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Effect of Self-Determination on Postsecondary Enrollment of English Learners With Disabilities

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Abstract

We examined the effect of three components of self-determination—autonomy, empowerment, and self-realization—on the postsecondary enrollment of English learners with disabilities, using quasi-experimental propensity score modeling and data from the U.S. National Longitudinal Transition Study-2. Results support the hypothesis that self-determination components affect postsecondary school enrollment. English learners with disabilities with higher autonomy scores were more likely to enroll in 2-year colleges, and those with higher empowerment scores were more likely to enroll in 4-year colleges. However, prior research found that English learners with disabilities are less likely to act autonomously or report empowerment-related behaviors than other students with disabilities or students in the general population. Considering the increasing importance of postsecondary education, the current study's findings demonstrate the importance of promoting both the self-determined behaviors of this dually identified population of students and the learning environment supports that facilitate the practice of self-determination.

Keywords

English language learners, exceptionalities, quantitative, research methodology, self-advocacy/self-determination, transition

The U.S. Bureau of Labor Statistics' occupational projections forecast that by 2024 approximately 73% of the 15 fastest-growing occupations will require an associate or a bachelor's degree (Hogan & Roberts, 2015). As the number of occupations requiring some form of higher education continues to grow, postsecondary enrollment becomes increasingly important for all students. The advantages of a postsecondary education may be particularly critical for English learners[1] (ELs) with disabilities. ELs with disabilities are students who receive special education services as an individual with a disability and who, as defined by the *Glossary of Education Reform, "*are unable to communicate fluently or learn effectively in English, who often come from non-English-speaking homes and backgrounds, and who typically require specialized or modified instruction in both the English language and in their academic courses" (Great Schools Partnership, 2013). ELs with disabilities are disproportionately likely to face multiple barriers, including those associated with race-, class-, and linguistic-based marginalization and discrimination, as well as poverty and under-resourced education settings (Hussar et al., 2020; Trainor et al., 2019).

The school population of ELs with disabilities is growing (National Center for Education Statistics [NCES], 2020). Almost 5 million ELs are enrolled in public school Grades K through 12 (NCES, 2020). Of those, 14.7%, or approximately 700,000 are ELs with disabilities (U.S. Department of Education, 2019). According to the most recent national study of secondary students with disabilities, the National Longitudinal Transition Study 2012 (NLTS 2012), 10% of secondary students with disabilities are ELs (Liu et al., 2017).

Findings based on NLTS 2012 demonstrate that ELs with disabilities, as well as their parents, hold high expectations for postsecondary education, with 73% of students and 66% of their parents expecting that the student would attain a postsecondary degree (Trainor et al., 2019). Despite these high expectations, ELs with disabilities are significantly less likely than their general population peers to have ever enrolled in a 2-year or 4-year postsecondary education institution (Newman et al., 2011; Trainor et al., 2016).

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The ever-increasing importance of postsecondary education and the disconnect between expectations and enrollment rates point to the importance of identifying malleable factors linked to the higher likelihood of postsecondary enrollment for ELs with disabilities. Factors that have demonstrated consistent evidence as contributors to postsecondary enrollment for other groups of students are components of self-determination (e.g., Cobb et al., 2009; Mazzotti et al., 2021). Research based on secondary analysis of National Longitudinal Transition Study-2 (NLTS2) indicated that having higher levels of psychological empowerment increased the odds of enrollment in both 2-year/community colleges and 4-year universities, and higher levels of autonomy increased the likelihood of enrollment in 4-year university and career/technical education programs for students with disabilities as a group (Petcu et al., 2017). The relationship of the self-determination components measured in NLTS2 and postsecondary enrollment also demonstrated that higher levels of empowerment and autonomy were associated with a higher likelihood of enrollment in 2-year and 4-year colleges for youth receiving Supplemental Security Income benefits (Berry et al., 2012). In addition, self-determination has been associated with the continued academic success of students with disabilities enrolled in postsecondary schools (e.g., Getzel & Thoma, 2008; Ju et al., 2017). To learn whether there is a link between components of self-determination and postsecondary education for ELs with disabilities and to extend the methodological focus of existing analyses, this article addresses the impact of three self-determination components—autonomy, empowerment, and self-realization—on the postsecondary school enrollment of ELs with disabilities, using the quasi-experimental propensity modeling methodology.

Self-determination refers to "the attitudes and abilities required to act as the primary causal agent in one's life and to make choices regarding one's actions, free from undue external influence or interference" (Wehmeyer, 1992, p. 305). Self-determination is a multifaceted and complex concept (Cobb et al., 2009). Wehmeyer and colleagues (2003) identified four essential components of self-determination, specifically, that the individual (a) acts autonomously; (b) initiates and responds to events in a psychologically empowered manner; (c) acts in a self-realizing manner; and (d) acts with behaviors that are self-regulated. Three of these components—autonomy, empowerment, and self-realization—were measured in the NLTS2 study, the only nationally representative study of secondary students with disabilities with postsecondary outcome data. Autonomous behavior is the ability to take direct action based on authentic interests, values, and desires; to make decisions independently based on one's own judgment (Deci & Ryan, 1985). Self-realization refers to the knowledge of one's strengths and limitations; a self-understanding formed through prior experiences, as well as influences from significant others (Wehmeyer, 1997). Psychological empowerment is one's belief in the ability to achieve a desired outcome based on an internal locus of control and a sense of self-efficacy (Zimmerman, 1990). These three components of self-determination examined in the current study are interconnected in the sense that knowledge of one's self (i.e., What is my goal?) is a prerequisite to behaving in such a way that connects this knowledge to action (i.e., What can I do to achieve my goal?) and prompts reflection (How did I do in achieving my goal?)

Causal agency forms a framework for our examination of self-determination. This theoretical framework is focused on how individuals become causal agents and therefore more self- rather than other-determined (Shogren et al., 2015; Wehmeyer, 2004). To act with agency requires the mental or physical capacity to respond to opportunities or threats/challenges. Causal agency theory posits that "people who are causal agents respond to challenges . . . to their self-determination by employing causal and agentic capabilities that result in causal action and allow them to direct their behavior to achieve . . . the desired change" (Wehmeyer, 2004, p. 356). Both Wehmeyer's Causal Action Schema and Shogren's "layers" of human agency indicate several points where instructional and environmental supports and interventions could be created to promote increased self-determination, including instructional interventions (e.g., teaching self-determination), environmental modifications (e.g., carrying out culturally sustaining approaches to family participation), and opportunities for practice (e.g., supporting students' goal setting).

Of interest in this study is a particular group of students with disabilities, those who receive English language services in school. Although ELs with disabilities share the experience of using multiple languages at home, they are a diverse group of individuals in terms of home language, multilingual proficiencies, immigration, cultural identities, and social, historical, and political experiences in relation to the larger, dominant U.S. society. Self-determination theorists Deci and Ryan (1985), foundational to Wehmeyer's and Shogren's work, argued that self-determination is a universal human need contributing to the quality of life. This large body of scholarship provides an empirically supported differentiation between autonomy, a key component of self-determination, and both individualism and independence (Chirkov et al., 2003). Humans' practice of autonomy varies according to their preferences and opportunities to engage with others on continua of collectivism and individualism, as well as interdependence and independence. Based on research with different ethnicities residing in the United States and with people of different nationalities, Deci and Ryan conclude that autonomy is a universal component of self-determination that allows for people to act in

ways along these continua that are representative of their cultural identities and their cultural positions in the larger societies in which they live.

