

Running Head: PERSONAL FACTORS AND OUTCOMES

**The Impact of Personal Factors on Self-Determination and Early Adulthood Outcome
Constructs in Youth with Disabilities**

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Abstract

Data from the National Longitudinal Transition Study-2 (NLTS2) were used to examine the impact of three personal factors – race/ethnicity, gender, and family income – on self-determination (i.e., autonomy, psychological empowerment, self-realization) and early adulthood outcome constructs. Findings suggest for those with high incidence disabilities, family income predicts postsecondary education outcomes. And, males with high incidence disabilities have greater access to services and accommodations as adults, but lower use of financial supports (i.e., use of government support programs). African American youth across disability categories reported lower levels of financial independence. Females with intellectual disability reported greater social relationships, but lower levels of financial support and employment. Implications for future research, policy, and practice are discussed.

Researchers in field of secondary transition have developed recommendations for increasing the quality of research in the transition field (Mazzotti, Rowe, Cameto, Test, & Morningstar, 2013) including increasing the inclusion of students from diverse backgrounds in research and systematically analyzing differential impacts of predictors of postschool success for diverse student groups in correlational research. Trainor, Lindstrom, Simon-Burroughs, Martin, and Sorrells (2008) highlight the need to understand that diversity and cultural identities are defined by multiple factors, including gender, racial/ethnic identity, disability, and socio-economic status and that research and intervention development must consider these factors, as well as systems-level (e.g., school policy and organization) factors that impact outcomes.

The importance of research with diverse groups is highlighted by research findings, using data from the National Longitudinal Transition Study-2 (NLTS2), suggesting that racially/ethnically diverse youth with disabilities are less likely to be employed competitively after high school graduation, as are youth from lower socio-economic backgrounds (Wagner, Newman, Cameto, Garza, & Levine, 2005). Disability label also influences postschool employment. For example, in a young adults with intellectual disability have much lower rates of paid employment than other disability groups, particularly those with high incidence disabilities (e.g., specific learning disability, other health impairments) (Newman et al., 2011). Outside of employment, systematic differences based on gender, disability, race/ethnicity, and socioeconomic status have been found in postsecondary access and community inclusion (Newman et al., 2011).

Researchers have also systematically reviewed transition research to identify predictors of positive postschool outcomes for youth and young adults with disabilities (Test et al., 2009) One factor that has been identified as having a significant and positive impact on postschool outcomes is promoting and enhancing self-determination (Dattilo & Rusch, 2012; Lachapelle et

al., 2005; Mazzotti et al., 2013; Wehmeyer & Palmer, 2003; Wehmeyer & Schwartz, 1997). Shogren, Wehmeyer, Palmer, Rifenshield, and Little (2015) followed youth with disabilities who participated in a randomized control trial study of the impact of interventions to promote self-determination (Wehmeyer, Palmer, Shogren, Williams-Diehm, & Soukup, 2013). Youth that exited high school with higher levels of self-determination experienced more positive postschool community access and employment outcomes, although still less positive outcomes than their peers without disabilities. However, research also suggests that access to meaningful opportunities for the development of self-determination aligned with youth's cultural beliefs and values is limited for diverse youth in secondary school (Leake & Boone, 2007; Shogren, 2012; Trainor, 2005). Researchers have found that race/ethnicity and disability label impacts autonomy, psychological empowerment, and self-realization, three of four essential characteristics of self-determination (Shogren, Kennedy, Dowsett, Garnier Villarreal, & Little, 2014). For example, Hispanic youth tend to report lower levels of each of the constructs, and African American youth tend to report higher levels of autonomy than Hispanic youth. This body of research suggests the need for further research, as suggested by Mazzotti et al. (2013), that systematically explores impacts of personal factors on self-determination and early adult outcomes to inform policy and practice in secondary schools.

Purpose of the Study

Our purpose in the present study was to build on previous NLTS2 work and explore the impact of personal factors, namely disability, race/ethnicity, general and family income on autonomy, psychological empowerment, and self-realization and postschool outcomes for youth with diverse disability labels. Our primary research questions was: Does race/ethnicity, gender, and family income predict differences in self-determination (i.e., autonomy, psychological

empowerment, or self-realization) and postschool outcomes for students with high incidence disabilities (i.e., specific learning disability, emotional disturbances, speech or language impairments, and other health impairments), intellectual disability, and cognitive disabilities (i.e., autism, multiple disabilities and deaf-blindness)?

