the first two years immediately following high school. Shattuck et al (2012a) found similar differences when assessing participation in postsecondary education and employment outcomes among young adults leaving the special education system. Members of the ASD group who had been out of high school for less than two years had higher rates of disengagement, suggesting that young adults with an ASD are particularly vulnerable during the initial years in the transition to adulthood. Young adults with an ASD are particularly vulnerable as they experience a shift in service provision after leaving high school and are highly susceptible to service disengagement (Shattuck et al, 2011). Further investigation is needed to evaluate possible shortcomings in residential transition planning that do not fully take into account the uniqueness of those with ASDs during the years immediately following high school.

Young adults with an ASD also had the highest rates of residential continuity with 79.1% of participants having lived in the same situation since leaving high school. According to the theory of emerging adulthood, this suggests that many young adults with an ASD are not experiencing opportunities to explore various residential options as young adults.

Having ever worked for pay since leaving high school was not associated with any residential outcomes among the ASD group. An expanding literature base suggests that fewer job opportunities and an increase in postsecondary education attendance is related to parent-child cohabitation and delays in independent living (Leiter and Waugh, 2009). Nevertheless, we are unsure if this is true of young adults with disabilities. A recent study examined whether independent living was associated with postsecondary employment among young adults with developmental disabilities and found no significant relationship between the two (Williamson, Robertson and Casey, 2010). More research investigating the relationship between employment status, educational attainment, and independent living among adults with disabilities is needed.

The odds that a young adult with an ASD had ever lived independently were higher among those with better functional skills. Low functional skills may be linked to higher support needs and assistance in daily living (Leiter and Waugh, 2009). In these cases, independent living may not be the desirable or appropriate outcome.

Availability of financial resources also seems to influence the proportion of adults with an ASD who lived away from parents. Adults with an ASD from higher socioeconomic backgrounds had higher odds of living independently. This is consistent with literature that investigates the residential transition patterns among young adults in the general population (Aquilino, 1990; Shanahan, 2000). The odds of young adults with public insurance having ever lived in a supervised setting were three times higher than young adults with private insurance (Table 4). This is likely due to the fact that Medicaid or other public funding mechanisms pay for many residential services. More research is needed to better understand how insurance impacts rates of living among different disability groups. The adjusted odds of having ever lived under supervision were not significantly different between the MR and ASD group indicating both groups receive formal residential services at the same rate (Table 3). The major difference in living arrangements is in rates of independent living.

We found differences in living arrangement by race and ethnicity. African-Americans were significantly less likely to have ever lived independently since leaving high school than white adults with an ASD. The likelihood of having ever lived somewhere other than their current residence was 5.6 times higher among persons from mixed/other races. The odds that a Hispanic young adult with an ASD had ever lived with a parent or guardian since leaving high school was over three times higher than for non-Hispanics. Berry (2006) found that black and Hispanic families had higher rates of coresidency compared to white adults in the general population so long as the parents perceive it as beneficial to their child. More research on the impact race and culture play on home leaving is needed to better contextualize why these differences exist.



Similar to the general population, young adults with an ASD experience delayed home leaving patterns during the period of emerging adulthood as the majority of young adults remain in the parental home after leaving high school. Further research is needed to assess the implications this has for families and persons with an ASD. Research suggests that prolonged caregiving of an adult child with autism has adverse effects on maternal well-being (Abbeduto et al., 2007). Therefore, investigating various in-home interventions that might improve the quality of life for families and adults with ASD may be beneficial as the vast majority of young adults are residing in the parental home.

There are some limitations to this study. The NLTS2 sample is representative of youth who were eligible for special education under the autism category when they were in high school. This included students who were educated in private and special schools where tuition was paid for by the family's home public school district. Epidemiological research indicates that the vast majority (>95%) of children in the autism category also meet DSM-IV-based case criteria for an ASD (Bertrand et al., 2001; Yeargin-Allsopp et al., 2003). These reports suggest the classification of children into the special education autism category is moderately sensitive and very specific. Although not all adolescents with an ASD are served via the special education autism designation, it is unlikely that students enrolled in this category do not have an ASD. An unknown proportion of adolescents with an ASD participate in special education, but via other eligibility categories, such as mental retardation. Thus the generalizability of these findings to the entire population of youth with an ASD is not precisely known.