This framing of self-determination and its components helps to explain the construct's importance in relation to postschool outcomes. Shogren (2011) came to a similar conclusion based on a systematic literature review. Qualitative interviews of adolescents with disabilities (Trainor, 2005, 2007) and parents (Shogren, 2012), which included multilingual participants, also support that people of diverse racial and cultural identities strive for self-determination as defined by their cultural in-groups. More recently, Shogren and colleagues (2014, 2018) have found that when measuring self-determination in adolescents with disabilities, variation does occur when disability and race/ethnicity are considered together. Some of this variation, however, can be at least partially explained by the environmental characteristics associated with the settings in which adolescents with disabilities from across race/ethnicity, disability, and gender enact self-determination (Cavendish, 2017; Rodriguez & Cavendish, 2013).

Findings based on secondary analysis of NLTS 2012 indicate that the self-determination characteristics of ELs with disabilities differed significantly from those of other students (Newman et al., 2021). On average, ELs with disabilities reported lower levels of empowerment, autonomy, and to a lesser extent, self-realization than other students, including their peers with disabilities, as well as non-EL and EL students in the general population. Highlighting the salience of disability, most self-realization item-level differences were between ELs with disabilities and ELs in the general population. In addition, ELs with disabilities were less likely than ELs in the general population to report autonomous and empowerment-related behaviors.

In addition to differences in self-determination characteristics, ELs with disabilities differ from other students in several ways (Trainor et al., 2019), including disability identification, with significantly higher incidence of learning disabilities and lower incidence of autism, emotional disturbances, other health impairment, and traumatic brain injury. They also are more likely to have parents who had not completed high school, with almost half of ELs with disabilities in households led by parents who have less than high school education. In addition, ELs with disabilities are more likely to experience poverty and to attend urban, poor-performing schools.

Research focused on identifying characteristics associated with variations in the self-determination of ELs with disabilities, based on analysis of the NLTS 2012 data set, found that gender and disability category were related to components of self-determination of ELs with disabilities (Newman et al., 2021). When holding other characteristics constant, female ELs with disabilities reported lower levels of empowerment than males, and ELs with autism had lower empowerment and self-realization scores than did ELs with learning disabilities. These findings are consistent with those of other studies. For example, as measured on The Arc's Self-Determination Scale, students with autism or intellectual disabilities tend to receive lower scores on the empowerment and autonomy subscales (Wehmeyer, 2000). Students with learning disabilities have scored higher on these subscales (Chou et al., 2017; Wagner et al., 2007). Research also suggests a relationship between socioeconomic status, including household income and parents' educational level, and self-determination (Zhang, 2005).

Few studies address the preferences, strengths, and needs in the transition to postsecondary education of secondary school students who are dually identified as ELs with disabilities (Burr et al., 2015; Trainor et al., 2016). What is known, however, is that there is room for improving postsecondary education enrollment for this group of high school students. There also is consistent evidence that components of self-determination are contributors to successful post-school outcomes for young adults, including increased postsecondary enrollment and perseverance (e.g., Mazzotti et al., 2021; Shogren et al., 2017; Shogren & Shaw, 2016); although, much of this evidence is based on correlational analyses. Given the importance of postsecondary education and the potential of self-determination to improve postsecondary outcomes for other groups of students, we asked, what is the effect of three components of self-determined behavior—autonomy, empowerment, and self-realization—on the postsecondary education enrollment of ELs with disabilities? Based on the hypothesis that these behaviors increase the likelihood of postsecondary enrollment, we examined this question using quasi-experimental propensity score modeling (PSM) methodology and data from the NLTS2.

Method

This secondary analysis utilizes data from NLTS2, a precursor to the more recent NLTS 2012, because the NLTS 2012 study does not yet provide outcome data pertaining to postsecondary education enrollment. Both studies are funded by the U.S. Department of Education. The NLTS2 data provide an important (and currently singular) opportunity to begin to identify the high school experiences linked to postsecondary success for English learners with disabilities, based on nationally representative data.

The NLTS2 two-stage sampling strategy first randomly sampled 540 local educational agencies (LEAs) and state-supported special schools (e.g., schools for the deaf) stratified by geographic region, district enrollment, and wealth. Then students receiving special education services were randomly selected from sample LEA and school rosters.

The initial NLTS2 sample comprised more than 11,000 secondary school students in Grades 7 and above, ages 13–16. All received special education services representing each of the 12 federally recognized disability categories.

The NLTS2 database includes data from phone interviews and/or surveys of parents and youth across five waves of data collection, high school transcripts, teacher surveys, and direct assessments of students' academic achievement. By the final data collection, youth were 21–25 years old. Sample selection, sample attrition, and representativeness were more fully described by SRI International (2000) and Javitz and Wagner (2003, 2005). NLTS2 data yield nationally representative estimates of students with disabilities, including students who were ELs with disabilities. Details on the weighting strategy can be found in Valdes et al. (2013).

Data Sources

Computer-assisted telephone interviews were conducted with parents in English and Spanish every other year between 2001 and 2009. Surveys were mailed to parents who were unreachable by phone and to young adults who were reported to be able to answer questions for themselves but not by phone. Youth also were interviewed in person at the conclusion of a direct assessment of their academic skills, during the data wave they were between 16 and 18 years old. Youth whose teachers considered them able to participate in the direct assessment were administered in-person interviews. The in-person interviews included The Arc's Self-Determination Scale (Wehmeyer, 2000) items. High school transcripts were collected between March 2002 and September 2009. For details on all data sources, see Newman et al. (2011).

ELs With Disabilities Sample

The present study's sample included students as ELs with disabilities whose high school transcript indicated English as a second language (ESL) or bilingual courses, or whose Wave 1 or Wave 2 School Program Survey indicated that the student participated in bilingual education for students who were English language learners (item npr12A2c) and/or were bilingual, Limited English Proficient, or non-English speaking (item npr12B1). After the initial NLTS2 sample of ELs was created, proportions of ELs in each disability and demographic category were compared with those in the NLTS 2012 study—the most recent, ongoing national study. EL status in NLTS 2012 was provided by school districts. The comparison revealed that the initial NLTS2 EL sample included a disproportion of students with hearing impairments (33% in NLTS2 vs. 9% in NLTS 2012). Based on the likelihood that school survey respondents conflated sign language use with English language proficiency, we deleted from the sample those students whose parents reported that they solely used sign language, unless their transcript indicated they had taken ESL courses. The resulting proportion of students with hearing impairment in the NLTS2 sample did not significantly differ from that in NLTS 2012. There were approximately 580 EL students with disabilities in the NLTS2 sample. Of those, approximately 400 had at least one post-high school parent/youth interview survey with post-secondary enrollment status and approximately 360 had an in-person interview that included the self-determination items. The current study's sample limited participants to those for whom an in-person interview with the self-determination items was available and for whom postsecondary education enrollment status was known. The resulting sample included approximately 230 ELs with disabilities. All reported sample sizes are rounded to the nearest 10, per Institute of Education Sciences reporting requirements for a restricted data set.