Method

Data Sources

We used data from NLTS2, building on previous analyses conducted to examine the impact of disability (Shogren, Kennedy, Dowsett, & Little, 2014) and race/ethnicity (Shogren, Kennedy, Dowsett, Garnier Villarreal, et al., 2014) on self-determination and postschool outcomes (Shogren, Shaw, & Little, in press) with the intent of examining additional personal factors that had not been examined in previous research. NLTS2 data was collected over a 10-year period (2000-2009), with a sample of approximately 1,250 students within each federally recognized disability category (i.e., autism, deaf-blindness, emotional disturbance, hearing impairment, learning disability, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, speech and language impairment, traumatic brain injury, and visual impairment). Students were sampled from districts stratified by geographic region, size, and community wealth, and were between the ages of 13 and 16 at the start of data collection. Multiple data sources were collected over five waves of data collection (each wave represents a two-year data collection period), one of which was the direct student assessment, which occurred once during Waves 1 or 2 while students were still in school for a subset of the sample (approximately 83%). The direct student assessment included a subset of questions from *The Arc's Self-Determination Scale* (SDS, Wehmeyer & Kelchner, 1995). Twenty-six items from three of the four subscales of *The Arc's Self-Determination Scale* (SDS, Wehmeyer & Kelchner,

1995). Shogren, Kennedy, Dowsett, and Little (2014) found that three (of four) essential characteristics of self-determination (autonomy, psychological empowerment, and self-realization) identified in the functional theory of self-determination (Wehmeyer, 2003) and measured on the SDS were adequately assessed in the NLTS2 data collection and latent constructs could be created. Shogren et al. (2014) also found that the 12 disability groups could be collapsed into six groups based on similarities in their patterns of latent self-determination means and variances and disability-related characteristics, including a high incidence disabilities group (specific learning disability, emotional disturbances, speech language impairments, and other health impairments), a sensory disabilities group (visual and hearing impairments), and a cognitive disabilities group (autism, multiple disabilities, and deaf-blindness) as well as three disability categories that could not be collapsed with any other group: intellectual disability, traumatic brain injury, and orthopedic impairments. The high incidence, cognitive, and intellectual disability groups defined by Shogren et al. (2014) were used in the present analyses as these were the largest disability groups, and had the greatest diversity in outcome constructs, discussed subsequently.

The adult outcome constructs used in the present analyses, were initially developed by Shogren et al. (in press). Shogren et al. (in press) used NLTS2 data collected during Wave 5 after young adults with disabilities exited school (ages 23-26) to develop and test ten early adult outcome constructs organized around indicators of quality of life (social relationships, independent living, emotional well-being, access to services, health status, postsecondary education, financial supports (i.e., use of government support programs), financial independence, employment, and advocacy). To develop the constructs, indicators from the NLTS2 parent/youth survey conducted after youth exited school was reviewed, and potential indicators

of the outcome constructs identified. The potential indicators were then subjected to empirical analysis using structural equation modeling, and constructs that had theoretical and empirical support (e.g., strong factor loadings, model fit, invariance across disability groups) were analyzed for differences across disability groups (Shogren et al., in press). Table 1 provides an overview of the 10 adult outcome constructs. Shogren et al. (in press) found that students with high incidence disabilities generally experienced more positive outcomes than students with intellectual, cognitive, or sensory disabilities. Shogren and Shaw (2016) then examined the degree to which three essential characteristics of self-determination (autonomy, psychological empowerment, and self-realization) predicted early adulthood outcomes, and found that autonomy tended to be the strongest predictor of adult outcomes. There were differences based on disability label; students with more severe disabilities tended to have weaker relationships between self-determination and outcomes. However, beyond disability label, no research has examined the impact of other personal factors on these adult outcomes, which is the purpose of the present analysis.