The characteristics among the ASD group in our sample mirror what is found in the general population of young adults on the spectrum. The male:female ratio in this ASD special education population (5.7:1) was similar to that found in a recent epidemiological surveillance estimate of 4.6:1 (ADDM, 2012). The high rate of conversation impairment, a core phenotypic feature of ASDs, in the ASD group relative to other groups increases confidence in the validity of the group distinctions. Our results also parallel past findings that individuals who have been identified with an ASD tend to come from higher income households. There is some prior evidence of potential diagnosis bias by socioeconomic status resulting in underrepresentation of young adults with an ASD in low income households (Levy, Giarelli, Lee, Schieve, and Kirb, et al. 2010). The association we found between household income and having ever lived independently since leaving high school may be biased.

Survey responses were drawn from self-reports of parents and youth which may have error due to imperfect recall. Moreover, our analyses were confined to the quantity and type of residence, but did not examine the quality of the living arrangements. While we were able to report whether the young adult had ever lived independently, under supervision or in the parental home since leaving high school, we did not have measures of the exact length of time any given youth spent in each residential setting. Moreover, we were unable to examine the reasons for residential discontinuity when it did occur. Among the general population, it is becoming increasingly common to return home after attempting to live independently or completing college (Sassler, Ciambone, & Benway, 2008). More investigation is needed on patterns of leaving and returning to the parental home among young adults with an ASD.

Our study has several strengths. The recency of the NLTS2 provides up-to-date prevalence rates that provide a baseline for future comparative studies. The nationally representative sampling strategy increases the external validity of our findings compared with studies based on community or clinic sampling strategies. The sample's diversity also allowed us to examine demographics characteristics and disparities that are commonly excluded in ASD literature (Shattuck et al., 2012c). Finally, we used a broad range of residential outcomes, increasing the relevance of our findings for policy and practice.

As the prevalence of ASDs continues to rise, so too does the number of young adults transitioning into adulthood. The evidence presented in this study suggests that the vast majority of this population will be residing in the parental or guardian home during the period of emerging adulthood. More research is needed to identify ways to effectively implement residential transition plans that best meet the needs and preferences of young adults with ASDs and their families.

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## References

- Aud, S.; KewalRamani, A.; Frohlich, L. America's Youth: Transitions to Adulthood (NCES 2012-026). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U. S. Government Printing Office; 2011.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-IV-TR. Washington, DC: American Psychiatric Association; 2000.
- Abbeduto L, Seltzer MM, Shattuck P, Krauss MW, Orsmond GI, Murphy MM. Psychological well-being and coping in mothers of youths with autism, Down syndrome, or fragile X syndrome. *American Journal of Mental Retardation*. 2007; 109:237–254. [PubMed: 15072518]
- Aquilino WS. The likelihood of parent-adult child coresidence: effects of family structure and parental characteristics. *Journal of Marriage and Family*. 1990; 52(2):405–419.
- Arnett JJ. Emerging adulthood: a theory of development from the late teens through the early twenties. *American Psychologist*. 2000; 55(5):469–480. [PubMed: 10842426]
- Autism and Developmental Disabilities Monitoring Network. Prevalence of autism spectrum disorders – autism and developmental disabilities monitoring network, 14 sites, United States, 2008. *MMWR Surveillance Summaries*. 2012; 61(3):1–19.
- Berry B. What accounts for race and ethnic differences in parental financial transfers to adult children in the United States? *Journal of Family Issues*. 2006; 27:1583–1606.
- Bertrand J, Boyle C, Yeargin-Allsopp M, Decoufle P, Mars A, et al. Prevalence of Autism in a United States Population: The Brick Township, New Jersey, Investigation. *Pediatrics*. 2001; 108:1155–1162. [PubMed: 11694696]
- Billstedt E, Gillberg C, Gillberg C. Autism after adolescence: population-based 12-to 22-year follow-up study of 120 individuals with autism diagnosed in childhood. *Journal of Autism and Developmental Disorders*. 2005; 35(3):351–360. [PubMed: 16119476]
- Centers for Disease Control and Prevention. [accessed 20 June 2012] 2012 Centers for Disease Control and Prevention Autism and Developmental Disabilities Monitoring (ADDM) Community Report. 2012. Available at: <http://www.cdc.gov/ncbddd/autism/addm.html>
- Côte J, Bynner JM. Changes in the transition to adulthood in the UK and Canada: the role of structure and agency in emerging adulthood. *Journal of Youth Studies*. 2008; 11(3):251–268.