Approximately two thirds of the ELs with disabilities sample were male. Paralleling findings from other research focused on transition age ELs with disabilities (Trainor et al., 2016, 2019), ELs with disabilities in the current sample were predominantly Hispanic or Latinx (74%) and more likely to live in lower income households than non-ELs with disabilities; 73% live in households with annual incomes below US$25,000, as compared with 33% of non-ELs with disabilities. Spanish was the primary household language for approximately one third of ELs with disabilities as compared with 4% of their peers. ELs with disabilities also were more likely to live in urban settings than their peers (50% vs. 26%). In addition, almost 60% of the parents of ELs with disabilities had not completed high school, as compared with 17% of the parents of non-ELS with disabilities. A comparison of the demographic and disability characteristics of ELs with disabilities and those of other students with disabilities is presented in online supplemental Table S1.

Propensity Score Methodology

We used PSM, a quasi-experimental approach, to address the hypothesis that higher self-determination scores affect postsecondary enrollment rates for ELs with disabilities. PSM techniques (Becker & Ichino, 2002) are increasingly being used to reduce selection bias in estimating treatment effects when randomized controlled trials (RCTs) are not feasible or ethical (Rosenbaum & Rubin, 1983, 1985). When treatment and control groups are not randomly assigned, the treated and non-treated groups may differ in more ways than their self-determination scores (e.g., uneven gender or ethnicity distribution). Any factor that influences both the likelihood of having the treatment (self-determination characteristics) and affects the outcome (postsecondary enrollment) can bias examination of the treatment effect.

PSM is designed to reduce, and ideally eliminate, such biases by creating "statistical twins"—students who are similar on the specified variables (known as covariates) included in the models. The goal is to achieve a valid test of the treatment effect while statistically balancing treatment participants and nonparticipants on measured covariates that might be confounders, thus disentangling confounding effects from treatment effects. In this way, PSM simulates, to the extent possible with survey data, analyses of data from an RCT (Rosenbaum & Rubin, 1983).

The analyses presented here estimated the average treatment effect on students in the treatment condition in the population (PATT) represented by NLTS2 students. We used the "weighting by the odds" analysis approach for complex surveys recommended by DuGoff et al. (2014) to balance the treatment and control groups.

We used logistic regressions to generate scores on the likelihood (propensity) of each student being assigned to the treatment group, based on the variables (covariates) related to the treatment. The dependent variable was each of the three self-determination sub-scale treatment variables, and the independent variables were the covariates. Logistic regressions were based on weighted data using the NLTS2 cross-wave, cross-instrument weight (Valdes et al., 2013), so that findings are nationally representative of ELs with disabilities in the NLTS2 age range and time frame. These regressions generated the estimated probability (i.e., propensity score) that each student belonged to the self-determination treatment group. The survey weights for control students were adjusted by multiplying the NLTS2 weight by the quantity $p/(1-p)$ where p is the propensity score. Propensity scores were truncated at 0.99 to avoid excessively large adjustment factors. Treatment students' survey weights were not adjusted.

These propensity scores then were used to adjust the weights of the control students so that control students were similar to the treatment group on the characteristics included in the analyses. We then ran separate weighted logistic regressions, using the propensity-adjusted survey weights where the dependent variable was one of three postsecondary enrollment outcomes (2-year college, 4-year college, or career/technical education [CTE] program) and the independent variable was one of the three self-determination treatment variables. These models included the dependent and independent variables, the propensity weights, as well as all covariates to further adjust for any differences due to covariates. Regression results generated odds ratios (ORs), which can be interpreted as measures of relative probabilities of enrollment in each of three types of postsecondary schools by the treatment group and comparison group, controlling for the observed covariates and their respective propensity to have experienced treatment. Effect size for the ORs can be calculated using the Cox Index $LOR_{Cox} = \ln(OR)/1.65$ (Cox, 1970).

Measures

Treatment: Self-determination. Self-determination subscale constructs—autonomy, self-realization, and psychological empowerment—were measured in NLTS2 based on items from three of the four subscales of The Arc's Self-Determination Scale, developed and validated by Wehmeyer and associates (e.g., Wehmeyer, 1996, 2000). The self-determination items included in the NLTS2 dataset are a subset of the items in the Arc's Self-Determination Scale. The Arc items included in the NLTS2 interview had been selected by the NLTS2 advisory panel and design team, which included the scale's developer, Wehmeyer. The NLTS2 items were selected from those items in The Arc's Self-Determination Scale with the highest factor loading and face validity to reflect the three conceptual domains noted above. NLTS2 did not include the measurement of self-regulation, the fourth self-determination construct; therefore, a summary self-determination measure could not be created. The autonomy subscale included 15 items. For each of the items, for example, "I plan weekend activities that I like to do," respondents were provided a 4-point Likert-type scale ranging from "Every time I have the chance" to "Not when I have the chance." The six empowerment items asked respondents to indicate which of two contradictory statements best reflected them; for example, "I can get what I want by working hard," or "I need good luck to get what I want." The five self-realization items asked respondents to indicate the extent they agreed with each of several statements, such as, "I like myself," on a Likert-type scale ranging from "never agree" to "always agree." Scale scores were created for the autonomy (0–60), empowerment (0–12), and self-realization scales (0–20). To support examining the effect of higher scores, treatment groups for the autonomy and self-realization scales included those whose score was in the approximate top one quarter. The empowerment scale distribution did not support examining the top quarter because approximately 45% of ELs with disabilities had received the highest empowerment score. The treatment group for the empowerment scale instead were those with the highest score (12), as compared with those with all other scores.

Outcome: Enrollment in postsecondary school. The outcome measures in the analyses were enrollment in each of three types of postsecondary schools—2-year or community college, 4-year college or university, and CTE schools. Enrollment data came from the Waves 2 through 5 post-high school parent/youth interviews/surveys. A dichotomous variable was created for enrollment in each of the types of postsecondary schools. Youth were coded as a 1 = *yes* if they were reported ever to have enrolled in that type of school.

Covariates. Covariate selection is critical to propensity modeling. The primary purpose of propensity methods is to

Table 1. Intervention and Control Balance Statistics on Covariates Before and After Propensity Score Weighting (PSW) for Self-Determination Autonomy Subscale.