Sample

It is important to note there were differences in the sample used in the present analysis, compared to Shogren, Kennedy, Dowsett, and Little (2014) and Shogren et al. (in press). In the present analysis, we narrowed the NLTS2 sample to represent the three largest racial/ethnic categories, African American, Hispanic/Latino, and White to ensure sufficient power to analyze differences based on racial/ethnic group. Relatedly, we only targeted three (of six) disability groups from Shogren, Kennedy, Dowsett, and Little (2014) and Shogren et al. (in press) with the largest sample size when crossed with the racial/ethnic groups: high incidence (HIN; specific learning disability, emotional disturbances, speech or language impairments, and other health

impairments), cognitive disabilities (COG; autism, multiple disabilities and deaf-blindness) and intellectual disability (INT) groups. Participants who indicated “White” as their racial/ethnic group on the survey were used as the reference group in comparisons to respondents who indicated African American or Hispanic/Latino (w2_Eth6). Females served as the reference group for gender (w2_Gend2). Family income, a variable with 16 categories in increments of \$5,000, was included as a continuous predictor (np1K15Detail). In preparation for examining the research question, dummy variables were created for race/ethnicity and gender.

Missing Data

Because several of the adult outcome constructs used in the present analyses only applied to subgroups (e.g. employment questions were asked only of respondents who were employed), full information maximum likelihood (FIML) was used as the method to handle missing data. FIML generates estimates based only on what questions were answered rather than dropping incomplete records (e.g., list-wise deletion or imputing values as in multiple imputation) (Ender, 2010). Under an assumption of missing at random (MAR) data (i.e., wherein the propensity to respond is entirely predicted by the observed portions of the data), FIML will produce unbiased and optimally efficient parameter estimates (Enders, 2010; Schafer & Graham, 2002).

Analysis

As mentioned previously, the present study built on previous NLTS2 analyses and the starting point for the present analyses was the final model from the Shogren et al. (in press) including constructs representing the three self-determination constructs (autonomy, self-realization, and psychological empowerment) and the ten early adult outcome domains (see Table 1). As described in the Sample section, the sample differed slightly in the present analysis, necessitating invariance testing of the three self-determination and the ten quality of life outcome

constructs. After invariance testing, the additional variables related to race/ethnicity, gender, and family income were added to the model to explore our primary research question. All models were estimated using Mplus 7.0. Survey weights (variable “wt_na”), stratum, and cluster information was included by specifying complex analysis for the use of the robust maximum likelihood estimator (MLR). Multiple fit indices were used to evaluate overall model fit, including the root mean square error of approximation (RMSEA), the comparative fit index (CFI) and non-normed fit index (NNFI/TLI). RMSEA evaluates misfit in the covariances between the observed data and the model estimates (Brown, 2006).

Invariance constraints were tested and change in CFI was used to establish measurement invariance (Cheung & Rensvold, 2002). Nested model testing with χ^2 difference testing was used to evaluate differences in latent constructs and covariates. More specifically, each latent parameter was constrained to equality between two groups at a time, and model fit was then compared to the model without that constraint; if the χ^2 difference was significant for one degree of freedom, the null hypothesis that the models were the same was rejected. Nested model testing used loglikelihood values with the scaling factor correction in order to obtain corrected χ^2 values for the MLR estimator (Satorra, 2000). A cut-off of $p < .01$ was set a priori rather than $p < .05$ due to the large number of constructs in the model. All model constructs were evaluated for group differences at both the measurement and latent level, and then the impact of race/ethnicity, gender, and income for the constructs was examined.

Results

Measurement Invariance

Invariance testing results for the self-determination and adult outcome constructs across the three disability groups (high incidence, intellectual disability, and cognitive disability) who

reported their race/ethnicity as African American, Hispanic/Latino, and White were similar to those found in Shogren et al. (in press) with the larger sample of students. Specifically, model fit for the three self-determination constructs and ten adult outcome constructs was adequate (see Table 2). Weak invariance was established, in which factor loadings were equated across groups with a change in CFI = .005. When testing strong invariance (i.e., indicator intercepts equated across groups), similar to Shogren et al., two indicators were identified through nested model testing to have different intercept levels across the groups, one from the employment construct, and one from the social relationships construct. When these two indicators were constrained to equality for the intellectual and cognitive disability groups but freed to vary from high incidence disability estimates, partial invariance for the intercept model (strong invariance) was established with as few changes as possible made to the intercept constraints. Because these indicators were freed from the high incidence disability group, latent mean comparisons for employment and social relationships can only be made between the intellectual and cognitive disability groups.