- De Marco AC, Berzin C, Cosner S. The influence of family economic status on home-leaving patterns during emerging adulthood. *The Journal of Contemporary Social Services*. 2008; 89(2):208–218.
- Donovan, MS.; Cross, CT. *Minority students in special and gifted education*. Washington, DC: National Academy Press; 2002.
- Halpern AS. Quality of life as a conceptual framework for evaluating transition outcomes. *Exceptional Children*. 1993; 59(6):486–499.
- Hendricks DR, Wehman P. Transition from school to adulthood for youth with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*. 2009; 24(2):77–88.
- Howlin P, Goode S, Hutton J, Rutter M. Adult outcome for children with autism. *Journal of Child Psychology and Psychiatry*. 2004; 45(2):212–229. [PubMed: 14982237]
- Interagency Autism Coordinating Committee. IACC Strategic plan for autism spectrum disorder research. Washington (DC): US Department of Health and Human Services; 2011. 66 2011.
- Kins E, Beyers W, Soenens B, Vansteenkiste M. Patterns of home leaving and subjective well-being in emerging adulthood: the role of motivational processes and parental autonomy support. *Developmental Psychology*. 2009; 45(3):1416–1429. [PubMed: 19702402]
- Levy SE, Giarelli E, Lee LC, Schieve LA, Kirby RS, et al. Autism spectrum disorder and co-occurring developmental, psychiatric, and medical conditions among children in multiple populations of the United States. *J Dev Behav Pediatr*. 2010; 31:267–275. [PubMed: 20431403]
- Leiter V, Waugh A. Moving out: residential independence among young adults with disabilities and the role of families. *Marriage and Family review*. 2009; 45:519–537.
- Newman, L.; Wagner, M.; Knokey, A-M.; Marder, C.; Nagle, K.; Shaver, D.; Wei, X.; Cameto, R.; Contreras, E.; Ferguson, K.; Greene, S.; Swarting, M. *The post-high school outcomes of young adults with disabilities up to 8 years after high school—a report from the National Longitudinal Transition Study-2 (NLTS2)(NCSE 2011-3005)*. Menlo Park, CA: SRI International; 2011. Available at [www.nlts2.org/reports](http://www.nlts2.org/reports).
- Osgood, W.; Foster, M.; Flanagan, C.; Ruth, G. *On your own without a net: The transition . to adulthood for vulnerable populations*. Chicago, IL: The University of Chicago Press; 2005.
- Osgood W, Foster M, Courtney ME. Vulnerable populations and the transition to adulthood. *The Future of Children*. 2010; 20(1):209–229. [PubMed: 20364628]
- Raghuathan TE, Solenberger PW, Hoewyk Van J, Solenberger PW. A multivariate technique for multiply imputing missing values using a sequence of regression models. *Survey Methodology*. 2001; 27(1):85–95.
- Ruble L. An alternative view of outcome in autism. *Focus on Autism and other Developmental Disabilities*. 1996; 11(1):1088–3576.
- Shanahan MJ. Pathway to adulthood in changing societies: variability and mechanisms in life course perspectives. *Annual Review of Sociology*. 2000; 26:667–692.
- Shattuck PT, Orsmond GI, Wagner M, Cooper BP. Participation in social activities among adolescents with an autism spectrum disorder. *PLoS ONE*. 2011; 6(11):141–146.
- Sassler S, Ciambone D, Benway G. Are they relay mama’s boys/daddy’s girls? The negotiation of adulthood upon returning to the parental home. *Sociological Forum*. 2008; 23(4):670–698.
- Shattuck PT, Narendorf S, Cooper B, Sterzing PR, Wagner M, Taylor J. Postsecondary education and employment outcomes among youth with an autism spectrum disorder. *Pediatrics*. 2012a OnlineFirst ahead of print 14 May 2012.
- Shattuck PT, Wagner M, Narendorf S, Sterzing PR, Hensley M. Post-high school service use among young adults with an autism spectrum disorder. *Archives of Pediatrics and Adolescent Medicine*. 2012b; 165(2):141–146. [PubMed: 21300654]
- Shattuck PT, Roux AM, Hudson LE, Taylor J, Maenner M, Trani J. Services for adults with an autism spectrum disorder. *Canadian Journal of Psychiatry*. 2012c; 57(5):284–291.
- Smith T. Coming of age in twenty-first century America: public attitudes towards the importance and timing of transitions to adulthood. *Ageing international*. 2004; 29(2):136–148.
- SRI International. National Longitudinal Transition Study II (NLTS2) study design, timeline and data collection plan. 2000. Retrieved from: [http://www.nlts2.org/studymeth/nlts2\\_design\\_timeline2.pdf](http://www.nlts2.org/studymeth/nlts2_design_timeline2.pdf)