		SMD[b]	
Covariates	Mean, %[a]	Pre-PSW	Post-PSW
Gender: male	79.61	0.26[c]	−0.00
Ethnicity: Hispanic/Latinx	83.40	0.33[c]	−0.05
Household income <US$50,000	87.24	–0.00	0.03
Mother's education attainment %≤ high school graduate	91.01	0.50[c]	−0.08
Federal disability category (learning disability comparison)			
Autism	4.6	0.05	0.01
Emotional disturbance	15.31	0.37[c]	0.02
Hearing or visual impairment	2.76	0.08	−0.01
Intellectual disability	8.50	0.07	−0.07
Speech impairment	4.22	–0.01	0.02
Other disability	11.43	0.18	−0.20
Academic credits in 9th/10th grade % of total credits	61.22	–0.42[c]	0.17
GPA in 9th/10th grades academic courses	2.24	0.26[c]	–0.15
Unweighted sample size	230		

Note. Data are from the U.S. Department of Education, National Center for Special Education Research, National Longitudinal Transition Study-2. Tables reporting intervention and control balance statistics on covariates for empowerment and self-realization scales are available on request. Sample size rounded to nearest 10, as required by the Institute of Education Sciences, U.S. Department of Education, for restricted-use datasets. GPA = grade point average. % = percentage.
[a]Post-PSW intervention mean. [b]Pre-PSW standardized mean difference (SMD) is calculated as the intervention mean minus the control mean (both means calculated using survey weights), with the difference divided by the pooled standard deviation. The Post-PSW SMD is calculated as the intervention mean (calculated using survey weights) minus the control mean (calculated using PSW-adjusted survey weights), with the difference divided by the pooled standard deviation (survey weights), with the difference divided by the pooled standard deviation. [c]SMD is above What Works Clearinghouse 0.25 cutoff for baseline equivalence for quasi-experimental studies.

achieve the optimal balance on covariates (Caliendo & Kopeing, 2008), so that those with higher versus lower levels of the treatment (self-determination) are similar on other factors that are related to self-determination and postsecondary enrollment. Covariate selection was informed by the Causal Agency Theory, the Framework for Research in Transition (Trainor et al., 2020), and prior research. Covariates, shown in Table 1, are described below.

Individual and household demographic factors have been associated with differences in self-determination characteristics and postsecondary outcomes for young adults with disabilities (Joshi & Bouck, 2017; Newman et al., 2021; Shogren et al., 2007; Wagner et al., 2007). Demographic covariates came from the Wave 1 parent interview/survey. Categorical variables were dichotomized to support balanced treatment and comparison groups on all covariates and were included in the models as the following dichotomous variables: youth's gender (1 = male, 0 = female), ethnicity (1 = Hispanic/Latinx, 0 = other than Hispanic/Latinx), household income (1 = <$50,000, 0 = ≥$50,000), and mother's education (1 = high school graduate/GED or less, 0 = all other education categories). In initial models, based on covariate frequencies, mother's education was dichotomized as less than a high school graduate vs. high school graduate or higher and income was dichotomized as $25,000 or less vs. more than $25,000. When these initial models were run, several covariates in the autonomy model remained above the cutoff for equivalence in treatment and control groups. Education and income variables were then revised to the current versions indicated above. The propensity results in terms of the relationship of each of the three self-determination scales with enrollment in each type of postsecondary school remained the same, independent of the way these two variables were dichotomized.

Research has highlighted the often dramatic differences in the experiences of students with different primary disabilities and has demonstrated that disability type can shape programs and services in which young adults participate and their postsecondary school outcomes (e.g., Levine et al., 2004; Newman et al., 2011; Shogren et al., 2007). School districts provided participants' federally defined primary disability. In the propensity models, students with hearing impairments or visual impairments were combined into a sensory impairment category, and several low incidence disability categories, including multiple disabilities, traumatic brain injuries, orthopedic and other health impairments, and deaf/blindness were combined in an "other disability" category, to better support covariate balancing.

High school preparation and performance can be important influences for postsecondary outcomes (Long et al., 2012). Academic performance was measured on the basis of students' high school transcript grade point average (GPA) in academic coursework in Grades 9 and 10. Academic preparation was measured on the basis of students' high school transcripts, as indicated by the percentage of overall credits earned in academic-general education courses.

Missing data rates ranged from 0 for 14 of the variables included across the nine models to approximately 3% for household income, 8% for mother's education attainment, and 13% for both the 9th/10th grade academic course-taking and GPA variables. Online supplemental Table S2

Table 2. PATT Effect of Self-Determination on Postsecondary School Enrollment for English Learner Students With Disabilities.

	Postsecondary school type								
	2-year or community college			4-year college or university			CTE school		
Intervention	Intervention group[a] (%)	Adjusted control group[b] (%)	Propensity-adjusted OR[c] (95% CI)	Intervention group[a] (%)	Adjusted control group[b] (%)	Propensity-adjusted OR[c] (95% CI)	Intervention group[a] (%)	Adjusted control group[b] (%)	Propensity-adjusted OR[c] (95% CI)
Self-determination subscale scores									
Autonomy	76.53	17.30	15.6*** [3.89, 62.39]	6.69	7.80	0.88 [0.20, 3.92]	1.10	11.00	–0.09* [0.01, 0.64]
Empowerment	36.62	20.50	2.25 [0.31, 16.35]	7.70	1.10	7.48** [1.86, 30.17]	15.52	60.50	–0.12* [0.02, 0.76]
Self-realization	36.08	36.08	1.00 [0.15, 6.79]	7.50	6.90	1.09 [0.20, 6.09]	2.43	38.40	–0.04** [0.00, 0.37]

Note. Data are from the U.S. Department of Education, National Center for Special Education Research, National Longitudinal Transition Study-2 (NLTS2). Self-determination subscales from The Arc's Self-Determination Scale (Wehmeyer, 2000). PATT= population average treatment effect on the treated; CTE = Career/Technical Education.

[a]Intervention group percentage, using survey weights. [b]Percentage positive for a control group that would yield the propensity adjusted *OR* if it matched the intervention group on all covariate means; calculated 100 * Pt/(*OR* [1 − Pt] + Pt), where Pt is the survey-weighted percentage of the intervention group with a positive outcome and *OR* is the propensity and covariate adjusted *OR*. [c]Effect size for dichotomous outcomes can be calculated using the Cox Index: LOR_{Cox} = ln(OR)/1.65, where *LOR* is the logged odds ratio, ln() is the natural logarithm function, and *OR* is the odds ratio. D. R. Cox, 1970, *Analysis of Binary Data*, Chapman & Hall/CRC.

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

presents the missingness rates for variables in each model. Missing data were imputed 20 times using Stata's Imputation by Chained Equations procedure (Royston et al., 2009). All analysis variables were imputed to avoid bias associated with listwise deletion and to capture the information contained in the correlation between covariates and the outcome and treatment variables; however, as recommended (White et al., 2011), we did not use imputed values for the outcome or treatment in the analyses.

Adequacy of Adjustment for Treatment and Control Differences

To ensure that PSM created balanced intervention and comparison groups, standardized mean differences (SMDs) between the two groups on each covariate were compared before and after propensity score weighting. What Works Clearinghouse (WWC, 2020) established a 0.25 cutoff for baseline equivalence for quasi-experimental studies, a standard also supported by other analysts (e.g., Ho et al., 2007). Before propensity score weighting, the SMDs were above the WWC cutoff for six covariates in the autonomy model (Table 1) and four covariates in the empowerment model. All covariates were below WWC cutoff in the self-realization model. Tables reporting treatment and control balance statistics on covariates for empowerment and self-realization scales are available on request. After propensity score weighting, all SMDs were below the WWC cutoff in all models, indicating treatment and comparison groups were balanced on the covariates in all models and propensity modeling was warranted.