Latent Differences

Differences in the latent factors (i.e., variances, correlations, and means) for the self-determination and adult outcome constructs across the three disability groups (high incidence, intellectual disability, and cognitive disability) who reported their race/ethnicity as African American, Hispanic/Latino, and White were then evaluated with nested model comparisons against the partial intercept model identified in the measurement invariance process. Most differences in latent factors were similar or identical to those reported in Shogren et al. (in press), although there were some differences that emerged based on the differing samples used in the two analyses, suggesting the influence of disability label and race/ethnicity on the pattern of results. As shown in Table 3, in the present analyses, approximately one-third of the latent

variance estimates were identified as differing across groups with most of the differences appearing between the high incidence group and one of the other groups. Generally, those with high incidence disabilities tended to show higher variability in autonomy, financial independence, and advocacy; and lower variability in independent living outcomes and postsecondary outcomes. Participants with intellectual disability showed wider variability in living independently and less variability in post-secondary education outcomes when compared to participants in the cognitive disability group. As shown in Table 4, there were limited differences in latent correlations across the groups with only 9 of 105 (9%) comparisons identifying group differences. As with latent variances, the differences were concentrated in comparisons of the high incidence disability group and one of the other groups. Furthermore, all but one group difference was between high incidence and cognitive disability group, with students with high incidence disabilities generally having higher correlations between constructs, suggesting stronger relationships between constructs in this population.

Finally, when examining differences in latent means via nested model comparison for 26 latent mean pairs, the three disability groups showed significant differences from each other in specific outcome constructs, similar to Shogren et al. (in press), although differences continued to emerge that were unique to the present sample. More than half of the latent mean comparisons (60%) showed differences. Based on Cohen's D, effects sizes for the differences were calculated based on this formula, and are reported in Table 5:

$$d = \frac{(\alpha_1 - \alpha_2)}{\sqrt{\varphi_{pooled}}}$$

The largest mean differences were found between those with high incidence disability and the other groups. For example, young adults with high incidence disabilities tended to report greater financial independence but lower financial supports (i.e., use of government programs). Students

with high incidence disabilities also tended to report greater psychological empowerment and emotional well-being, as well as greater independent living and post-secondary education outcomes. Students with high incidence disabilities did, however, report engaging in lower levels of advocacy and having less access to accommodations. Students with intellectual and cognitive disabilities tended to score more similarly, with the exception of those with intellectual disability reporting higher autonomy and independent living outcomes, and lower financial independence and access to postsecondary education.

The differences in the financial support construct between the high incidence and intellectual disability groups in the present analysis (-1.15) and between the high incidence and cognitive disability group (-1.31) was much larger than that found in the Shogren et al. (in press) sample which included all disability groups and race/ethnicities, again suggesting sample-related differences influenced by disability and race/ethnicity. Further, statistically significant mean differences disappeared for employment and when comparing the high incidence disability group to the other groups on independent living in the present analyses.

Impact of Race/Ethnicity, Gender, and Family Income

Table 6 provides an overview of the key findings, and the significant findings are discussed in the following section for each personal factor.

Race/ethnicity. When compared to young adults across the disability groups (HIN, INT, COG) who reported their race/ethnicity as White, participants who reported their race/ethnicity as African American reported lower levels of financial independence and lower advocacy levels in the cognitive disability group. Access to postsecondary education was higher in African American respondents in the high incidence disability group than in the intellectual and cognitive disability groups. No differences were identified within in the high incidence disability group

between Hispanic/Latino and White respondents. Social relationship outcomes were lower for respondents who were Hispanic/Latino within the intellectual and cognitive disability groups as compared to respondents who were White. Hispanic/Latino respondents with intellectual disability reported higher levels of financial support and employment than White respondents.

Gender. No consistent patterns were identified based on gender. Males in the high incidence disability group reported lower levels of financial support than females but higher levels of services and accommodations. In the intellectual disability group, males reported higher levels of financial support and employment and lower levels of social relationships when compared to females. Higher levels of employment and advocacy were reported by males in the cognitive disability group when compared to females in that same group.

Income. Across all three disability groups, income was a positive predictor of financial independence suggesting its impact for students with high and low incidence disabilities. Income also predicted post-secondary education for participants in the high incidence disability group.