- Author Manuscript
- Author Manuscript
- Author Manuscript
- Author Manuscript
- Wagner, M. The transition experiences of young people with disabilities – summary of findings from the national longitudinal transition study of special education students. 1993. Retrieved from: <http://eric.ed.gov:80/PDFS/ED365086.pdf>
- Wagner M, Kutash K, Duchnowski A, Epstein M. The special education elementary longitudinal study and the national longitudinal transition study: study designs and implications for children and youth with emotional disturbance. *Journal of Emotional and Behavioral Disorders*. 2005; 13(1): 25–41.
- Wells T, Sandefur GD, Hogan DP. What happens after the high school years among young persons with disabilities? *Social Forces*. 2003; 82(2):803–832.
- Yeargin-Allsopp M, Rice C, Karapurkar T, Doernberg N, Boyle C, Murphy C. Prevalence of autism in a US metropolitan area. *JAMA*. 2003; 289:49–55. [PubMed: 12503976]

**Table 1**

Population characteristics across groups, percentages or means and 95% confidence intervals.

Covariate	Autism Spectrum Disorder	Mental Retardation	Emotional Disturbance	Learning Disability
Male	85.0 [79.6, 89.2]	54.7*** [48.8, 60.4]	72.3** [65.2, 78.4]	64.5*** [58.1, 70.5]
Age (mean years)	23.3 [23.1, 23.4]	23.3 [23.2, 23.5]	23.2 [23.0, 23.4]	23.1 [23.0, 23.3]
Hispanic	10.0 [5.9, 16.3]	11.3 [7.5, 16.5]	14.2 [9.6, 20.4]	22.5*** [16.0, 30.7]
Race				
White	70.1 [63.1, 76.3]	57.4** [49.4, 65.1]	60.1 [48.2, 70.9]	67.3 [57.3, 76.0]
African-American	18.8 [13.6, 25.4]	31.8** [25.2, 39.2]	23.3 [14.3, 35.6]	15.7 [10.3, 23.1]
Mixed/other	11.1 [7.7, 15.7]	10.8 [7.3, 15.7]	16.6 [11.9, 22.7]	17.1 [12.0, 23.8]
Parent or guardian household income				
Up to \$25000	16.1 [11.1, 22.5]	46.2*** [39.3, 53.1]	32.7*** [25.6, 40.5]	32.3*** [25.8, 39.6]
\$25,001-\$50000	31.9 [25.2, 39.4]	28.8 [22.5, 35.9]	31.9 [24.9, 39.8]	28.1 [22.2, 34.8]
\$50,001-\$75000	34.1 [27.3, 41.6]	21.3** [16.6, 27.0]	27.4 [21.2, 34.7]	31.8 [25.4, 38.9]
More than \$75000	18.0 [13.0, 24.5]	3.8*** [2.2, 6.3]	8.0** [4.7, 13.3]	7.8** [4.9, 12.1]
Years since high school				
< 1 – 2 years	14.3 [9.8, 20.3]	8.8 [5.9, 12.9]	5.4** [3.0, 9.5]	3.1*** [1.5, 6.1]
>2–4 years	35.8 [29.0, 43.1]	24.1* [19.1, 30.0]	16.5*** [12.6, 21.3]	22.0** [17.0, 28.0]
>4–6 years	37.1 [30.4, 44.4]	43.4 [37.6, 49.4]	47.5* [41.0, 54.1]	39.9 [34.0, 46.2]
6–10 years	12.9 [8.0, 20.0]	23.6* [18.8, 29.3]	30.6*** [24.6, 37.4]	35.0*** [29.3, 41.1]
Overall health				
Excellent	27.8 [21.6, 35.1]	21.1 [16.3, 26.8]	23.6 [17.9, 30.4]	26.1 [20.8, 32.2]
Very Good	37.7 [30.7, 45.1]	29.2 [24.1, 35.0]	25.6** [20.4, 31.7]	32.2 [25.9, 39.3]
Good	26.0 [20.0, 33.0]	31.0 [25.5, 37.2]	25.1 [19.6, 31.6]	29.5 [23.8, 35.9]
Fair/Poor	8.5 [5.4, 13.1]	18.7** [14.6, 23.6]	25.7*** [19.8, 32.7]	12.2 [7.5, 18.9]
How well youth converses				
Not at all	17.1 [11.3, 24.8]	8.8 [3.1, 19.7]	3.1 [0.0, 39.5]	3.8 [0.3, 19.0]
Lot of trouble	29.8 [23.7, 36.6]	16.7* [9.3, 27.2]	6.2** [1.9, 15.6]	4.7** [1.0, 14.6]
Little trouble	40.4 [32.2, 49.2]	32.3 [24.2, 41.5]	24.5** [17.3, 33.2]	22.4** [15.4, 31.1]
No trouble	12.8 [8.4, 18.7]	42.2*** [32.7, 52.3]	66.3*** [56.8, 74.8]	69.1*** [60.7, 76.5]
Functional skills scale				
Lowest ability (8–11)	14.3 [10.1, 19.9]	8.0* [5.3, 12.1]	<i>a</i>	<i>a</i>
(12–19)	32 [23.5, 41.7]	22.4 [10.0, 40.9]	12.4 [0.3, 68.5]	7.7* [1.2, 26.1]
(20–27)	36.8 [27.9, 46.6]	47.7 [33.3, 62.4]	40.4 [18.5, 66.0]	37.4 [24.5, 52.0]
High Ability (28–32)	16.9 [11.5, 24.2]	21.9*** [15.2, 30.1]	47.3*** [33.8, 61.2]	54.9*** [43.8, 65.6]
Ever worked for pay	53.2 [44.0, 62.2]	62.6 [56.1, 68.6]	87.7*** [81.9, 91.8]	88.2*** [81.1, 92.9]
Health Insurance				