Sensitivity analysis. Unobserved confounding is a concern in nonexperimental studies; the propensity score approach adjusts for observed covariates but does not necessarily balance on unobserved factors. Bias may arise if there is unobserved confounding, that is, if an unmeasured factor is correlated with both self-determination and postsecondary school enrollment. A sensitivity analysis (Lin et al., 1988) was conducted to determine how strongly a single unmeasured variable would need to be associated with both self-determination behaviors and postsecondary enrollment, if that variable had been included as a covariate in the propensity score analysis, to render the effect of the self-determination variable statistically nonsignificant. Such a variable would need to have an *OR* of 5.4 with both the dependent and treatment variable in the 4-year college models and an OR of 13.8 in the 2-year college models, both of which are relatively high hurdles. This suggests that the unobserved confounder would need to be very powerful before it would render the current findings not statistically significant.

Results

Propensity-adjusted results supported the hypothesis that components of self-determination affect college enrollment (Table 2). Findings indicate that ELs with disabilities with higher autonomy scores were more likely to enroll in 2-year

colleges, and those with higher empowerment scores were more likely to enroll in 4-year colleges.

Effect of Self-Determination Components on 2-Year College Enrollment

ELs with disabilities with higher autonomy scores were more likely to enroll in a 2-year or community college (OR = 15.60, $p < .001$). That is, of those who had higher autonomy scores, 77% had enrolled in a 2-year college, as compared with a propensity-adjusted enrollment rate of 17% for those who had lower scores (where the control group matched the treatment group on all covariate means). Empowerment and self-realized behaviors were not significantly related to enrollment in 2-year colleges.

Effect of Self-Determination Components on 4-Year College Enrollment

English learners with disabilities who had higher empowerment scores were more likely to enroll in 4-year colleges ($OR = 7.48$, $p < .01$). Approximately 8% of those with higher empowerment scores had enrolled in 4-year colleges, as compared with a propensity-adjusted enrollment rate of 1% for those with lower empowerment scores. The remaining two self-determination measures—autonomy and self-realization—were not significantly related to 4-year college enrollment.

Effect of Self-Determination Components on CTE School Enrollment

In contrast to the positive relationship of aspects of self-determination to 2- or 4-year college enrollment, higher levels of the three self-determined behaviors—autonomy (OR = 0.09, $p < .05$); empowerment (OR = −0.12, $p < .05$); and self-realization (OR = −0.04, $p < .01$)—were negatively related to CTE program enrollment. For example, 1% of students with higher autonomy scores enrolled in CTE schools, as compared with a propensity-adjusted enrollment rate of 11% for those with lower autonomy scores.

Discussion

The current study confirmed the importance of the components of self-determination (i.e., autonomy, empowerment, and self-realization) and identified associated positive effects on 2- or 4-year college enrollment for ELs with disabilities, extending the research base, both by focusing on these dually identified students and by using a quasi-experimental propensity modeling approach. Findings indicate that ELs with disabilities with higher autonomy scores were more likely to enroll in 2-year colleges, and those with higher empowerment scores were more likely to enroll in 4-year colleges. Although a definitive conclusion about these positive associations requires further research, the relationship between empowerment to 4-year colleges may reflect a more advanced understanding of how one's strengths and preferences foster decision-making and the extent to which a sense of self-efficacy will evidence a desired outcome. Enrolling in a 2-year college may seem more manageable to an applicant who is still learning or developing a sense of the connections between their autonomy and the desired outcomes. These findings align with other studies that described the positive relationship of components of self-determination, particularly autonomy and empowerment, and postsecondary outcomes for students with disabilities (Getzel & Thoma, 2008; Ju et al., 2017; Petcu et al., 2017; Shogren & Shaw, 2016).

In contrast to the positive relationship with 2- and 4-year colleges, this study identified a negative relationship between self-determined behaviors and enrollment in CTE programs, which is consistent with Berry et al. (2012), whose study of youth receiving Supplemental Security Income benefits was also based on NLTS2 data. In contrast, Petcu et al. (2017) found a positive relationship between autonomy and CTE enrollment for the broader NLTS2 sample with postsecondary data. These conflicting findings may be attributed to differences in study samples and/or methodology and they are difficult to interpret without further research.

Prior research based on NLTS 2012 data indicated that ELs with disabilities were less likely to act autonomously or report empowerment-related behaviors than other students with disabilities or students in the general population (Newman et al., 2021); this is concerning because these two components of self-determination, as the current analyses demonstrated, affect postsecondary education enrollment. Considering this in the context of the increasing importance of postsecondary education for all emerging adults, the current study's findings illustrate the importance of supporting the self-determined behaviors of this dually identified population, particularly for those who have a transition goal of attending postsecondary school.

Implications for Practitioners

Promoting the self-determination of secondary students with disabilities has long been considered a best practice in transition planning (Ju et al., 2017; Wehmeyer et al., 2003). Research has demonstrated that self-determination can be enhanced and developed through advocacy, support, encouragement, and instruction, particularly if the instructional curriculum targets multiple aspects of self-determination over a longer time period (Burke et al., 2018; Martin et al., 2006; Wehmeyer et al., 2012, 2013). As Shogren and Shaw (2016), Shogren et al. (2018) noted, however, ecological factors related to school and home contexts, in addition to

individual factors, affect the development of students' self-determination. Shogren and colleagues' work suggests that promoting self-determination for ELs with disabilities requires teachers to be very knowledgeable about students' and their families' attitudes and skills related to the components of autonomy, empowerment, and self-realization.

Although culturally sustaining practices are important across groups of students with and without disabilities, this is an especially salient feature of effective instruction for ELs with disabilities who are members of multiple historically marginalized groups for whom participation in school processes is enhanced with the implementation of culturally sustaining communication and instruction (Paris, 2012; Waitoller & King Thorius, 2016). Transition professionals' cross-cultural communication competence, their ability to share information or cultural capital in culturally and linguistically appropriate ways with students and families, minimizing biases and maintaining asset-based approaches to education is critical (Trainor, 2010). Fostering self-determination requires an appreciation of students' backgrounds and the experiences of their family and communities and an expanded conceptualization of what it means to be self-determined (Paris, 2012). Teachers need to get to know the students and families with whom they are working to understand what the most salient aspects of their identities are the most important during the transition planning process. For example, some Hispanic families may value interdependent/collective approaches to self-determination (Shogren, 2012). Professional development may help strengthen educators' culturally responsive practices focused on fostering self-determination (Gothberg et al., 2019).