Discussion

The purpose of the present analysis was to build on previous NLTS2 research and to broadly examine the impact of three personal factors – race/ethnicity, gender, and family income – that had not been examined systematically in previous research on self-determination and early adulthood outcomes. The intent was to inform policy and practice related to secondary transition services and supports, as well as provide direction for future research. By understanding the personal factors that shape one’s cultural identity (Trainor et al., 2008) and influence self-determination and adult outcomes, considerations that should be embedded into individualized transition services and supports can be identified, implemented and further researched. Specifically, by better understanding these factors, interventions and supports can be

individualized based on cultural identities, as a limited body of research has done (Valenzuela & Martin, 2005).

Implications for Research and Practice

Consistent with previous work, the findings suggest that for students with high incidence, intellectual, and cognitive (i.e., autism, multiple disabilities and deaf-blindness) disabilities ongoing work is needed to enhance self-determination and to promote valued postschool outcomes. Specific attention should be directed to examining the implementation and outcomes of interventions to promote self-determination in secondary schools, particularly across racial/ethnic groups. The present analysis confirms differences in self-determination constructs and early adult outcomes based on membership in differing disability and racial/ethnic groups, and research on the factors that shape these differences to inform practice is needed.

The present findings suggest that, generally – across diverse youth - those with high incidence disabilities tend to report more positive outcomes, with greater access to postschool employment and independent living opportunities. Further, this group shows greater variability in their outcomes, suggested that a greater range of options are experienced by these groups. The greater range of experiences available to youth with high incidence disabilities, suggests the criticality of policy and practice that promote access to and experiences in integrated employment and living options for secondary youth with more severe disabilities. The importance of these experiences is confirmed by other national data (Hart, Grigal, & Weir, 2010; Siperstein, Parker, & Drascher, 2013) that suggests those with intellectual and cognitive disability tend to have lower rates of employment, independent living, and postsecondary education and there is less variability in outcomes. Evidence-based practices for promoting transition to employment and postsecondary education exist that can be implemented in

secondary schools (Test et al., 2009), and the present findings suggests that such practices need to be available and accessible to all students to enhance outcomes.

Interestingly, those with intellectual and cognitive disability reported higher levels of financial support, but lower levels of financial independence. This confirms the frequently discussed limitations of government benefits related to employment and the creation of financial capital (Soffer, McDonald, & Blanck, 2010), and suggests the need for ongoing focus on creating opportunities for competitive employment for people with intellectual and cognitive disabilities and promoting school-based employment opportunities and experiences that are linked with positive postschool employment opportunities for youth with intellectual and cognitive disabilities (Test et al., 2009).

Beyond disability-related findings, a major contribution of the present analysis, was extending knowledge of the impact of other personal characteristics on self-determination and postschool outcomes. Although a limitation of the present analysis is only analyzing three additional factors – race/ethnicity, gender, and family income – which do not capture all the diverse factors that may shape one’s personal culture (Trainor et al., 2008), the results do provide preliminary information to guide future research, policy, and practice. For example, as might be expected from other research (Sima, Wehman, Chan, West, & Leucking, 2015; Stoneman, 2007; Wang et al., 2004), family income played a role, irrespective of disability label, on financial independence. Further, for those with high incidence disabilities, but not low incidence disabilities such as cognitive and intellectual disability, family income also predicted postsecondary education outcomes. The data did not allow for a systematic analysis of the factors that shaped this relationship (e.g., greater ability to provide financial support – outside of government programs – for college or greater ability to access supports for accommodations),

but it suggests that above and beyond financial support through government programs, family resources are a stronger predictor of access to and success in high education. Further research is needed to more systematically examine these findings and alternative asset building programs (Soffer et al., 2010), as well as to explore, given the increase in the prevalence of postsecondary programs for people with intellectual and cognitive disability (Hart et al., 2010), the impact of family and government resources on access to these programs. Considering ways that access to and knowledge of these programs can be developed in secondary education and transition services has the potential to enhance practice and the ability of youth to transition to adulthood with the financial supports in place that enhance valued postschool outcomes.