Covariate	Autism Spectrum Disorder	Mental Retardation	Emotional Disturbance	Learning Disability
Private/Other	33.8 [25.5, 43.1]	33.7 [24.6, 44.0]	46.6 [34.9, 58.5]	56.4** [42.9, 69.1]
Public	49.0 [39.1, 59.0]	36.2 [25.6, 48.1]	20.5*** [11.0, 33.8]	10.3*** [3.9, 22.3]
None	17.3 [10.7, 26.2]	30.1 [19.8, 42.4]	33.0* [22.8, 44.7]	33.3* [22.2, 46.3]

Source: National Longitudinal Transition Study 2.

Number of multiply imputed data sets = 50. Weighted to population levels. Variances adjusted for sampling method.

<sup>a</sup>No cell counts <3 cases were reported in accordance with the USDE data use agreement

\* p<.05,

\*\* p<.01,

\*\*\* p<.001

**Table 2**

Prevalence (%) of living arrangements among young adults who were no longer in high school at wave 5. Test of significance vs. the autism spectrum disorder group.

	<b>Autism Spectrum Disorder</b>	<b>Mental Retardation</b>	<b>Emotional Disturbance</b>	<b>Learning Disability</b>
<i>Since leaving high school, young adult ever lived...</i>				
...In a supervised living situation	11.8 [8.6,16.1]	6.1* [3.7,9.9]	6.9 [3.9,12.0]	2.8** [0.9,7.5]
...With a parent or guardian	87.1 [82.9,90.4]	78.0** [72.2,82.9]	63.5*** [56.9,70.0]	60.2*** [53.3,66.7]
...Independently	16.6 [11.1,24.2]	33.8*** [28.3,39.8]	61.8*** [53.1,69.8]	65.8*** [57.1,73.5]
<i>Has never lived elsewhere since high school (total continuity)</i>	79.1 [71.2, 85.3]	73.7 [67.2, 79.3]	47.8*** [40.2, 55.6]	50.3*** [42.4, 58.3]

\*  
p<.05,

\*\*  
p<.01,

\*\*\*  
p<.001

Source: National Longitudinal Transition Study 2, wave 5.