Designing and evaluating culturally sustaining interventions to promote self-determination also means supporting the practices of people with disabilities and their families while sharing information about the dominant U.S. context and expectations. As Chirkov and colleagues (2003) explained, locating oneself on a continuum of interdependence/independence reflects autonomy. For example, ELs with disabilities may desire to pursue postsecondary education but do so while living at home to pool economic resources and preserve close familial relationships or align with parental expectations. To respond in a culturally sustaining way, teachers would have knowledge of the goals of the student and family and provide support for their vision of college attendance rather than the more predominant view that, at age 18, young adults express independence by moving out of their parent home, and/or pursue college through on-campus residency often depicted in American media.

Components of self-determination have been linked to student involvement in setting transition-related goals (Martin et al., 2006; Shogren & Shaw, 2016; Williams-Diehm et al., 2008). Despite similar rates of transition planning meeting attendance, ELs with disabilities and their families were less likely than other students with disabilities to report involvement in creating transition plan goals and more likely to report that the goals were mostly generated by teachers (Trainor et al., 2019). Setting postsecondary goals may be difficult for a student with a disability who is experiencing poverty and whose parents have limited experience with postsecondary education and federal financial aid programs. For example, Trainor et al. (2019) found that parents of ELs with disabilities identified a need for more information about college financial aid from teachers. Teachers can provide enhanced self-determination opportunities by understanding both the strengths and the barriers students and families are experiencing, by building relationships with families, increasing their understanding of parents' and students' roles and responsibilities, views on disability, and expectations of postsecondary attendance. Through relationship building, entailing mutual trust and respect, teachers can provide additional supports and accommodations to develop students' self-determination skills, as well as structured opportunities to practice these skills, particularly within the transition planning context.

ELs differ in the extent they identify with and are fluent in English and their home languages. Within language proficiencies, they also range in strengths and needs in linguistic skills associated with receptive and expressive language and with modality (e.g., reading, writing, listening comprehension, and speaking). Their identification with and response to dominant cultural and linguistic practices, influenced by a host of identity factors, also varies. Although research has identified a range of student characteristics significantly related to the self-determination of ELs with disabilities, including disability category, age, gender, and student and family expectations (Newman et al., 2021), providing guidance for schools to better target, design, and implement supportive and effective practices to promote self-determination of ELs with disabilities remains in need of further study. It is particularly important that transition professionals consider both individual (e.g., student/family) and societal (e.g., community/school) factors when selecting, implementing, and evaluating self-determination interventions for ELs with disabilities.

Implications for Researchers

Current findings demonstrate the influence of aspects of self-determined behavior on postsecondary enrollment for ELs with disabilities. Students need to complete postsecondary education programs to fully benefit from their postsecondary education (Newman et al., 2011). Given the differentiated effects of all three components of self-determination on enrollment by postsecondary education type, it is important to better understand why empowerment was the component most likely to lead to a 4-year college and why autonomy was more likely to lead to a 2-year college. Similarly, the negative relationship between all three

components and the enrollment in CTE programs needs additional research attention. It may be that students and families do not know that CTE programs will develop into a career path.

The current study used propensity modeling to examine whether self-determination components had an effect on postsecondary enrollment, but not the mechanism by which the components affected the outcome. Propensity methods also can be used to examine mediators of treatment effects, in particular measures to potentially identify individuals for whom components of self-determination are more or less effective.

Future research should also explore the relationship of self-determination with postsecondary persistence and completion outcomes for these dually identified students. In addition, when designing and evaluating interventions to promote self-determination, consideration should particularly be given to EL status, including cultural and language preferences, as well as the intersectionality of language, culture, disability, and socioeconomic status. The relationship between self-determination and postsecondary education for ELs with disabilities also should be explored qualitatively to support a more in-depth understanding of the factors that may mediate this relationship, particularly those related to language proficiencies in English and home languages. Strengths in language and bilingualism are associated with numerous fields of postsecondary education study and career opportunities. Because dominant cultural beliefs about disability, postsecondary education, and career planning in the United States may be unfamiliar to immigrant families, understanding the range of cultural beliefs and practices around futures planning and adulthood for these young adults with disabilities and their families is critical to developing a set of preferred practices that are both culturally sustaining and effectively meeting disability-related strengths and needs.

Limitations

This study has provided evidence of the effect of components of self-determined behaviors on 2- or 4-year college enrollment for ELs with disabilities. Nonetheless, it has the following limitations. As a secondary analysis, this study was constrained by the NLTS2 design and the items available in the data set. Respondents were given the option of responding in English or Spanish to the surveys that included the self-determination items. The minority of students in the sample who spoke another language might have had trouble answering the questions in a language they were in the midst of learning. In addition, NLTS2's version of The Arc's Self-Determination Scale included a subset of items from each of three of the four subscales in The Arc's Self-Determination Scale, rather than the full scales. The fourth subscale, self-regulation, was not measured in NLTS2; therefore, no overall self-determination score could be constructed. The self-determination and enrollment data were based on student self-report, with no opportunity to document self-determined behavior at school or home, or to ascertain postsecondary enrollment from external records.

In addition, it is important to acknowledge the age of the NLTS2 data as a limitation because outcomes may have changed over time. Although the NLTS2 data set is the only available data set with postsecondary education outcomes for a nationally representative sample of ELs with disabilities, some of these data now are more than a decade old and may no longer be fully reflective of the current postsecondary experiences of ELs with disabilities. When postsecondary education outcome data become available for the NLTS 2012 study, it will be important to replicate current analyses, based on the more recent dataset.

Finally, unobserved confounding is a concern in studies such as this. The propensity score approach adjusts for observed covariates but does not necessarily balance on unobserved factors. Bias may arise if an unmeasured factor was correlated with both receipt of self-determination and postsecondary enrollment. However, sensitivity analyses (Lin et al., 1988) indicate that results were unlikely to overstate effects and that an unobserved confounder would need to be very powerful before it would render the current findings not statistically significant.

Conclusion

The current study's results support the hypothesis that components of self-determination affect postsecondary school enrollment for ELs with disabilities. Those with higher autonomy scores were more likely to enroll in 2-year colleges, and ELs with disabilities with higher empowerment scores were more likely to enroll in 4-year colleges. However, prior research found that ELs with disabilities are less likely to act autonomously or report empowerment-related behaviors than other students with disabilities or students in the general population. Considering the increasing importance of postsecondary education, this study's findings demonstrate the importance of promoting the self-determined behaviors of these students, dually identified as ELs with disabilities.

Declaration of Conflicting Interests

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Supplemental Material

Supplemental material is available on the *Remedial and Special Education* webpage with the online version of the article.

Note

1. We recognize the *English learner* term as a label that is, arguably, deficit oriented; however, we use the term here to maintain consistency with how respondents were asked to identify these students in the NLTS2 study.

References

Becker, S. O., & Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. *Stata Journal*, *2*(4), 358–377.

Berry, H. G., Ward, M., & Caplan, L. (2012). Self-determination and access to postsecondary education in transitioning youths receiving supplemental security income benefits. *Career Development and Transition for Exceptional Individuals*, *35*(2), 68–75.

Burke, K. M., Raley, S. K., Shogren, K. A., Hagiwara, M., Mumbardo-Adam, C., Uyanik, H., & Behrens, S. (2018). A meta-analysis of interventions to promote self-determination for students with disabilities. *Remedial and Special Education*, *1*, 1–13.