In addition to family income, there were also associations between a person's reported race/ethnicity and postschool outcomes. Shogren, Kennedy, Dowsett, Garnier Villarreal, et al. (2014) identified mean-level differences in self-determination constructs based on race/ethnicity, and the present analysis adds to those findings by providing additional details on the impact of race/ethnicity on postschool outcomes. For example, the present analyses found African American young adults reported lower levels of financial independence, consistent with other research (Fujiura & Yamaki, 1997; Fujiura, Yamaki, & Czechowicz, 1998). Work is also needed to develop and evaluate interventions in secondary schools that target enhanced self-determination and financial resource development for diverse students and families. Hispanic/Latino youth in the intellectual and cognitive disability groups tended to report fewer social relationships, but high levels of financial support, highlighting the importance of building not only paid, but also natural supports for this population in adulthood. Research is also needed examining how various peer support and other relationship-focused interventions (Carter, Cushing, Clark, & Kennedy, 2005) in secondary schools can use culturally-responsive practices

to build social capital in schools and communities to promote valued self-determination and postschool outcomes.

As mentioned previously, there were no consistent gender differences; but males did tend to report, in the high incidence disability group, greater access to services and accommodations and lower use of financial supports, perhaps indicating any ability to access accommodations in postsecondary and work environments independent of paid services and supports. For those with intellectual disability, females reported greater numbers of social relationships, but lower levels of financial support and employment, suggesting stronger social supports but less access to employment opportunities (Olson, Cioffi, Yovanoff, & Mank, 2000). Employment was also more frequent for males with cognitive disabilities, again suggesting ongoing gender-based disparities. Further work is needed to explore the degree to which these outcomes are shaped by gender-related stereotypes or planning practices that may be reinforced in schools, and can be targeted with policy and practice that directly address gender. This also highlights the need for future research to jointly examine personal and environmental factors.

Overall, the findings suggest that there is a relationship between a variety of personal factors (i.e., disability, race/ethnicity, family income, gender) and outcomes, and emphasize that looking at any one of these factors in isolation will not provide a full picture of the complex contextual factors that impact outcomes (Shogren, Luckasson, & Schalock, 2014). Further, this work looked at a restricted range of personal factors, certainly not all factors that can define one's personal culture, and did not examine the interactive role of the environment in shaping outcomes. Future work is critically needed applying an ecological perspective (Bronfenbrenner, 1979, 2005) to research on the development of interventions and policy to support implementation that addresses these factors concurrently and comprehensively. Further research

is also needed to more specifically analyze the patterns of relationships of personal factors with specific outcome constructs (e.g., employment, postsecondary education), to further understand the unique influences within each construct. However, the findings continue to confirm that there are disability-related disparities in outcomes for youth and young adults with disabilities, and as well as disparities influenced by race/ethnicity, gender, and family income that must be addressed through culturally responsive practices. Again, however, these disparities are simultaneously influenced by the multiple factors that define one's personal culture and differ across outcome domains. Given this, work is also needed to explore protective factors and well as risk factors. The findings highlight, that particularly for those with high incidence disabilities compared to those with intellectual and cognitive disabilities, there is a large amount of variability in outcomes (although this variability is still skewed to more youth having less than optimal outcomes) and that in some circumstances certain groups, such as African Americans youth with high incidence disabilities are actually reporting greater access to postsecondary environments, although again, this may be an artifact of the sample and the population that was retained in the NLTS2 sample over time. Perhaps, however, youth that are provided with access to these opportunities are more likely to have generalized benefits. Identifying protective factors that enable youth from diverse backgrounds to use their self-determination to shape the adult outcomes they desire is a critical area for future research to enable practitioners to build on these protective factors and address risk factors (Trainor, 2008; Trainor et al., 2008).

Limitations and Directions for Future Research, Policy, and Practice

The same limitations that characterize all secondary data analysis of NLTS2 and other large national datasets applies to the present analyses (Mazzotti et al., in press; Shogren & Shaw, 2016; Shogren et al., in press). First, using survey data to define latent constructs on a post hoc