Number of multiply imputed data sets = 50. Weighted to population levels. Variances adjusted for sampling method

**Table 3**

Odds ratios and 95% confidence intervals of living arrangements since leaving high school among young adults compared to those with autism, controlling for covariates.<sup>a</sup>

	<b>Mental Retardation</b>	<b>Emotional Disturbance</b>	<b>Learning Disability</b>
<i>Since leaving high school, young adults ever lived...</i>			
...In a supervised living situation	0.7 [0.3,1.7]	0.9 [0.3,2.6]	0.3 [.07,1.4]
...With a parent or guardian	0.6 [0.3,1.1]	0.3*** [0.2,0.6]	0.3*** [0.1,0.6]
...Independently	2.2** [1.2,4.0]	5.3*** [2.8,9.9]	5.8*** [3.2, 10.6]
<i>Has never lived elsewhere since high school (total continuity)</i>	0.8 [0.4,1.4]	0.3*** [0.2,0.6]	0.3** [0.2,0.7]

\* p<.05,

\*\* p<.01,

\*\*\* p<.001

Source: National Longitudinal Transition Study 2, wave 5.

Number of multiply imputed data sets=50. Weighted to population levels. Variances adjusted for sampling method

<sup>a</sup>Covariates: gender, age, ethnicity, race, income, years since high school, overall health, how well youth converses, functional skills, ever worked for pay, health insurance type.



**Table 4**

Logistic regression models of living arrangements since leaving high school among young adults with an ASD (odds ratios, 95% confidence intervals)

Covariate	Ever lived under supervision since leaving high school	Ever lived with a parent or guardian since leaving high school	Ever lived independently or with a roommate since leaving high school	Has never lived elsewhere since leaving high school
Gender (female)	0.6 [0.2,1.6]	1.7 [0.7,4.5]	0.4 [0.1,1.4]	1.6 [0.5,5.2]
Age	1.1 [0.8,1.5]	1.0 [0.7,1.4]	1.3 [0.8,1.9]	0.7* [0.5,1.0]
Hispanic Ethnicity	0.5 [0.2,1.5]	3.1* [1.3,7.9]	1.5 [0.3,7.0]	0.8 [0.2,2.6]
Race (vs White)				
African American	0.5 [0.2,1.3]	2.3 [0.9,5.8]	0.2* [0.0,0.9]	2.2 [0.6,8.4]
Mixed/other	1.2 [0.4,3.8]	1.2 [0.4,3.9]	<i>a</i>	5.6* [1.5,21.6]
Parent or guardian household income, \$10,000 increments	1.0 [0.8,1.1]	1.0 [0.9,1.1]	1.3* [1.1,1.5]	0.9 [0.8,1.0]
Years since high school	0.8 [0.6,1.1]	1.2 [0.9,1.6]	1.4 [1.0,2.1]	0.8 [0.6,1.1]
Overall health	1.2 [0.8,1.7]	0.9 [0.6,1.2]	0.8 [0.5,1.2]	1.3 [0.9,1.8]
Functional skills scale	1.0 [0.9,1.1]	1.0 [0.9,1.1]	1.3*** [1.1,1.4]	0.9* [0.8,1.0]
How well youth converses	0.8 [0.4,1.4]	1.1 [0.6,2.0]	2.5* [1.2,5.2]	0.8 [0.5,1.3]
Ever worked for pay	1.7 [0.8,3.6]	0.8 [0.4,1.5]	2.3 [0.8,6.5]	0.7 [0.3,1.6]
Insurance (vs. private/other)				
Public	3.0* [1.0,8.5]	0.6 [0.2,1.4]	1.4 [0.4,4.4]	0.6 [0.2,1.4]
None	0.9 [0.2,4.1]	1.2 [0.3,4.4]	2.0 [0.6,7.1]	0.6 [0.2,2.0]

\* p<.05,

\*\* p<.01,

\*\*\* p <.001

Source: National Longitudinal Transition Study 2.

Number of multiply imputed data sets = 50. Weighted to population levels. Variances adjusted for sampling method.

<sup>a</sup>No cell counts <3 cases were reported in accordance with the USDE data use agreement.