Burr, E., Haas, E., & Ferriere, K. (2015). *Identifying and supporting English learner students with learning disabilities: Key issues in the literature and state practice* (REL 2015-086). Institute of Education Sciences, U.S. Department of Education.

Caliendo, M., & Kopeing, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, *22*(1), 31–72.

Cavendish, W. (2017). The role of gender, race/ethnicity, and disability status on the relationship between student perceptions of school and family support self-determination. *Career Development and Transition for Exceptional Individuals*, *40*(2), 113–122. https://doi.org/10.1177/2165143416629359

Chirkov, V., Kim, Y., Ryan, R. M., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on internationalization of cultural orientations and well-being. *Journal of Personality and Social Psychology*, *84*, 97–110. https://doi.org/10.1037/0022-3514.84.1.97

Chou, Y., Wehmeyer, M. L., Palmer, S., & Lee, J. H. (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), 124–132.

Cobb, B., Lehmann, J., Newman-Gonchar, R., & Morgan, A. (2009). Self-determination for students with disabilities: A narrative metasynthesis. *Career Development for Exceptional Individuals*, *32*(2), 108–114.

Cox, D. R. (1970). *Analysis of binary data*. Chapman & Hall/CRC.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Plenum.

DuGoff, E. H., Schuler, M., & Stuart, E. A. (2014). Generalizing observational study results: Applying propensity score methods to complex surveys. *Health Services Research*, *49*(1), 284–303. https://doi.org/10.1111/1475-6773.12090

Getzel, E. E., & Thoma, C. A. (2008). Experiences of college students with disabilities and the importance of self-determination in higher education settings. *Exceptional Individuals*, *31*(2), 77–84.

Gothberg, J. E., Green, G., & Kohler, P. D. (2019). District implementation of research -based practices for transition planning with culturally and linguistically diverse youth with disabilities and their families. *Career Development for Exceptional Individuals*, *42*(2), 77–86. https://doi.org/10.1177/2165143418762794

Great Schools Partnership. (2013, August 29). *The glossary of education reform*. https://www.edglossary.org/english-language-learner/

Ho, D., Imai, K., King, G., & Stuart, E. A. (2007). Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. *Political Analysis*, *15*(3), 199–236.

Hogan, A., & Roberts, B. (2015, December). *Occupational employment projections to 2024. Monthly Labor Review*. U.S. Department of Labor, U.S. Bureau of Labor Statistics. https://doi.org/10.21916/mlr.2015.49

Hussar, B., Zhang, J., Hein, S., Wang, K., Roberts, A., Cui, J., Smith, M., Bullock Mann, F., Barmer, A., & Dilig, R. (2020). *The condition of education 2020* (NCES 2020-144). National Center for Education Statistics, U.S. Department of Education.

Javitz, H., & Wagner, M. (2003). *Analysis of potential bias in the sample of local education agencies (LEAs) in the National Longitudinal Transition Study-2 (NLTS2)*. SRI International.

Javitz, H., & Wagner, M. (2005). *Analysis of potential bias in the Wave 1 and Wave 2 respondents to the National Longitudinal Transition Study-2 (NLTS2)*. SRI International.

Joshi, G. S., & Bouck, E. G. (2017). Examining postsecondary education predictors and participation for students with learning disabilities. *Journal of Learning Disabilities*, *50*(1), 3–13. https://doi.org/10.1177/0022219415572894

Ju, S., Zeng, W., & Landmark, L. J. (2017). Self-determination and academic success of students with disabilities in postsecondary education: A review. *Journal of Disability Policy Studies*, *28*(3), 180–189.

Levine, P., Marder, C., & Wagner, M. (2004). *Services and supports for secondary school students with disabilities: A special topic report of findings from the NLTS2*. SRI International. www.nlts2.org/reports/2004_05/nlts2_report_2004_05_complete.pdf

Lin, D., Psaty, B., & Kronmal, R. (1988). Assessing the sensitivity of regression results to unmeasured confounders in observational studies. *Biometrics*, *54*(3), 948–963.

Liu, A. Y., Lipscomb, S., & Johann, A. (2017). *The characteristics and experiences of English learner students with disabilities in secondary school: Evidence from the National Longitudinal Transition Study 2012*. (Working Paper No. 56). Mathematica Policy Research.

Long, M. C., Conger, D., & Iatarola, P. (2012). Effects of high school course-taking on secondary and postsecondary success. *American Education Research Journal*, *49*(2), 285–322.

Martin, J. E., Van Dycke, J. L., Christensen, W. R., Greene, B. A., Gardner, J. E., & Lovett, D. L. (2006). Increasing student participation in IEP meetings: Establishing the Self-Directed IEP as an evidenced-based practice. *Exceptional Children*, *72*(3), 299–316.

Mazzotti, V. L., Rowe, D. A., Kwiatek, S., Voggt, A., Chang, W., Fowler, C. H., Poppen, M., Sinclair, J., & Test, D. W. (2021). Secondary transition predictors of postschool success: An update to the research base. *Career Development and Transition for Exceptional Individuals*, *44*(1), 47–64. https://doi.org/10.1177/2165143420959793

National Center for Education Statistics. (2020). *English language learners in public schools. The condition of education*. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. https://nces.ed.gov/programs/coe/indicator_cgf.asp

Newman, L., Garcia, E., Trainor, A., & Chong, M. (2021). National picture of the self-determination characteristics of secondary school English learners with disabilities. *Career Development and Transition for Exceptional Individuals*, *44*, 216–228. https://doi.org/10.1177/2165143420982923

Newman, L., Wagner, M., Knokey, A., Marder, C., Nagle, K., Shaver, D., & Wei, X. (2011). *The post-high school outcomes of young adults with disabilities up to 8 years after high school: A report from NLTS2* (NCSER 2011-3005). SRI International.

Paris, D. (2012). Culturally sustaining pedagogy: A needed change in stance, terminology, and practice. *Educational Researcher*, *41*(3), 93–97. https://doi.org/10.3102/0013189X12441244

Petcu, S. D., Van Horn, M. L., & Shogren, K. A. (2017). Self-determination and the enrollment in and completion of postsecondary education for students with disabilities. *Career Development and Transition for Exceptional Individuals*, *40*(14), 225–234.

Rodriguez, R. J., & Cavendish, W. (2013). Differences in the relationship between family environments and self-determination among Anglo, Latino, and female students with disabilities. *Career Development and Transition for Exceptional Individuals*, *36*(3), 152–162. https://doi.org/10.1177/2165143412461524

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, *70*(1), 41–55.

Rosenbaum, P. R., & Rubin, D. B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician*, *39*(1), 33–38.

Royston, P., Carlin, J. B., & White, I. R. (2009). Multiple imputation of missing values: New features for Mim. *Stata Journal*, *9*(2), 252–264.