basis, when the variables were not originally selected to be representative of latent constructs is a challenge and limits the ability to include all constructs that might be of interest or included in a given theoretical perspective. As described in Shogren et al. (in press) with regard to the adult outcome constructs and Shogren, Kennedy, Dowsett, and Little (2014) with regard to the self-determination constructs included in the present analysis, the full range of quality of life domains and essential characteristics of self-determination could not be represented using the questions in NLTS2. Although efforts were made to select the most representative variables to define latent constructs, the included constructs do not fully meet the definitional criteria present in the literature for the constructs. Further, the sample included in the present analysis was restricted to those who were able to participate in the direct student assessment (approximately 83% of NLTS2 sample) and those that reported race/ethnicity of White, African American, or Hispanic/Latino and were classified as having a high incidence, intellectual, or cognitive disability based on previous work with the self-determination constructs. As described in the results section, this more restricted sample led to slight differences in the outcomes particularly when testing latent differences compared to Shogren, Kennedy, Dowsett, and Little (2014) where all disability categories and race/ethnicities included in the NLTS2 sample were part of the analyses. Further, the disability grouping and the terminology used to describe these groupings (e.g., cognitive disability) was defined in previous analysis. Alternate groupings or descriptions of the groupings might be possible, and were not tested in this study. Thus, the sample and the grouping of the sample must be considering in interpreting the analyses. Overall, the findings confirm that impact of sampling for specific characteristics on findings, and the need for research with other disability and racial/ethnic groups as very limited research has examined factors that influence outcomes across disability groups in other racial or ethnic groups (Leake & Boone,

2007). Specifically, sampling plans in large policy studies must be developed to allow for sub-analyses of small disability and racial/ethnic groups, as this was not possible in the present analysis because of the small nature of some of the additional racial/ethnic groups represented in the sample (e.g., Asian American, Native American/Pacific Islander). Additionally, the fact that the start of NLTS2 data collection was over 15 years ago (2000), must be considered in interpreting these findings, and as there have been multiple changes in society and in schools since the early 2000s when data collection began, updated data is needed to further explore current student experiences.

Each of these limitations, however, confirms the need for further research exploring the best ways to understand the diverse personal and environmental factors that impact outcomes. While the focus in the present analyses is on looking, broadly, at the pattern of relationships between personal factors, self-determination, and adult outcome constructs, future work is needed that more specifically analyzes the pattern of relationships between specific factors and outcome areas. Only then can frameworks for meaningfully using this information in policy and practice be developed to guide transition planning that is individualized to the needs of each adolescent with a disability to meaningfully impact outcomes.

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Table 1

Adult Outcome Constructs (adapted from Shogren & Garnier Villarreal, 2015; Shogren et al., in press)

Adult Outcome Constructs	Brief Description of NLTS2 data
1. Social Relationships	Reported participation in community, volunteer, and group activities; frequency of invitations to social activities, talking on phone, engaging in social activities; feeling supported and cared about by friends and family
2. Independent Living	Type and inclusiveness of current residential arrangement (e.g., independent or supported living arrangements vs. congregate or segregated settings)
3. Emotional Well-Being	Ratings of the degree to which young adults enjoy life, are happy, feel good about themselves, and feel useful and able to get things done
4. Access to Services	Rating of need for services beyond what is current available
5. Health Status	Rating of general health status
6. Postsecondary Education	Enrollment in any form of postsecondary education; duration and continuity of attendance; graduation status
7. Financial Supports	Receives financial support from government sources, including SSI, food stamps or any government program
8. Financial Independence	Reports having checking, savings, and charge account
9. Employment	Employment status, duration and consistency of employment, number of hours worked, access to benefits, if promoted at current job, perceptions of treatment, compensation, and opportunities for advancement at current job
10. Advocating for Needs	Reports communicating needed accommodations to employer

Table 2

Measurement invariance testing results

Invariance tests	χ^2	df	RMSEA	90% CI	CFI	NNFI
Configural	2947.17	1461	0.030	0.028 – 0.031	0.833	0.796
Loadings	3036.25	1505	0.030	0.028 – 0.031	0.828	0.796
Intercepts	3300.84	1549	0.031	0.030 - 0.033	0.803	0.773
Intercepts (partial)*	3178.09	1547	0.030	0.029 – 0.032	0.816	0.788

* Parceled indicator emotw in employment constrained to equality intellectual and cognitive disability groups, and parceled indicator srirs in social relationships constrained to equality for those same two groups.