Shogren, K. A. (2011). Culture and self-determination: A synthesis of the literature and directions for future research and practice. *Career Development for Exceptional Individuals*, *34*(2), 115–127. https://doi.org/10.1177/0885728811398271

Shogren, K. A. (2012). Hispanic mothers' perceptions of self-determination. *Research & Practice for Persons with Severe Disabilities*, *37*(3), 170–184. https://doi.org/https://doi.org/10.2511/027494812804153561

Shogren, K. A., Kennedy, W., Dowsett, C., Garnier Villarreal, M., & Little, T. D. (2014). Exploring essential characteristics of self-determination for diverse students using data From NLTS2. *Career Development and Transition for Exceptional Individuals*, *37*(3), 168–176. https://doi.org/https://doi.org/10.1177/2165143413486927

Shogren, K. A., Lee, J., & Panko, P. (2017). An examination of the relationship between postschool outcomes and autonomy, psychological, empowerment, and self-realization. *The Journal of Special Education*, *5*(2), 115–124.

Shogren, K. A., & Shaw, L. A. (2016). The role of autonomy, self-realization, and psychological empowerment in predicting outcomes for youth with disabilities. *Remedial and Special Education*, *37*(1), 55–62.

Shogren, K. A., Shaw, L. A., Raley, S. K., & Wehmeyer, M. L. (2018). Exploring the effect of disability, race-ethnicity, and socioeconomic status on scores on the self-determination inventory: Student report. *Exceptional Children*, *85*(1), 10–27. https://doi.org/https://doi.org/10.1177/0014402918782150

Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Forber-Pratt, A. J., Little, T. J., & Lopez, S. (2015). Causal agency theory: Reconceptualizing a functional model of self-determination. *Education and Training in Autism and Developmental Disabilities*, *50*(3), 251–263.

Shogren, K. A., Wehmeyer, M. L., Palmer, S. B., Soukup, J. H., Little, T. D., Garner, N., & Lawrence, M. (2007). Examining individual and ecological predictors of the self-determination of students with disabilities. *Exceptional Children*, *73*(4), 488–509.

SRI International. (2000). *National Longitudinal Transition Study-2 (NLTS2) sampling plan*.

Trainor, A. A. (2005). Self-determination perceptions and behaviors of diverse students with LD during the transition planning process. *Journal of Learning Disabilities*, *38*(3), 233–249. https://doi.org/10.1177/00222194050380030501

Trainor, A. A. (2007). Perceptions of adolescent girls with LD regarding self-determination and postsecondary transition planning. *Learning Disability Quarterly*, *30*(1), 31–45. https://doi.org/10.2307/30035514

Trainor, A. A. (2010). Reexamining the promise of parent participation in special education: An analysis of cultural and social capital. *Anthropology & Education Quarterly*, *41*(3), 245–263. https://doi.org/10.1111/j.1548-1492.2010.01086

Trainor, A. A., Carter, E. W., Karpur, A., Martin, J., Mazzotti, V., Morningstar, M. E., Newman, L. A., & Rojewski, J. W. (2020). A framework for research in transition: Identifying important areas and intersections for future research. *Career Development and Transition for Exceptional Individuals*, *43*(1), 5–17. https://doi.org/10.1177/2165143419864551

Trainor, A. A., Murray, A., & Kim, H. (2016). English learners with disabilities in high school: Population characteristics,

transition programs, and postschool outcomes. *Remedial and Special Education*, *37*(3), 146–158. https://doi.org/10.1177/0741932515626797

Trainor, A. A., Newman, L., Garcia, E., Woodley, H., Traxler, R. E., & Deschene, D. N. (2019). Postsecondary education-focused transition planning experiences of English learners with disabilities. *Career Development and Transition for Exceptional Individuals*, *42*(1), 43–55.

U.S. Department of Education. (2019). *Our nation's English learners: What are their characteristics?* https://www2.ed.gov/datastory/el-characteristics/index.html

Valdes, K., Godard, P., Williamson, C., Van Campen, J., McCracken, M., & Jones, R. (2013). *National Longitudinal Transition Study-2 (NLTS2) Data documentation and dictionary*. SRI International.

Wagner, M., Newman, L., Cameto, R., Levine, P., & Marder, C. (2007). *Perceptions and expectations of youth with disabilities: A special topic report of findings from the National Longitudinal Transition Study-2* (NCSER 2007-3006). SRI International.

Waitoller, F. R., & King Thorius, K. A. (2016). Cross-Pollinating culturally sustaining pedagogy and universal design for learning: Toward an inclusive pedagogy that accounts for dis/ability. *Harvard Educational Review*, *86*(3), 366–389. https://doi.org/10.17763/1943-5045-86.3.366

Wehmeyer, M. L. (1992). Self-determination and the education of students with mental retardation. *Education and Training in Mental Retardation*, *27*(4), 302–314.

Wehmeyer, M. L. (1996). Student self-report measure of self-determination for students with cognitive disabilities. *Education and Training in Mental Retardation and Developmental Disabilities*, *31*(4), 282–293.

Wehmeyer, M. L. (1997). Student-directed learning and self-determination. In M. Agran (Ed.), *Student-directed learning: Teaching self-determination skills* (pp. 28–59). Brooks/Cole Publishing.

Wehmeyer, M. L. (2000). *The Arc's Self-Determination Scale: Procedural guidelines* (Rev. ed.). The Arc of the United States.

Wehmeyer, M. L. (2004). Beyond self-determination: Causal agency theory. *Journal of Developmental and Physical Disabilities*, *16*(4), 337–359.

Wehmeyer, M. L., Abery, B., Mithaug, D. E., & Stancliffe, R. J. (2003). *Theory in self-determination: Foundations for educational practice*. Charles C. Thomas Publisher.

Wehmeyer, M. L., Palmer, S. B., Shogren, K. A., Williams-Diehm, K., & Soukup, J. H. (2013). Establishing a causal relationship between interventions to promote self-determination and enhanced student self-determination. *The Journal of Special Education*, *46*(4), 195–210.

Wehmeyer, M. L., Shogren, K. A., Palmer, S. B., Williams-Diehm, K., Little, T. D., & Boulton, A. (2012). Impact of the Self-Determined Learning Model of Instruction on student self-determination: A randomized-trial placebo control group study. *Exceptional Children*, *78*(2), 135–153.

What Works Clearinghouse. (2020). *What Works Clearinghouse standards handbook* (Version 4.1). Institute for Education Sciences, U.S. Department of Education.

White, I. R., Royston, P., & Wood, A. M. (2011). Multiple imputation using chained equations: Issues and guidance for practice. *Statistics in Medicine*, *30*(4), 377–399.

Williams-Diehm, K., Wehmeyer, M. L., Palmer, S., Soukup, J. H., & Garner, N. (2008). Self-determination and student involvement in transition planning: A multivariate analysis. *Journal on Developmental Disabilities*, *14*(1), 25–36.

Zhang, D. (2005). Parent practices in facilitating self-determination skills: The influences of culture, socioeconomic status, and children's special education status. *Research and Practice for Persons with Severe Disabilities*, *30*(3), 154–162.

Zimmerman, M. A. (1990). Toward a theory of learned hopefulness: A structural model analysis of participation and empowerment. *Journal of Research in Personality*, *24*(1), 71–86.