Table 3

Latent Variance Differences between Groups

Construct	Disability	Disability	Variance	Variance	Ratio	$\Delta\chi^2*$
	Group 1	Group 2	Group 1	Group 2		
Autonomy						
	HIN	COG	1.000	1.713	1.713	20.51
Financial Support						
	HIN	INT	1.000	2.837	2.837	10.50
	HIN	COG	1.000	3.070	3.070	18.00
Advocacy						
	HIN	INT	0.674	1.013	1.503	141.87
	HIN	COG	0.674	0.953	1.414	108.56
Living Situation						
	HIN	COG	0.500	0.364	0.728	15.39
	INT	COG	0.457	0.364	0.796	8.41
Post-secondary Education						
	HIN	INT	0.341	0.201	0.589	23.82
	INT	COG	0.201	0.330	1.642	21.15

* All $\Delta\chi^2$ values for the nested model tests were evaluated with 1 degree of freedom and found to have $p < .005$.

Note: HIN = High Incidence Disability Group; COG = Cognitive Disability Group; INT = Intellectual Disability Group.

Table 4

Latent Correlation Differences Between Groups

Correlation	Disability Group 1	Disability Group 2	Group 1 Correlation	Group 2 Correlation	Differences
Autonomy – Financial Independence					
	HIN	INT	0.353	-0.034	0.387
	HIN	COG	0.353	-0.130	0.483
Autonomy – Employment					
	HIN	COG	0.304	-0.055	0.359
Autonomy – Postsecondary Education					
	HIN	COG	0.234	0.020	0.214
Employment – Emotional Wellbeing					
	HIN	COG	0.539	0.179	0.360
Self-Realization – Advocacy					
	HIN	COG	-0.106	-0.404	0.298

Note: The Difference column is computed by Group 1 Correlation – Group 2 Correlation; HIN =

High Incidence Disability Group; COG = Cognitive Disability Group; INT = Intellectual

Disability Group

Table 6

Latent Mean Differences between Groups

Disability Group 1	Disability Group 2	Mean Group 1	Mean Group 2	Cohen's D
Autonomy				
INT	COG	0.178	-0.317	0.242
Self-Realization				
HIN	COG	0.000	-0.309	0.252
Psychological Empowerment				
HIN	INT	0.000	-0.692	0.593
HIN	COG	0.000	-0.974	0.757
Financial Independence				
HIN	INT	0.000	-0.916	0.847
HIN	COG	0.000	-0.412	0.360
INT	COG	-0.916	-0.412	-0.343
Financial Support				
HIN	INT	0.000	1.469	-1.150
HIN	COG	0.000	1.932	-1.314
Emotional Wellbeing				
HIN	INT	0.000	-0.394	0.353
HIN	COG	0.000	-0.432	0.368
Advocacy				
HIN	INT	0.324	1.118	-0.837
HIN	COG	0.324	1.337	-0.995
Independent Living*				
INT	COG	0.303	0.150	0.147
Services and Accommodations				

HIN	COG	0.342	0.520	-0.219
Post-secondary Education				
HIN	INT	0.326	0.083	0.391
HIN	COG	0.326	0.246	0.117
INT	COG	0.083	0.246	-0.187

* Only the test comparing Independent Living between INT and COG was reported because all indicator intercepts were constrained to equality for these two groups.

Note: HIN = High Incidence Disability Group; COG = Cognitive Disability Group; INT = Intellectual Disability Group

Table 5

Role of Race/Ethnicity, Gender and Income on Latent Outcomes

Constructs	African American		Hispanic/Latino		Male		Income	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
<u>High Incidence Disability</u>								
Financial Independence	-0.300*	0.095					0.284*	0.063
Financial Support					-0.253*	0.079		
Post-secondary Education	0.157*	0.049					0.170*	0.057
Access to Services					0.140	0.056		
<u>Intellectual Disability</u>								
Financial Independence	-0.304*	0.097					0.235	0.114
Financial Support			0.589	0.334	1.361*	0.522		
Employment			0.578	0.321	1.447*	0.518		
Social Relationships			-0.319	0.189	-0.608	0.338		
<u>Cognitive Disability</u>								
Financial Independence	-0.354*	0.085					0.338*	0.073
Employment					0.188*	0.072		
Social Relationships			-0.179	0.072				
Advocating for Needs	-0.222*	0.074			0.177	0.072		